

Ecuador Mahi-mahi longline

Announcement Comment Draft Report

Conformity Assessment Body (CAB)	Kiwa España SLU
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Fishery client	Propemar, Frigolab San Mateo, Transmarina, Fresh Fish del Ecuador, and Frigolandia
Assessment type	Initial Assessment
Date	April 20th 2023

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2 Glossary

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

Concepts and terms:

ACDR	Announcement Comment Draft Report
BMSY	Biomass at MSY
Blim	level of biomass that should be avoided considering that beyond such limits, the sustainability of
	the stock may be in danger
Bloss	Lowest biomass of the time series
B _{target}	Management objective based on a level of biomass that should be achieved and maintained;
BRP	Biological Reference Points
CAB	Conformity Assessment Body
CIT	Inter-American Convention for the Protection and Conservation of Sea Turtles
CMCDP	Fisheries Landing Control and Monitoring Certificates
CoC	Chain of Custody
CPC	Contracting Party Convention
CPUE	Catch per Unit Effort
DD	Data Deficient
EASI-Fish	Ecological Assessment for the Sustainable Impacts of Fisheries
FF7	Exclusive Economic Zone
FMS	Electronic Monitoring System
FPO	Eastern Pacific Ocean
FTP	Endangered Threatened and Protected
FDR	Einal gelot, metalenet and releted
FMEY	Final Draw Roport
Ftorgot	Management objective based on a fishing mortality rate that should be achieved and maintained
FCP	(MSC) Fisheries Certification Process
HCRs	Harvest Control Rules. Decision rules that aim to achieve the target reference point and avoid
nons	the limit reference point by specifying pre-agreed management actions when $B_{TMPSHUD} = T_{TMPSHUD}$
	or Billing are breached
IUU	Illegal, underreported and unregulated (fisheries)
LL-DOL	Longline used by the Ecuadorian fleet for targeting dolphinfish
LLTBS	Longline used by the Ecuadorian fleet for targeting tunas, billfishes and sharks.
	National Fisheries and Aquaculture Law of Ecuador
IRP	Limit Reference Point
MCS	Monitoring Control and Surveillance
Moll	Memorandum of Linderstanding
MSE	Management Strategy Evaluation
MSY	Maximum Sustainable Yield
PAN	National Action Plan (Plan de Acción Nacional)
PCDR	Public Comment Draft Report
PCR	Public Certification Report
PRI	Point where Recruitment would be Impaired
Rec	Recommendation
Res	Resolution
SMSV	Snawning biomass at MSY level
Slim	Level of the snawning biomass that should be avoided considering that beyond such limits the
- Omm	sustainability of the stock may be in danger
SBR	Spawning Biomass Ratio
TAC	Total Allowable Catch
	Unit of Assessment
	Unit of Certification
VME	Vulnerable Marine Ecosystem
VMS	Vessel Monitoring System
YPR	Yield-per-recruit

Institutions, organization, bodies, agreements conventions and programmes: AAARCUD IPA
Asociación de Armadores Artesanales para el Consumo Humano del Puerto de Paita



ACAP	Agreement on the Conservation of Albatrosses and Petrels		
APADEXP	Asociación de Pescadores Artesanales dedicados a la extracción de pota, perico y otros.		
0	Parachique-La Bocana		
APAMARP	Asociación de Pescadores Artesanales Mar de Paita.		
Α			
ASOEXPE	Asociación de Exportadores de Pesca Blanca		
BLA			
ASOMAN	Asociación de Producción Pesquera de Armadores de Manta		
BYC	IATTC-Working Group on bycatch		
CITES	Convention on International Trade in Endangered Species		
CMS	Convention on Migratory Species		
DCP	Ecuadorian Fisheries Control Directorate		
DGPA	General Directorate of Artisanal fisheries		
DGSFS	General Directorate of Supervision, Control and Sanctions		
DPPA	Fisheries and Aquaculture Policies Directorate		
DVMPA	Vice-Ministerial Office of Fisheries and Aquaculture		
EBWG	IATTC-Permanent Working Group on Ecosystem and bycatch		
FAO	Food and Agriculture Organization of the United Nations		
FENACOP	Federación Nacional de Cooperativas Pesqueras del Ecuador		
EC			
FIUPAP	Federación de Integración y Unificación de los Pescadores Artesanales del Perú		
FONDEPE	Fondo Nacional de Desarrollo Pesquero-Perú		
S			
	Inter-American Tropical Tuna Commission		
	Instituto del Mar del Peru		
	Investigación de Acuicultura y Pesca del Ecuador		
MPCEIP	Winisterio de Produccion, Comercio Exterior, Inversiones y Pesca (Winistry of Production,		
Mec	Exterior, investment dru Fishenes)		
	Office of Intergovernmental Articulation and Provention of Social Conflicts		
	Paru Mahi mahi Alliance		
	Ministerio de la Producción-Perú		
PSMA	The (FAO) Port State Measures Agreement		
REMOS	Regional Fisheries Management Organizations (e.g. ICCAT)		
SAC	IATTC-Scientific Advisory Committee		
SCI	Under Secretariat for quality and safety		
SPREMO	South Pacific Regional Fisheries Management Organisation		
SRP	Secretaría de Recursos Pesqueros DEL Ecuador (Ecuadorian Eisheries Secretariat)		
	United Nations Convention on the Law of the Sea		
UNESA	United Nations Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks		
WWE	World Wildlife Fund		



3 Executive summary

Draft determination to be completed at Public Comment Draft Report stage

This assessment was requested to Kiwa by a consortium of leading Ecuadorian dolphinfish exporters made up of the following companies: Propemar, Frigolab San Mateo, Transmarina, Fresh Fish del Ecuador, and Frigolandia. Henceforth, the term client will be used to refer to this consortium of companies.

This Announcement Comment Draft Report (ACDR) provides details to the client on the preliminary results of the initial assessment of the Ecuador Dolphinfish Longline Fishery against the MSC-Fisheries Standard v2.01. The assessment process will follow the MSC Fisheries Certification Process v2.2 and using the default assessment tree (Annex SA) of the MSC Fisheries Standard, v2.01.

Kiwa shall give the client an opportunity to question the team and have an issue re-examined if the client has a concern that insufficient information is available to support the team's decisions or that a decision has been made in error, in accordance with FCP7.11.3. After reviewing the ACDR, the client shall inform Kiwa of its decision to either proceed to announcement of assessment or defer announcement of assessment. If the client proceeds to announce the assessment, in accordance with FCP7.12.1. After the announcement and the publication of this ACDR, 30-day consultation period for stakeholder input will be allowed before the site visit takes place, in accordance with FCP 7.15.1.2.

This report was prepared by Kiwa. The assessment team for this fishery is comprised of Lisa Borges who is mainly responsible for assessing P1, José Ríos who is mainly responsible for assessing P2 and P3 and, as Team Leader, ensure compliance with the MSC fisheries certification process and standard, and Natalia Mora that contributed with the team on the elaboration of P3 and providing local knowledge related to the fishery.

The assessment team has completed this ACDR mainly using the information provided in the Client Document Checklist, together with information from public sources such as the following websites: <u>IATTC</u>, <u>SPRFMO</u>, <u>IUCN</u>, <u>ACAP</u>. Also, several remote meetings were held with the client during January and February 2023 in order to discuss information gaps and needs.

At the time of preparing the ACDR, there two MSC fisheries in the Ecuador which have been recently certified (both in 2022): <u>Eastern Pacific Ecuador Purse Seine Tropical Tuna Fishery</u> & <u>Eastern Pacific Ocean tropical tuna -purse seine</u> (<u>TUNACONS</u>) fishery. However, these fisheries are using a different fishing gear (purse seine) and species assessed in their P1 is the yellowfin tuna, only marginal volumes of dolphinfish are caught as bycatch (less than 1% of the total catch volume). They do not impact the same 'main' species as the fishery evaluated here, and they are subject to a different regulation when it comes to the silky shark (which is the only ETP species impacted by the UoA and subject to national and international limits (because it is a gear-specific regulation). The team checked that there are no other MSC-certified or in-assessment fishery in the Pacific Ocean including dolphinfish in the P1. Thus, no overlapping fisheries were considered in this assessment.

Main strengths and weaknesses of the client's operation identified during the preliminary assessment performed for this ACDR are described below:

Strengths:

- Ecuador and Peru signed in 2014 a Memorandum of Understanding on Fisheries and Aquaculture which still in force today. Under the framework provided by this MoU the research institutes form Ecuador and Peru (IPIAP and IMARPE, respectively) managed to coordinate a joint stock assessment completed in 2021 which also includes management advice.
- Results from the latest assessment showed that the dolphinfish stock is not overfished and not experiencing overfishing.
- Following and exploratory stock assessment carried out in 2016, an exploratory MSE was carried out that same year.
- National Action Plans for the dolphinfish have been designed and implemented both in Ecuador and Peru.
- The thin longline or 'doradero' (LL-DOL) is a highly specific fishing gear. On an average year, the target species accounts for over 88% of the total volume landed by the UoA.
- The impact of the UoA on the Primary P2-component is restricted to 3 minor species (the 3 tropical tunas: EPO yellowfin tuna, EPO bigeye tuna, and EPO yellowfin tuna).
- For 20 out of these 35 secondary components there are biologically based limits available, derived either from analytical stock assessments (e.g. EPO Striped marlin, Pacific blue marlin, South EPO swordfish, Pacific Jumbo squid) or using empirical approaches such as ecological risk assessments (e.g. all secondary shark impacted by the UoA -with the exception of the ray species-).



- Ecuador has National Plans for the Conservation of Sharks (PAT-Ec) and Sea Turtles (PNCTM) in place since 2013 and 2014, respectively. Both Plans have been adopted as national regulations and have gone through a review process after the first 5 years.
- The IATTC has just recently created a new Permanent Working Group on Ecosystem and Bycatch (EBWG) (IATTC Resolution C-22-06).
- The fishing gear is a surface longline that has no direct interactions with any benthic habitats.
- Several National regulations have been recently updated (e.g. LODAP, different regulations on the conservation of protected sharks, regulation increasing the minimum observer coverage)

Weaknesses:

- The IATTC has jurisdiction over the eastern Pacific Ocean but does not recognize dolphinfish as a species under its responsibility and to date has not adopted any specific management measure for this stock.
- There is no evidence that the cooperation undergone under the framework provided by the bilateral MoU signed between Ecuador and Peru has been able to deliver joint management actions: the closed seasons and authorized hooks differ between the two countries, the minimum size is measured differently, and unlike Peru, Ecuador does not set a TAC.
- There is no evidence that the latest stock assessment of the dolphinfish has been peer-reviewed.
- There are no generally understood harvest control in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment is approached.
- The risk of handling non-certified products starts right on board, since (as far as the team is aware at this stage) catches from different types of gear (LL-DOL and LL-TBS) are not segregated. Therefore, this is a relevant risk to be considered in this fishery and the team could not identify mitigation measures that fully eradicate this risk.
- At this stage the team does not have evidence that catches of bait species are being recorded in this fishery. No quantitative data on the volumes of bait species used were made available at the time of preparing the ACDR, so the team classified bait species as 'main' or 'minor' P2-subcomponents based on different qualitative data sources. However, quantitative data on the volume are essential to complete the assessment of the bait species in accordance with the MSC requirements and the team has warned the client about this.
- No reference points are available for 9 of the minor secondary species identified (i.e. Pompano dolphinfish, wahoo, black skipjack, striped bonito, black marlin, Indo-Pacific sailfish, short bill spearfish, escolar, pelagic stingray, longtail stingray.), so they were considered as Data Deficient (DD) for this assessment, and RBF would be needed to assess the impact caused by the UoA.
- The fishery interacts with several shark species which have been recently assessed (Griffith et al. 2022) as 'most vulnerable' or 'increasingly vulnerable'.
- The IATTC scientific staff and the BYC have repeatedly recommended at least 20% observer coverage on longline vessels fishing for tunas in the Convention Area, and also that the Scientific Advisory Committee (SAC) determined that the appropriate measure of longline fishing effort for calculating observer coverage is "number of hooks." Despite the UoA's observer coverage in number of hooks has not been made available, the estimates made by the team indicate that actual coverage in number of hooks is likely to be below 1%, compromising the representativeness of the of the observations, especially in the case of species with very low interaction frequencies.
- Other shortages in the observers' data have been identified by the team (i.e. inconsistencies on the observer coverage or species composition between different data sources, no data on the post-capture survival or bait species used was made available at this stage, no data on size frequencies of the interacted silky sharks is provided -so compliance with the national requirement banning retention of individuals below 100cm could not be assessed-).
- The low observer coverage compromises the representativeness of the lack of interactions between the UoA and seabirds, turtles or marine mammals recorded by the observers. Thus, the team considered that the impact of the UoA on protected seabirds, turtles (in particular albatrosses and petrels) and marine mammals cannot be analytically determined. Thus, are all considered as Data Deficient ETP components that shall be assessed using the RBF.
- At this stage it is not clear if the obligation (Article 225, Ex-.Dec 362/2022) to record in the logbook all catches, including incidental interactions with protected sharks, turtles, seabirds and marine mammals is being accomplished.
- There is no evidence that the UoA is implementing the mitigation measures for turtles and seabirds adopted at the IATTC level (C19-04 and C-11-02 respectively).
- The existing MoU between Ecuador and Peru does not provide explicitly defined and well understood functions, roles and responsibilities for key areas of responsibility and interactions of the different organizations involved in the fisheries management. Also, the functions and role of the IATTC and the SAC are not clear in relation to this fishery.



- No clear long-term objectives guiding decision-making (such those expressed in Article 2 in the Regulation of the Parliament and the European Council N1380/2013) can be found in the applicable management policies of Ecuador and Peru.
- There is no evidence that the effectiveness of the existing management decision has been tested, and it is not clear that decision-making processes can respond in a timely and adaptive manner to serious and important issues affecting the fishery.
- At the time of preparing this report no details on the implementation and performance of the Advisory Council
 of Aquaculture and Fisheries were made available for the team, and the dialogue roundtable for the NAP Dorado
 mandated by the LODAP has still not been established.
- In November 2022 the UE sent a delegation for review the yellow card. However, at the time of preparing this ACDR the yellow card has still not been lifted.
- During the preparation of the ACDR the team did not have access to detailed information on the number of
 inspections performed and infringements found in recent years (e.g.2019-2021); and also on how the sanctions
 are applied and further information is required on this topic.

MSC GUIDANCE: From Public Comment Draft Report reporting stage only - the draft determination / determination reached with supporting justification

4 Report details

4.1 Authorship and peer review details

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

Jose Rios, holds a degree in Sea Sciences from the University of Vigo and an MSc in Fisheries and Aguaculture from the University of Wales-Bangor. He has more than 20 years of experience working in fisheries from different angles and places around the world. In 1999 he worked at the ICM-CSIC on trophic ecology of demersal fish species and participated in different research cruises on board the r/v Garcia del Cid. In 2001/02 he was hired by the University of Azores as observer and fisheries inspector assessing an experimental fishing license for Orange roughy. Between 2003 and 2010 he was responsible for designing and monitoring fisheries management plans for several marine resources (clams, cockles and barnacles) for the Regional Fisheries Authority of Galicia (Spain). In 2008-09 he developed and implemented a scientific monitoring scheme for an experimental octopus fishery in the waters of Namibia (IIM-CSIC). Between 2008 and 2012, as part of different projects funded by the Spanish International Cooperation Agency (AECID), he supported local fisheries and aquaculture management bodies to strengthen organizational and managing capacities of the fishing and rural aquaculture sector in Namibia, Cape Verde, Colombia and Mozambique. Since 2013, as part of the fisheries team of WWF Spain, he promoted different initiatives to improve fisheries management in coastal Spanish fisheries. As the WWF representative in fisheries co-management committees, he took part in the daily management of the following coastal fisheries in the Spanish Mediterranean: Catalan sandeel, Balearic boat seines, and Palamós red shrimp. Between 2016 and 2020 he was a full-time employee at Bureau Veritas Fisheries Department and then at DNV-GL, mainly acting as MSC-Fisheries and MSC-CoC auditor. Since September 2020 he is a freelance and he keeps acting as MSC-Fisheries auditor. He has participated in several MSC fisheries assessments and surveillance audits. He has completed the MSC training in the use of the RBF.

His 7 years in charge of designing and monitoring fisheries management plans for the exploitation different marine resources in Galicia, together with his experience on trophic ecology of demersal fish species in the Mediterranean (ICM-CSIC), his work with the University of Azores assessing an experimental fishing license for Orange roughy in the Azores islands, and his experience designing and monitoring an experimental fishing license for octopus in Namibia (IIM-CSIC) ensure he meets qualification and competency criteria established in PC3 for (i) Fishing impacts on aquatic ecosystems. Also, his 3 years of experience as a practicing fishery manager as a WWF representative in 3 Mediterranean fisheries, together with his 7 years of experience participating in the implementation of fisheries management plans in Galicia and his experiences assessing experimental fishing licenses in the Azores and Namibia ensure he meets qualification and competency criteria established in PC3 for (ii) Fishery management and operations.

For this initial assessment he will act as Team Leader and his main responsibility will be on assessing Principle 2 and Principle 3.

Lisa has been a fishery scientist for over 20 years and runs her own consultancy firm. Lisa has a BSc in Marine Biology & Fisheries from the University of the Algarve (Portugal), an MSc in Fisheries from the University of Porto (Portugal),



and a PhD on discards from demersal fisheries from the National University of Ireland. She has worked for three national fisheries research institutes, which include IPMA (Portugal), the Marine Institute (Ireland), and IMARES (The Netherlands). Lisa has extensive knowledge and experience of assessing the environmental impact of fisheries, with a particular focus on discards and bycatch. She also has knowledge and experience of fisheries management policies, including harvest control rules; management plans and discard policy development. Lisa developed conservation policies for Atlantic fish stocks when she worked for the European Commission in Belgium. Lisa has experience in both pelagic and demersal stock assessments, and is familiar with MSC assessment procedures, having participated as a principle 1 and 2 expert in different assessments

For this initial assessment she will act as the responsible on assessing Principle 1.

Natalia Mora is an Anthropologist from the Pontifical Catholic University of Peru and a Msc in Urban Management and Development from Erasmus University Rotterdam. She has experience in governance and research in socioenvironmental matters related to artisanal fisheries in Peru. She was an environmental and social consultant for the Marine Program at WWF-Peru, leading and organizing the methodology for the participatory process of policy making of "Rules and Regulations for the Extraction of Mahi-Mahi Fish". Furthermore, during her work at WWF, she analysed the environmental and social problems related to several fisheries, like mahi-mahi and giant squid, providing a set of solutions to ensure sustainable practices.

Moreover, she was a co-author of the "Practical guide to address conflicts related to artisanal fisheries", providing tools for dialogue and negotiation to manage social conflicts. On the other hand, she managed prevention, handling and monitoring of social conflicts in diverse regions in Peru for the Ministry of Production. Developed fieldwork, mapping actors, monitoring and evaluating policy implementation and projecting scenarios for optimum results related to artisanal fisheries. She also had an active participation in multisectoral spaces created to resolve problems related to rules and regulations, lack of infrastructure and formalization process of artisanal fishermen. In this matter, she had to work hand in hand with different ministries, regional and local government, fishermen organizations, academia and private sector to find viable solutions. Her experience in negotiation and conflict resolution was a key factor to reach agreements and to implement viable and environmental solutions for the local population.

For this initial assessment she will act as a support on the elaboration of P3 and providing local knowledge related to the fishery.

4.2 Version details

Details on the version of the fisheries program documents used for this assessment are presented in table below.

Table 4.2.1.1 – Fisheries program documents versions

Document	Version number, date of publication (and date effective)
MSC Fisheries Certification Process	Version 2.2, 25 March 2020 (25 September 2020)
MSC Fisheries Standard	Version 2.01, 31 August 2018 (28 February 2019)
MSC General Certification Requirements	Version 2.4.1, 7 May 2019 (28 September 2019)
MSC Reporting Template	Version 1.2, 25 March 2020 (25 September 2020)



5 UoA, UoC, overview of the fishery and results overview

5.1 Unit of Assessment, Unit of Certification and Overview of the fishery

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

- This is a wild-capture fishery.
- The fishery is not based on any introduced species.
- It does not target species classified as 'out-of-scope' (amphibians, reptiles, birds, mammals).
- The fishery does not make use of any kind of poisons or explosives.
- The assessed fishery takes place in the EEZ of Ecuador (FAO Subdivisions 87.1.11 & 87.1.12) and international waters (FAO Division 87.1.4). The fishery is not conducted under any controversial unilateral exemption to an international agreement and its management regime includes mechanisms for resolving disputes. The Republic of Ecuador signed the Inter-American Tropical Tuna Commission (IATTC) in 2004 and ratified the convention in 2021.
- Ecuador is member of the International Labour Organization (ILO). The country has ratified 62 conventions, including 8 Fundamental Conventions (including the Forced Labour and the minimum age Conventions) and 3 Governance Conventions. The CAB is not aware that none of the fishing operators included in the UoA have been successfully prosecuted for a forced or child labour in the last 2 years.
- The client has completed and submitted to the CAB the 'Certificate Holder Forced and Child Labour Policies, Practices and Measures Template' to detail the policies, practices and measures in place to ensure the absence of forced and child labour. This template was submitted to the CAB and, in the case the fishery enters into full assessment, it will be published at the MSC website together with the ACDR and the announcement of the fishery entering the assessment process, as required in FCP 7.4.4.4.
- The CAB is not aware that the client does not include an entity that has been convicted for a shark finning violation in the last 2 years, as required in FCP 7.4.2.10. However, in the case the client decides to proceed to full assessment, this topic shall be checked with relevant management authorities during the site visit.

Besides, Kiwa has checked that:

- There are no catches of non-target species that are inseparable or practically inseparable (IPI) from target stock.
- The fishery announced that entered assessment in November 2019, and withdrew the process in December 2020 due to administrative reasons. No report was published on that occasion.
- At the time of preparing the ACDR, the only MSC-certified fishery in the Ecuador is the <u>Eastern Pacific Ecuador</u> <u>Purse Seine Tropical Tuna Fishery</u>. Yellowfin tuna is the only species assessed under P1 of this purse seine fishery, and only marginal volumes of dolphinfish are caught as bycatch (accounting for only 0,43% of the total catch volume). The team also checked that there is no other MSC-certified or in-assessment fishery in the Pacific Ocean which includes dolphinfish in the P1. Thus, no overlapping fisheries were considered in this assessment.
- The fishery under assessment entered into assessment in February 2019 against the Fisheries Certification Requirements v2.0. A site visit was performed the week of the 20th of May in Ecuador. However, Bureau Veritas withdrew the fishery from the process due to administrative reasons in December 2020 as set out in the notice of withdraw published on the 9th of December 2020. Kiwa confirms that the fishery has re-entered full assessment as set out in FCP 7.26.6. Although the client has facilitated the Preliminary Draft Report, Kiwa considers that the details of the initial assessment including the results do not have to be publish because the report was confidential at that time.



5.1.1 Unit of Assessment

The Unit of Assessment is shown in the table below.

Table 5.1.1.1 – Unit of Assessment (UoA)

UoA 1	Description		
Species	Common dolphinfish (Coryphaena hippurus). FAO 3-Alpha 'DOL'		
Stock	Southeast Pacific Ocean		
Fishing gear type(s) and, if relevant, vessel type(s)Fishing gear: Longline (thin surface longline, 'doradero').Fleet: All authorized fishing vessels from Ecuador targeting dolphinfish using the th longline (i.e. authorized mother ships -'nodrizas'-, their associated fiber-glass skift, and all independent 'fibras') are included in the assessment. However, only som			
Client group	The client group is composed of a consortium of leading Ecuadorian mahi mahi exporters made up of the following companies: Propemar, Frigolab San Mateo, Transmarina, Fresh Fish del Ecuador, and Frigolandia.		
Other eligible fishers	All authorised vessels excluded from the UoC (See Table 5.1.1.1) would be considered as other eligible fishers and they could only access the certificate by agreeing on signing the certificate sharing. Thus, to be included in the UoC the vessels must commit to complying with the requirements established by the client in the certificate sharing.		
Geographical area	 The fleet operates in FAO Fishing Area 87 (Pacific, Southeast): Subarea 87.1 (Northern): Subdivisions 87.1.11 & 87.1.12 (Northern Coastal, EEZ of Ecuador) and Division 87.1.4 (Northern Oceanic, International waters). 		
Justification for choosing the UoA	 The Ecuadorian longline fleet targeting Mahi mahi fishes by means of two different types of vessels: Fiber-glass skiffs (fibras): These are small boats, ranging from 3 to 10m in length. They operate either independently up to a distance that normally does not exceeds 80 NM from the base-line, or associated to a mothership in more distant fishing grounds. They have an autonomy of between 1 and 3 days. Mother-ships (nodrizas): These are larger vessels, normally ranging from 14 and 30 m in length, usually converted from small purse seiners that formerly fished small pelagics. They tow fiber-glass skiffs, up to a limit of 10 vessels (Ministerial Agreement no. 407, Article 1) to distant fishing grounds (reaching fishing grounds up to 1,700 NM from mainland). They have an autonomy of between 10 and 40 days. Once the fishing ground is reached, the 'fibras' separate from the mother and start fishing. Once they have finished fishing, they offload their catch to the 'nodrizas'. In addition, the 'nodrizas' have their own catching capacity as most of them have installed longline fishing lines. Both 'fibras' and 'nodrizas' store the fish chilled in ice. This fishing system allows the fibreglass vessels to operate in fishing grounds that they could not reach on their own. Initially, the mother ships only had the role of towing the fibres and storing the catches, but later they were given the capacity to fish. There are also 'fibras' targeting dolphinfish that are not associated with mother ships. These 'fibras' operate directly from land and the distance at which they can work is limited, so there if the reaction. 		



5.1.2 Unit of Certification

The proposed Unit of Certification is shown in the table below.

Table 5.1.2.1 – Unit of Certification (UoC)

UoC 1	Description
Species	Common dolphinfish (Coryphaena hippurus)
Stock	Southeast Pacific Ocean
Fishing gear type(s) and, if relevant, vessel type(s)	<u>Fishing gear</u> : Longline (thin surface longline, 'doradero'). <u>Fleet</u> : A list of vessels facilitated by the client (certificate holder) targeting dolphinfish with the thin surface longline (i.e. authorized mother ships -'nodrizas'-, their associated fiber-glass skiffs -'fibras'-, also all independent 'fibras'). This list would be kept updated, and changes would be communicated to the pertinent CAB.
Client group	The client group includes the consortium of leading Ecuadorian mahi mahi exporters made up of the following companies: Propemar, Frigolab San Mateo, Transmarina, Fresh Fish del Ecuador, and Frigolandia. These companies are the certificate holders.
Geographical area	 The fleet operates in FAO Fishing Area 87 (Pacific, Southeast): Subarea 87.1 (Northern): Subdivisions 87.1.11 & 87.1.12 (Northern Coastal, EEZ of Ecuador) and Division 87.1.4 (Northern Oceanic, International waters).

5.1.3 Overview of the fishery

History of the fishery and characteristics of the longline fleet

In Ecuador, the longline fleet accounts for approximately 20% of the total fishing fleet (MPCEIP, 2022a¹). Dorado ranks first in importance in terms of large pelagics caught using longlines, with 38% of total landings in the last decade (data calculated by the team using the IATTC database: <u>EPO total estimated catch by year, flag, gear, species</u>).

This fishery began gradually in the mid-1970s but underwent a great expansion during the 1990s and 2000s. As described in Martinez-Ortiz et al (2015), the great novelty at that time was that a new "oceanic-artisanal" fleet component was developed. This 'oceanic-artisanal' fleet consists of mother-ship (nodriza) boats with their towed fiber-glass skiffs (fibras) operating with pelagic longlines. It is estimated that mothership-based operations produce as much as 80% of the total catches of the artisanal fishery (Martinez-Ortiz et al, 2015). The remainder is produced by independent fibras operating within 80NM from the baseline, Martinez-Ortiz et al. (2015)).

The fiber-glass skiffs are small boats ranging from 3 to 10m in length, while the mothership vessels are larger vessels ranging from 14 and 30m in length. The mothership vessels are usually converted from small purse seiners that formerly fished small pelagics. These vessels have an autonomy of 30-40 days, while fibras have an autonomy of 1-3 days. According to MPCEIP (2022b²), in 2021 the duration of the fishing trips performed by mothership vessels was between 15 and 36. This Ministerial Agreement 407 passed in 2011 set that a single mothership vessel cannot tow more than 10 fiber-glass skiffs.

It is important to remark that there are both mothership vessels registered as industrial vessels and as artisanal vessels, since it is only the presence of mechanized equipment such as a hydraulic hauler that determines their categorization

² MPCEIP. 2022b. Reporte sobre los días de operatividad en altamar de las embarcaciones nodrizas de palangre de superficie a la deriva en el Ecuador. Abril 2022. PAN Dorado. Ministerio de Produccion, Comercio Exterior, Inversiones Pesca. Available under request.



¹ MPCEIP. 2022a. Reporte Técnico. Desembarque, composición de tallas y proporción sexual del dorado Coryphaena hippurus capturado en aguas del Océano Pacífico Suroriental: Flota pesquera del Ecuador. Abril 2022. PAN Dorado. Ministerio de Produccion, Comercio Exterior, Inversiones Pesca. Available from: https://www.produccion.gob.ec/wp-content/uploads/2022/04/REPORTE-TECNICO-DESEMBARQUE-TALLAS-Y-PROPORCION-SEXUAL-DEL-DORADO-FINAL.pdf

as industrial, unlike artisanal mothership vessels that do not have hydraulic systems or haulers (MPCEIP, 2022a). However, the Article 152 of Executive Decree N°362 passed in February 2022 sets that for all legal purposes, all vessels that operate as mothership vessels will be subject to the legal regime applicable to industrial vessels. Also, this Executive Decree sets that the fiber-glass skiffs will be considered an integral part of the fishing unit and will be duly registered and associated with the mothership vessel in the records of the governing body (Article 183).

According to MPCEIP (2022b), in 2022 a total of 2,844 fiberglass skiffs were registered and authorized to target large pelagic species (using either longline or gillnets), while the number of motherships is 244 (of which 140 are artisanal and 104 are industrial). This indicates a significant reduction in the size of the fleet in recent years, since according to Martinez-Ortiz et al (2015) the fleet amounted to 6,773 fiberglass skiffs and 317 mother-ships during the period 2008-2012.

Fishing area where the UoA operates

The area of operation of the UoA corresponds to the jurisdiction of Ecuador Subdivisions (FAO Fishing Subdivisions 87.1.11 & 87.1.12) and international waters (FAO Division 87.1.4).

While traditional fishing grounds were initially within 40NM off the coast, the use of mothership vessels has expanded gradually into oceanic waters as far offshore as 110°W, west of the Galapagos Archipelago (more than 1,7000 NM from the mainland), as shown in **Figure 5.1.3.1.** This has led to the development of the 'oceanic-artisanal' fleet described in the previous section.



Figure 5.1.3.1. Map showing the navigation routes between September 2020 and December 2022 of the vessels included in the proposed UoC. Source: data retrieved from <u>Global Fishing Watch</u> by the client.

Fishing techniques used to catch mahi-mahi by the UoA

All the information presented below was extracted from Martinez-Ortiz et al, 2015, unless otherwise indicated.

The multispecies nature of the Ecuadorian artisanal (and oceanic-artisanal) fishery for large pelagic species is reflected in the use of multiple gear types. Pelagic longline and surface gillnets are the dominant gears in the fishery, although the gear usage pattern varies among ports. Other gear types catch large pelagic species (e.g., handlines, trolling), but in very low amounts compared to longline and surface gillnet. A general description of the three main gears used for targeting large pelagic species is shown below, although gears configurations vary among ports:

Thin longline known as 'Doradero' (LL-DOL). The configuration of this gear consists of a buoyed mainline with 300 – 700 branch lines, each separated by 16–25 m (3-7 branch lines between two buoys, according to Martinez-Ortiz and Zuñiga-Flores, 2012). This means that longlines are between 4,8 and 17 km long. Branch lines are 6 – 13 m in length, and according to Martinez-Ortiz and Zuñiga-Flores (2012) there are between 3 and 7 branch lines between two buoys. Each branch line holds a hook, meaning that each longline would hold between 300 and 700 hooks. However, Martinez-Ortiz and Zuñiga-Flores (2012) indicate that the number of



branch-lines/hooks per longline can reach up to 900 or even 1200. The authorized hooks (Agreement 070/2011) can be either J-hooks in sizes 3, 4, 5 and 6 or C-hooks (circle) in sizes 14 and 15. **Figure 5.1.3.2** below shows the types of J-hook used to target dolphinfish. This fishing gear cannot be used during the closed season for dolphinfish, which is Ecuador last from July 1st to October 7th (Agreement 070/2011).

- Tuna-Billfish-Shark longline (LL-TBS). The configuration of this gear consists of a mainline with 120 300 branch lines, each separated by 40 60 m. Branch lines are 11 34 m in length. According to MPCEIF (2022) the hooks can be either J-hooks in sizes 36 and 38, or C-hooks (circle) in size 15. The typical LL-DOL J-hook has a smaller opening than the typical LL-TBS hook and is slightly longer.
- Surface gillnets (GN). The configuration of this gear consists of a single panel of netting, 950 1950 m in length and approximately 7.5 – 9.5 m in depth, with a stretched mesh size 114 – 152 mm.

In Ecuador, the longline fleet operates throughout the year and the species composition of its catches is strongly influenced by the northwesterly circulation of the Humboldt Current along the coast of Peru and its associated cold waters masses. The target species and longline gear-type used by the mothership vessel change seasonally, with the incursion of cool waters (< 25°C) from the south and offshore the fleet uses the thin longline gear known as 'doradero' to target the dolphinfish, and this species dominates the catches during this season. However, in warmer waters, the fishery changes to tuna-billfish-shark longline gear and the catch composition becomes much more diverse.

The only gear included in the UoA is the thin longline known as 'doradero' (LL-DOL).



Figure 5.1.3.2. Types of J-hook used by the Ecuador longline fleet to target dolphinfish. Source: Martinez-Ortiz and Zuñiga-Flores (2012).

The bait to be used by the fibers and nurses is captured by using jigs, hand lines. According to Martinez-Ortiz and Zuñiga-Flores (2012) the types of bait or bait used are squid (*Dosidicus gigas*); the frigate tuna (*Auxis thazard thazard*) and the bigeye scad (*Selar crumenophthalmus*). Only the bigeye scad is used alive, the other two species of bait are cut into pieces before being placed on the hooks Martinez-Ortiz and Zuñiga-Flores (2012). Besides, during the preparation of the ACDR the client performed a survey among 51 vessel owners to determine which bait species they are using. The result of the survey did not allow at this stage to obtain an estimate of volume per species, but it showed that the species used were flying jumbo squid, frigate tuna, pacific thread herring (*Opisthonema spp.*), and chub mackerel (*Scomber japonicus*).

Martinez-Ortiz and Zuñiga-Flores (2012) describes that longlines are periodically check from the vessel to collect the fish caught and re-bait the hooks. The common dolphinfish is bled before storage on ice. Fiberglass skiffs associated with mother-ship vessels regularly transship their catches to the correspondent mothership vessel.

5.2 Assessment results overview

5.2.1 Determination, formal conclusion and agreement

To be drafted at Public Comment Draft Report stage

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

The CAB shall include in the report a formal statement as to the certification action taken by the CAB's official decisionmaker in response to the determination recommendation.



Reference(s): FCP v2.2, 7.20.3.h and Section 7.21

5.2.2 Principle level scores

To be drafted at Client and Peer Review Draft Report stage

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

Reference(s): FCP v2.2 Section 7.17

Table 5.2.2.1 - Principle level scores		
Principle	UoA 1	
Principle 1 – Target species		
Principle 2 – Ecosystem impacts		
Principle 3 – Management system		

5.2.3 Summary of conditions

To be drafted at Client and Peer Review Draft Report stage

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

Reference(s): FCP v2.2 Section 7.18

Table 5.2.3.1 – Summary of conditions

Condition number	Condition	Performance Indicator (PI)	Deadline	Exceptional circumstances?	Carried over from previous certificate?	Related to previous condition?
				Yes / No	Yes / No / NA	Yes / No / NA
				Yes / No	Yes / No / NA	Yes / No / NA
				Yes / No	Yes / No / NA	Yes / No / NA

5.2.4 Recommendations

To be drafted at Client and Peer Review Draft Report stage

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

6 Traceability and eligibility

6.1 Eligibility date

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

Reference(s): FCP v2.2 Section 7.8

FCP v2.2 Section 7.8.1 states that "*The CAB shall nominate a date from which product from a certified fishery is eligible to be sold as MSC certified or bear the MSC ecolabel (the eligibility date).* The eligibility date can be determined on the certification date or between the certification date and the first Public Comment Draft Report (7.8.1.1). Nevertheless, the results at this stage (ACDR) show that the fishery would fail the certification process. If necessary, the elegilibity date would be agreed with the client at a later stage.

6.2 Traceability within the fishery

The CAB shall include in the report a description of the tracking, tracing and segregation systems within the fishery and how these systems will allow any products sold as MSC certified to be traced back to the Unit of Certification.

The CAB shall include in the report an evaluation of the robustness of the management systems related to traceability.

The CAB shall include in the report any traceability references, including hyperlinks to publicly-available documents.

The CAB shall include in the report a description of the factors that may lead to risks of non-certified seafood being mixed with certified seafood prior to entering Chain of Custody using the table below. For each risk factor, there shall be a description of whether the risk factor is relevant for the fishery and, if so, a description of the relevant mitigation measures or traceability systems in place.

Reference(s): FCP v2.2 Section 7.5.7, 7.9, 7.10, 7.20.3

In Ecuador the dolphinfish fishery is carried out by a mother-ship vessels that can have up to ten fiber-glass skiffs and they fish together as a unit. The mother-ship vessel stores the fish that the fiber-glass skiffs have captured during the day. According to the fishing permit the type of gear that vessels may carry is LL-TBS (thick longlines) and LL-DOL (thin longlines) or mixed longlines.

The dolphinfish season in Ecuador goes from October to June of each year (Ministerial Agreement No. 070 of May 19, 2011) and usually the fishermen use the LL-DOL (thin longlines) to catch dolphinfish. However, there are reports from the SRP that show that there is a low percentage of dolphinfish being caught with the LL-TBS (thick longlines). The mechanisms to verify the type of gear that the vessels use are: i) the fishing logbook (LODAP, article No. 162 and General Regulation, article No.225) that has to be completed daily and it must be delivered on the landing site or when the completion of fishing operations is achieved and ii) the Certificate of Monitoring and Control of Fisheries Landing (CMCDP) (Article 238, LODAP), that is issued after the inspector certifies that the vessel has the permits or documents required by law (fishing logbook, fishing permit, departure permit and landing declaration).

Although the fishing logbook provides information about the fishing gear used daily, the team is not certain if fishermen detail the type of hook used (LL-TBS or LL-DOL) or if they only detail the main gear (longline). On the other hand, in the case that fishermen use both type of gears, the team has no information on whether there is an established protocol to avoid mixing the dolphinfish caught with different hooks. Regarding the CMCDP, the team does not have enough information on whether the inspectors check the activity of all the vessels of the fishing unit (mothers-vessels and fibers skiffs) or if the inspectors only check the mother-ship vessels as these are the vessels that carry all the fish. Besides, it is also not clear how the catches of mixed longlines recorded.

Regarding the possible risks of vessels in the UoC also fish outside the UoC geographic area and the risk of transhipment, the mother ship vessels are tracked by a VMS during operation (Agreement MPCEIP-SRP-2022-0150-A). As for fiberglass skiffs, according to Article 113 of the LODAP they must have a VMS installed, however the client has informed that the fiberglass skiffs have not installed the system yet. It is important to highlight that all VMS must be authorized by the National Defense entity, the information from the VMS is managed by the Administration of the Monitoring Center (*Administración del Centro de Monitoreo*).



The UoC geographic area is the Ecuadorian waters within the EEZ including international waters. The VMS used during the operation are being monitored by different authorities and the sanctions for fishing outside the UoC are deterrent for mothership-vessels and fiber-glass skiffs. Regarding the transhipment, this is not allowed since all fishing effort of a fishing unit (mother-ship vessels and fiber-glass skiffs) must be reported for the issuance of the CMCDP. The VMS allows the authorities to check if any transhipment occurs. Moreover, sanctions for transhipment between mothership-vessels are deterrent.

Factor	Description
	The fishing permit indicates that the type of gear that vessels may carry is LL-TBS (thick longlines) and LL-DOL (thin longlines). Nevertheless the LL-TBS is not included in the UoA. Therefore, this a relevant risk factor.
Will the fishery use gears that are not part of the Unit of Certification (UoC)?	The mitigation measures in place are the registration on the fishing logbooks where the regulations require to record the type of gear used. In addition, all landings should be inspected for the issuance of the CMCDP and the inspector must detail the type of gear employed. These two instruments would allow to know the type of gear (LL-TBS or LL-DOL) used for dolphinfish catches, as evidence the client gave the team the SRP reports that show the amount of dolphinfish catches by different types of gear.
If Yes, please describe: If this may occur on the same trip, on the same vessels, or during the same season; How any risks are mitigated.	Notwithstanding the above, the team has identified several risks. First is not clear if fishermen detail the specific type of gear (LL-TBS or LL-DOL) in the logbook. Second, as far as the team is concerned, there is no protocol on board to separate the dolphinfish that was caught with different gears. Third, it is not clear if the inspector checks the type of gear used by the mother-ship vessels and the fiber-glass skiffs. Considering that the mother-ship vessels gather all the dolphinfish fished by the fiber-glass skiffs, the team must be certain that the inspector considers the type of gear used by all vessels.
	Based on the above, there is relevant risk and the team could not identify mitigation measures to avoid this risk.
	The vessels fish either in Ecuadorian waters within the EEZ or in international waters covered by the UoC, so this is not a relevant risk factor.
 Will vessels in the UoC also fish outside the UoC geographic area? If Yes, please describe: If this may occur on the same trip; How any risks are mitigated. 	Each mother-ship vessels has ten fiber-glass skiffs and they fish together as a unit. All mothership-vessels have an operating VMS on board and there are different authorities monitoring those signals. As far as the team knows, the fiber-glass skiffs do not have a VMS on board, but the skiffs operate close to the mother-ship vessels. Besides, the sanctions for operating in a non-authorized area are deterrent. So, the risk that the vessels to operate outside the UoC geographic is considered to be NOT relevant for this fishery.
Do the fishery client members ever handle certified and	The risk of handling non-certified products start right on

Table 6.2.1 – Traceability within the fishery

Do the fishery client members ever handle certified and non-certified products during any of the activities covered board, since (as far as the team is aware at this stage)



by the fishery certificate? This refers to both at-sea activities and on-land activities. Transport Storage Processing Landing Auction	catches from different types of gear (LL-DOL and LL-TBS) are not segregated. To the team's knowledge there is no clear system to segregate catches according to the type of longline used. Therefore, there is a relevant risk and the team could not identify mitigation measures to avoid this problem.
in res, please describe new any holds are miligated.	
Does transhipment occur within the fishery?	Transhipment is not allowed between different mothership- vessels, so this is not a relevant risk factor.
If Yes, please describe: If transhipment takes place at-sea, in port, or both; If the transhipment vessel may handle product from outside the UoC; How any risks are mitigated.	All mothership-vessels have an operating VMS on board and the Ecuadorian authorities are monitoring those signals. Besides, the sanctions for transhipment between mothership-vessels are deterrent. So, the risk of transhipment is considered to be NOT relevant for this fishery.
Are there any other risks of mixing or substitution between certified and non-certified fish? If Yes, please describe how any risks are mitigated.	No other risks of mixing or substitution between certified and non-certified fish have been identified by the team

6.3 Eligibility to enter further chains of custody

To be drafted at Client and Peer Review Draft Report stage

Although this section should not be addressed at this point, the team considers important to state that due to the risk associated to the use of non-assessed gears (i.e. LL-TBS) by the UoA, the MSC Chain of Custody should start on board. At least, this is the determination of the team with the information available at the time of preparing the ACDR.

The CAB shall include in the report a determination of whether the seafood product will be eligible to enter certified chains of custody, and whether the seafood product is eligible to be sold as MSC certified or carry the MSC ecolabel.

The CAB shall include in the report a list of parties, or category of parties, eligible to use the fishery certificate, and sell product as MSC certified.

The CAB shall include in the report the point of intended change of ownership of product, a list of eligible landing points, and the point from which subsequent Chain of Custody certification is required.

If the CAB makes a negative determination under FCP v2.2 Section 7.9, the CAB shall state that fish and fish products from the fishery are not eligible to be sold as MSC certified or carry the MSC ecolabel. If the client group includes other entities such as agents, unloaders, or other parties involved with landing or sale of certified fish, this needs to be clearly stated in the report including the point from which Chain of Custody is required.

Reference(s): FCP v2.2 Section 7.9

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

Where IPI stock(s) are present, the CAB shall include in the report an evaluation of the species, stock, proportion and weight of the catch of IPI stock(s) and their eligibility to enter further chains of custody. The CAB shall include in the report a justification of how requirements in FCP Annex PA are met for any catches of IPI stock(s).

Reference(s): FCP v2.2 Section 7.5

7 Scoring

7.1 Summary of Performance Indicator level scores

At the ACDR, the team provides a draft scoring range for each PI. The table below summarises the results at this stage: **Table 7.1.** Summary of draft scores for each Performance Indicator

Principle	Component	Performance Indicator (PI)		UoA 1
	Outcomo	1.1.1	Stock status	≥80
	Outcome	1.1.2	Stock rebuilding	N/A
0.00		1.2.1	Harvest strategy	60-79
One	Managamant	1.2.2	Harvest control rules & tools	<60
	Management	1.2.3	Information & monitoring	≥80
		1.2.4	Assessment of stock status	60-79
		2.1.1	Outcome	≥80
	Primary species	2.1.2	Management strategy	≥80
		2.1.3	Information/Monitoring	≥80
		2.2.1	Outcome	60-79
	Secondary species	2.2.2	2 Management strategy	<60
	2.2.3 Information/Monitoring	Information/Monitoring	60-79	
T	ETP species	2.3.1	Outcome	Silky shark: 60-79 All other ETPs: RBF needed
IWO		2.3.2	Management strategy	<60
		2.3.3	Information strategy	<60
		2.4.1	Outcome	≥80
	Habitats	2.4.2	Management strategy	≥80
	2.4.3 Information	Information	≥80	
		2.5.1	Outcome	60-79
	Ecosystem	2.5.2	Management	60-79
		2.5.3	Information	≥80
		3.1.1	Legal &/or customary framework	60-79
Three	Governance and policy	3.1.2	Consultation, roles & responsibilities	60-79
Inree		3.1.3	Long term objectives	60-79
		3.2.1	Fishery specific objectives	≥80



	Fishery energifie	3.2.2	Decision making processes	60-79
	management 3.2.3 Compliance & enforcement	Compliance & enforcement	60-79	
	system	3.2.4	Monitoring & management performance evaluation	60-79

7.2 Principle 1

7.2.1 Principle 1 background

Biology

Dolphinfish or common dolphinfish (*Coryphaena hippurus*) is a highly migratory species, distributed in the Atlantic, Pacific and Indian Oceans in tropical and subtropical water where it forms schools. Feed on almost all forms of fish and zooplankton; also takes crustaceans and squid. Spawns in the open sea and probably approximate to the coast when water temperature rises (Fishbase, 2023). Coastal distribution and abundance seems to be strongly related to surface temperature and distance from temperature fronts (several authors in Guzman et al., 2015).

The species has a very fast growth rate, reaching in the Mediterranean the maximum length of 2 meters in less than 3 years (Morales-Nin & Azevedo, 2004), and in the Pacific between age classes 2 and 3 (70-140 cm; Guzman et al., 2015). Sexual maturity is reached in the Mediterranean in 4-5 months at 55 to 62 cm, depending if they are female or male, respectively (Massuti & Morales-Nin, 1997). Dolphinfish lives an average of two years and a maximum of five years (Beardsley,1967 in Guzman et al., 2015). A latitudinal variation in size has been observed in Ecuador, increasing in size toward the North (Martínez-Ortiz & Zúñiga-Flores, 2012 in Guzman et al., 2015).



Figure 7.2.1.1 - Global distribution of common dolphinfish (Coryphaena hippurus) (Fishbase, 2023).

Fisheries

Dolphinfish is one of the main fish species of commercial importance in the corridor of the Eastern Tropical Pacific (Costa Rica, Panama, Colombia, Ecuador) (Guzman et al., 2015). The largest landings of *Coryphaena hippurus* worldwide occur in the South-East Pacific and in particular the Peruvian fishery is the largest dolphinfish fishery in the world. In the EEZ of both Peru and Ecuador, dolphinfish is an important fishery resource captured by local artisanal fleets using drifting longlines. The dolphinfish Peruvian and Ecuadorian fisheries are clearly the largest dolphinfish fisheries worldwide, accounting for nearly 50% of worldwide total catches since 2013 (Roa-Ureta et al., 2022).





Figure 7.2.1.2 – Worldwide, Peru and Ecuador dolphinfish (*Coryphaena hippurus*) total catch (top), and difference between catch data used in the stock assessment and in the FAO databases for Peru (middle) and Ecuador (bottom) (Roa-Ureta et al., 2022).

Stock identity

Lasso & Zapata (1999) suggested the existence of only one stock in the Gulf of Panama and that it is related to the previously established stock for Costa Rica, Colombia, and Ecuador. According to IATTC (2016) genetic studies show no evidence of a stock separation is the Eastern Pacific Ocean, with dolphinfish showing high genetic variability. The following text is based on IATTC (2016) based on several authors research: in the equatorial region off Colombia there is evidence that two different groups of dorado visit the area: fish caught at the peak of the season have different allele frequencies than those caught in the off-season, where there might be a resident group and a transient group in those waters. In the Gulf of California, high genetic variability was detected and no evidence of population separation. In Ecuadorian waters there is evidence of only one panmictic population.

In summary, it seems that there is only one population in the EPO, although there might be an oceanic component of the stock that moves closer to the coast seasonally, and a coastal resident component in some areas. The latter would be located slightly north of the Equator, while the oceanic component would migrate to coastal areas of the EPO around October-November for feeding and spawning (7.2.1.3, IATTC, 2016). Stock identity for this species in the Eastern Pacific Ocean is still an ongoing debate, but for the purpose of stock assessment and management the stock boundaries are considered between Peru and Ecuador EEZs and international waters (Southeast Pacific Ocean).





Figure 7.2.1.3 - Conceptual model of the movements and spatial distribution of dolphinfish (Aires-da-Silva *et al.* 2016).

Stock assessment & reference points

There has been an exploratory assessment of the stock of *Coryphaena hippurus* in the Southeast Pacific by Aires-da-Silva et al. (2016), namely within the Peruvian and Ecuadorian EEZs, using a length-structured model with monthly time steps and CPUE indices of relative abundance in the Stock Synthesis package. The assessment was fitted to sexcombined length-composition data from Peru and purse-seine bycatch and sex-specific length-composition data and CPUE from Ecuador from 2007-2014. The monthly time step allowed depletion caused by catches (from Peru and Ecuador, and the purse-seine bycatch) and measured by the CPUE to inform the estimates of absolute abundance (IATTC, 2019). The exploratory assessment included several parameters fixed at arbitrary values chosen by the analysts, such as the natural mortality rate, the steepness of the stock-recruitment relationship, and other parameters that resulted in giving more weight to specific pieces of data (Roa-Ureta et al., 2022). Aires-da-Silva et al. (2016) have characterized the stock dynamics as highly productive, variable and fast, and concluded that recent catches (up to June 2015) were close to the estimated MSY but that the fishing mortality that yields the MSY is undefined due to a flat yieldper-recruit curve. The preliminary assessment estimated an annual F of between 0.53 and 0.85 during 2007-2014, while M was assumed to be 1

In 2022, the dolphinfish stock in the Southeast Pacific was re-evaluated, again at a regional scale of the Peruvian and Ecuadorian ZEE, considering four longline artisanal fisheries, two for each country: an artisanal (operates in coastal and oceanic waters in the EEZ) and a fibreglass (operates in coastal waters only) fleet. The assessment used a monthly depletion estimator based on exponential decay model (generalised depletion model) in order to account for the very specific characteristics of the stock and fisheries which are based on a single cohort (assessment based on the effort catch dynamics). The results where then used in a surplus production model to provide management advice and estimate potential reference points (assessment then based on aggregate biomass dynamics). The model used monthly total catch, monthly total effort, and sampled mean monthly weight for the period between January 2004 and December 2019 (Roa-Ureta et al., 2022).

Regarding reference points, a review of possible candidates was carried out by IATTC (2019), where biomass, fishing mortality and empirical reference points (CPUE and length based) were considered and discussed. The authors reflect



that if target reference points were to be based on yield-per-recruit (YPR) considerations, it would be more appropriate to use $F_{0.1}$ (the fishing mortality corresponding to 1/10th the slope of the YPR curve at the origin) than F_{MSY} , given the flatness of the production curve, or could also be based on empirical considerations, such as a level of CPUE reduction relative to CPUE at a fixed date at the beginning of the season. For limit reference points (LRP) there is no conclusive evidence supporting a particular LPR, while LRPs could be based empirically, on the lowest historical within-year CPUE reduction or on a percentile such as the lowest 5%. Roa-Ureta et al. (2022) refers the results obtained by Patterson (1992) that shows that for stocks with the life history of small pelagic fish instantaneous exploitation rates less than 40% maintain a stable and sustainable spawning biomass. Although dolphinfish is not a small pelagic Roa-Ureta et al. (2022) considers that it has a similar life history as small pelagic fish and therefore concludes that 0.4 can be used as a proxy reference point.

The 2022 assessment showed that the dolphinfish stock in the Southeast Pacific has a high intrinsic rate of population growth (r) making it a resilient stock, that may recover quickly from low biomass, high mortality rate and fast biomass production function. The authors conclude that the stock is not overfished and not experiencing overfishing, but contrary to the results of Aires-da-Silva et al. (2016) where the harvest rate was close to MSY, the current harvest is found to be well below maximum sustainable harvest rates. The difference between the stock assessment results can be due to natural mortality, where the natural mortality rate obtained by Roa-Ureta et al. (2022) is very high and more than 3 times higher (0.339 per month) than the value assumed by Aires-da-Silva et al. (2016), although other factors such as different fisheries data time-series used could also have impacted the results.





Figure 7.2.1.4 – Depletion model results for the dolphinfish (*Coryphaena hippurus*) in the Southeast Pacific: aggregate exploitation rate for each fleet and in total (top), instantaneous exploitation rate per fleet and in total (middle) and stock biomass and catch in weight (bottom) (Roa-Ureta et al., 2022).

The Pella-Tomlinson production model results show that the MSY estimate is very high, six times higher than the average catch of the four fleets over the time series. This is because the stock has a fluctuating dynamic and therefore the authors conclude MSY is not applicable. Both the estimated intrinsic rate of population growth r and the symmetry of the production function p are high, making the stock highly productive. Overall, stock biomass shows marked fluctuation about a constant mean close to 350 thousand tonnes.



Figure 7.2.1.5 - November stock biomass estimated by generalized depletion model, total annual catch by four artisanal longline fleets, and fitted Pella-Tomlinson model of population dynamics of the dolphinfish in the Southeast Pacific (Peru and Ecuador) (Roa-Ureta et al., 2022).

Table 7.2.1.1- Parameters from the Pella-Tomlinson model (r, p and K) and derived biological reference points (MSY and B_{MSY}) for dolphinfish in the Southeast Pacific (Peru and Ecuador) (Roa-Ureta et al., 2022).

Parameter	Concept	Estimate	Standard error	$\mathbf{CV}\ (\%)$
$r (\mathrm{yr}^{-1})$	Intrinsic growth rate	2.7783	1.96450	70.7
p	Production function symmetry	2.2063	0.61208	27.7
K (tonnes)	Environmental carrying capacity	456,960	187,860	41.1
B_{2003} (tonnes)	Initial biomass	209,590	142,470	68.0
MSY (tonnes)	Maximum sustainable yield	360,225	194,422	54.0
B_{MSY} (tonnes)	Biomass at MSY	237,131	102,124	43.1
\dot{P} (tonnes)	Average total latent productivity	$152,\!980$	562,595	367.8
$B_{\dot{P}}$ (tonnes)	Average biomass at \dot{P}	349,218	238,525	68.3

Stock status

The 2022 assessment (Roa-Ureta et al., 2022) showed that the dolphinfish stock in the Southeast Pacific stock is not overfished and not experiencing overfishing. Exploitation rates were well within sustainable levels for the whole length of the time series 2004-2019, i.e. below 0.4 (middle graph, figure 7.2.1.3). The stock has a high intrinsic rate of population growth and asymmetric biomass production function, making it resilient and prone to undergo large fluctuations in biomass. Biomass in 2020 was estimated to be almost 400,000 tonnes although uncertain, while the lowest biomass of the time series (B_{loss}) was around 75,000 tonnes in 2016 (figure 7.2.1.4).



Finally, the mean total latent productivity (i.e. possible sustainable yield) was evaluated at 152,980 tonnes per year, double the average catch of the four fleets over the time series (around 75,000 tonnes, Figure), though the estimate is uncertain.

Harvest strategy & control rules

As dolphinfish is a highly migratory species, its management should normally be considered at international level at Regional Fisheries Management Organisations (RFMO). The IATTC has jurisdiction over the eastern Pacific Ocean but does not recognised dolphinfish as a species under its responsibility, although it has provided scientific support to compile catch information and assess the status of the Southeast Pacific dolphinfish stock at the request of Peru and Ecuador. In this context, IATTC facilitated collaborative regional research that resulted in three annual regional workshops on dolphinfish during 2014-2016. The dolphinfish Southeast Pacific fishery is therefore expected to be managed bilaterally and nationally by Peru and Ecuador. In 2014, Peru and Ecuador signed a Memorandum of Understanding (MOU), with the objectives of cooperating in terms of science, data collection, and also to strengthen capacities and exchange experiences regarding the management of the dolphinfish fishery. In this context, both countries organised a series of meetings and workshops between 2015-2022 to inform and discuss management measures for the stock, to incorporate fisheries data and to perform a combined analytical assessment of the stock (finalised in 2022), with the participation of Ecuador's IPIAP and Peru's IMARPE, but also of MPCEIP, PRODUCE and NGOs (for more details see section 7.4.1.4).

At national level, the Ecuadorian Ministerial Agreement No. 023 of February 14, 2011, established the National Action Plan for the conservation and management of the dolphinfish 2011-2016 as a tool that provided guidelines for the conservation, management and eco-certification of dolphinfish. In December 2019 the National Action Pan for this species was renewed for the period 2019-2024 (No. MPCEIP-SRP-2021-0145-A in June 2021), after an evaluation of the previous plan. The 2019 evaluation identified the following points to be improved: improve organizational structure, increase regulations to implement measures, ensure finance mechanism, ensure active advisory board, increase stakeholders participation, include specific deadlines for carrying out activities, and finally strengthen the technical capabilities of the team. The National Action Plan (hereinafter "PAN Dorado") is implemented since 2011 through several regulations that establish specific management measures (Agreement 070/2011, Resolution 245-2014), such as a minimum size (80 cm with a 10% bycatch allowance), closed season to the targeted fishery to protect recruitment (1 July until 7 October), characteristics of fishing gear (hook type and size), permitted vessels and establishes (2011) and increases the coverage (from 2021) of the observer program.

Also in Peru, a National Action Plan for the conservation and management of dolphinfish (PAN-Perico) was established, and aims to ensure the sustainable management of the dolphinfish fishery, establishing objectives and activities in the medium and long-term. The Ministerial Resolution No. 249-2011-PRODUCE of September 2, 2011, establishes minimum catch sizes and maximum tolerance of juveniles catches of several marine species, among them dolphinfish. Minimum catch size is 70 cm fork length and the maximum tolerance of juveniles catches is 10%. The Ministerial Resolution No. 245-2014-PRODUCE of July 11, 2014, establishes the dolphinfish fishing season from October 1 to April 30 and the closed season from May 1 to September 30 of each year. Supreme Decree No. 17-2021-PRODUCE establishes an annual Maximum Total Catch Limit based on scientific advice, and a prohibition of discarding, although the values of the MTCL established for 2022 and 2023 are unclear.

Management Strategy Evaluation

A simplified version of the SS model used for the exploratory assessment (Aires-da-Silva et al. 2016) was used as the operating model for an MSE (Valero et al. 2016). The exploratory work focused on testing the management strategy in place, which is based on seasonal closures, and alternatives including different monthly fishery closures and openings, size limits for the fish in the catch, and discard mortality rates. There were trade-offs between spawning biomass ratio (SBR) and yield for strategies based on alternative season openings, closures, and minimum size limits with different assumptions regarding discard mortality rates of undersized fish. Alternative season closures and openings have similar general effects on SBR and total yield; later season openings, however, increase SBR without marked reductions in expected yield, while earlier closures increase SBR but at the expense of reduced catch. YPR analyses show that the age of entry that will produce the maximum YPR is around 10 months, based on the annual fishing mortalities estimated by the assessment. That would mean that openings around October-November would be consistent with YPR considerations. The age of entry consistent with maximum YPR would be higher at fishing mortalities higher than those estimated by the assessment. SBR is expected to increase with minimum size limits, while yield is expected to increase with no or moderate discard mortality and to decrease with greater discard mortality. Under assumed moderate discard mortality and to decrease with greater discard mortality. Under assumed moderate discard mortality and to decrease with greater discard mortality. Inder assumed moderate discard mortality and to decrease with greater discard mortality. Inder assumed moderate discard mortality and to decrease with greater discard mortality. Inder assumed moderate discard mortality and to decrease with greater discard mortality. Inder assumed moderate discard mortality and to decrease with greater discard mortality. Inder assumed moderate dis

7.2.2 Catch profiles

Figure 7.2.2.1 shows that annual landings (in metric tons) of dolphinfish made by the Ecuadorian longline fleet targeting dolphinfish using LL-DOL, based on data collected by the inspectors at ports and provided by the SRP.



Figure 7.2.2.1. Annual landings (in metric tons) of dolphinfish made by the Ecuadorian longline fleet targeting dolphinfish using LL-DOL. Figure prepared by the using using landing data provided by the SRP.

7.2.3 Total Allowable Catch (TAC) and catch data

Table 7.1.3.1 – Total Allowable Catch (TAC) and catch data					
TAC	Not applicable				
	2019	2020	2021	2022(*)	
UoA share of TAC	N/A	N/A	N/A	N/A	
UoA share of total TAC	N/A	N/A	N/A	N/A	
Total green weight catch by UoC	3271,1	2850,3	5440,9	867,1	

(*) Uncomplete annual data series

7.2.4 Principle 1 Performance Indicator scores and rationales

PI 1.1.1 – Stock status

PI 1	1.1.1	The stock is at a level which recruitment overfishing	n maintains high productivity	and has a low probability of
Scoring	g Issue	SG 60	SG 80	SG 100
а	Stock sta	atus relative to recruitment ir	mpairment	



	Guide post	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
	Met?	Yes	Yes	Yes
Ration	ale			

The 2022 assessment showed that the dolphinfish stock in the Southeast Pacific is not overfished and not experiencing overfishing, while the 2020 biomass (around 400,000 tonnes) is estimated to be more than 5 times the lowest observed biomass B_{loss} and 1.69 times B_{MSY} (237,131 tonnes). **All SG60, 80 and 100 are met.**

	Stock sta	atus in relation to achieveme	ent of Maximum Sustainable	e Yield (MSY)
b	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		Yes	Νο
Rationa	ale			

As stated above, the 2022 assessment showed that the dolphinfish stock is not overfished and not experiencing overfishing. Exploitation rates were well within sustainable levels for the whole length of the time series 2004-2019, while biomass was variable around 350,000 tonnes. Furthermore, the 2020 biomass (around 400,000 tonnes) is estimated to be more than 5 times the lowest observed biomass B_{loss} and 1.69 times B_{MSY} (237,131 tonnes). Therefore the team considers that the stock is at MSY levels and SG80 is reached. However, as there is uncertainty in the assessment and particularly in the most recent biomass estimates, SG100 is not reached.

References

Roa-Ureta, RH, Amancio, GR, Abanto, PM, Izquierdo, IG, Sior, AAN, Elías, E, Peralta, M. 2022. Stock Assessment of the dolphinfish (*Coryphaena hippurus*) in the South-East Pacific Ocean. IATTC Doc SAC-13 INF-O. 40 pp.

Stock status relative to reference points

	•		
	Type of reference point	Value of reference point	Current stock status relative to reference point
Reference point used in scoring stock relative to PRI (SIa)	B _{loss} = B ₂₀₁₆	Around 75,000 tonnes	B_{2020}/B_{loss} = around 5.33
Reference point used in scoring	BMSY	237,131 tonnes	B ₂₀₂₀ /B _{MSY} = around 1.69
stock relative to MSY (SIb)	F/Z = F _{MSY} proxy	0.4	F ₂₀₂₀ /F _{MSY} proxy = <1

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

Draft scoring range	≥80
Information gap indicator	More information sought on stock assessment result numbers behind figures and on the reference points considered.



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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 1.2.1 – Harvest strategy

PI 1.	2.1	There is a robust and precaut	ionary harvest strategy in plac	e	
Scoring Issue		SG 60	SG 80	SG 100	
	Harvest	strategy design			
а	Guide post	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.	
	Met?	Yes	No	No	
Rationale					

Dolphinfish as a highly migratory species should be managed under an international agreement between the jurisdictions where it occurs. Although the IATTC has jurisdiction over the eastern Pacific Ocean it does not recognised dolphinfish as a species under its responsibility.

Therefore, the dolphinfish Southeast Pacific fishery is expected to be managed bilaterally and nationally by Peru and Ecuador. The MoU signed between Peru and Ecuador in 2014 establishes a framework of collaboration between the two countries in terms of management and science. The stock and the fisheries are monitored by both countries and a common stock assessment has been conducted by researchers from both national fisheries research institutions

Each country has its own management plan for the species and fishing restrictions consisting of a licencing scheme, closed seasons, fishing gear restrictions and a minimum size, but these measures are not fully aligned between countries, for example the closed seasons overlap but are not exactly the same while the minimum size is measured differently between countries, and also the authorised hook types. Nevertheless, the stock is considered to be at MSY while the harvest strategy has been tested by MSE and is expected to maintain stock management objectives.

In summary, it is the team opinion that the MOU and the implemented collaboration between both countries in terms of research and assessment and in creating a management dialogue, while the management measures are similar and are achieving stock management objectives, constitute sufficient elements to be considered a management strategy at stock level **and SG60 is reached**. However, there is no information if the elements of the harvest strategy are responsive to the state of the stock and **therefore SG80 is not met**.

	Harvest	strategy evaluation		
b	Guide post	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Yes	Yes	No
Ration	ale			

A closed season, a licencing scheme, minimum catch size and fishing restriction can work to limit fishing mortality, even if catches are not necessarily limited. Furthermore, the 2022 assessment showed that the dolphinfish stock is not



overfished and not experiencing overfishing. Exploitation rates were well within sustainable levels for the whole length of the time series 2004-2019, while biomass was variable around 350,000 tonnes, estimated to be 1.69 times B_{MSY}. **Therefore both S60 and S80 are met**. In addition, the harvest strategy based on closed seasons and minimum sizes has been evaluated trough MSE and found to be consistent with management objectives. However, the MSE was considered preliminary based on a previous exploratory assessment and therefore the performance of the harvest strategy cannot be considered to be fully evaluated and **SG100 is not met**.

	Harvest	strategy monitoring
С	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.
	Met?	Yes
Ration	ale	

As stated above, the stock and the fisheries are monitored by both countries and a common stock assessment based on the data collected and compiled is conducted by researchers from both national fisheries research institutions. The fisheries landings are monitored at landing sites, while there is an observer program implemented since 2011 in the Ecuadorian fishery. Therefore, some monitoring in place that can determine whether the harvest strategy is working **and SG60 is reached.**

d	Harvest strategy review		
	Guide post		The harvest strategy is periodically reviewed and improved as necessary.
	Met?		No
Rationale			

The Ecuadorian PAN Dorado was reviewed in 2019, while the levels of at sea monitoring trough the observer program were also reviewed and updated in 2021. Therefore, some elements of the harvest strategy are reviewed and improved as necessary. However, there is no information if other the elements of the harvest strategy, such as the specific management measures taken like the minimum size or the closed season are reviewed periodically and thus SG100 is not reached.

е	Shark fir	Shark finning				
	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.		
	Met?	NA	NA	NA		
Ration	ale					

Not applicable to this fishery as sharks are not targeted.

f Review of alternative measures



	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of the target stock.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	Yes	No	No
Ration	ale			

There is a minimum catch size in both countries (70 cm in Peru and 80 cm in Ecuador) and a prohibition to discard in Peru, but the level of catches under the minimum size is unknown in both countries, although there is information that unwanted catch does occur. However, there are closed seasons set in recent years to protect juveniles and size and type of hooks used, and therefore the team considers that the establishment of these measures can be considered a review of alternative measures to reduce UoA unwanted catches **and SG60 is met**. Since there is no information if the effectiveness of the minimum catch size or the close season are reviewed, **SG80 is not met**.

References

Ecuadorian Ministerial Agreement No. 023 of February 14, 2011 and No. MPCEIP-SRP-2021-0145-A in June 2021

IATTC. 2019. Status of the Tuna and Billfish Stocks in 2018. Stock Assessment Report 20. 142 pp.

Peruvian Ministerial Resolution No. 249-2011-PRODUCE, Resolution No. 245-2014-PRODUCE, Supreme Decree No. 17-2021-PRODUCE

Roa-Ureta, RH, Amancio, GR, Abanto, PM, Izquierdo, IG, Sior, AAN, Elías, E, Peralta, M. 2022. Stock Assessment of the dolphinfish (*Coryphaena hippurus*) in the South-East Pacific Ocean. IATTC Doc SAC-13 INF-O. 40 pp.

Valero, J. L., Aires-da-Silva, A., Maunder, M. N., Minte-Vera, C., Martínez-Ortiz, J., Torrejón-Magallanes, E. J. and Carranza, M. N. 2016. Exploratory management strategy evaluation (MSE) of Dorado (*Coryphaena hippurus*) in the south Eastern Pacific Ocean. Inter-American Tropical Tuna Commission, Scientific Advisory Committee, Seventh Meeting.

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

Draft scoring range	60-79
Information gap indicator	More information sought on the harvest strategy by both Peru and Ecuador, general fisheries law objectives and review of UoA alternative measures to minimize mortality of unwanted catch.

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 1.2.2 - Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
	HCRs de	esign and application		
а	Guide post	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	Met?	No	No	Νο
Defiencle				

Rationale

There are no generally understood harvest control in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment is approached. Although the fishery has limitations on the fishing season, and size limits, these are not established within a specific framework, are not harmonized between countries, and do not reduce exploitation when stock biomass decreases. Peru has the legal provision to establish an annual Maximum Total Catch Limit but it is unclear if it was indeed established for 2022 and 2023, and based on what rules. Therefore, **SG60 is not reached.**

	HCRs robustness to uncertainty		
b	Guide post	The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?	No	Νο
Ration	ale		

As there are no HCRs SG80 is not reached.

	HCRs evaluation				
с	Guide post	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.	
	Met?	Yes	No	No	
Rationale					



By limiting the season, licences and catch sizes the fishery is somewhat limited and the fishery has never significantly expanded, while the stock is not considered to be subject to overfishing, and **thus SG60 is reached but it is not sufficient to reach SG80** as there is no explicit HCR.

References

Roa-Ureta, RH, Amancio, GR, Abanto, PM, Izquierdo, IG, Sior, AAN, Elías, E, Peralta, M. 2022. Stock Assessment of the dolphinfish (*Coryphaena hippurus*) in the South-East Pacific Ocean. IATTC Doc SAC-13 INF-O. 40 pp.

Ecuadorian Ministerial Agreement No. 023 of February 14, 2011 Ecuadorian Ministerial Agreement MPCEIP-SRP-2021-0145-A in June 2021

Peruvian Ministerial Resolution No. 249-2011-PRODUCE, Resolution No. 245-2014-PRODUCE, Supreme Decree No. 17-2021-PRODUCE

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

Draft scoring range	<60
Information gap indicator	More information sought on management measures in place in both countries.

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy			
Scoring Issue		SG 60	SG 80	SG 100	
	Range o	of information			
a	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.	
	Met?	Yes	Yes	No	
Rationale					

Information on catch and effort, length structure, growth, maturity and fleet composition are all available for the dolphinfish stock in Southeast Pacific. The majority of catches, area of occurrence, and area of operation of the fishery are sampled on a regular basis. Therefore sufficient information is known to support the harvest strategy **and both SG60 and SG80 are reached.** Environmental information, namely the impact of sea surface temperature and temperature fronts on the distribution and abundance of dolphinfish is also available. However, stock structure is still unclear while there is no length-weight relationship from the Ecuadorian fleets catch. Therefore, a comprehensive range of information is not available to support the harvest strategy and SG100 is not met.

	Monitoring			
b	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Yes	Yes	No
Rationale				

UoA caches are regularly monitored, and there are four CPUEs series available from the Ecuador and Peru artisanal longline fisheries that are used in the stock assessment. Length and maturity estimates are derived mainly from samples collected by the Peruvian and Ecuadorian sampling schemes. So all information required by a harvest control rule is regularly monitored with high frequency and thus **both SG60 and S80 are reached.** However, while there is no length-weight relationship for Ecuadorian catch data and the knowledge of uncertainty in the data and its impact on the stock assessment needs further study, **SG100 is not met.**

c Comprehensiveness of information

	Guide post	There is good information on all other fishery removals from the stock.
	Met?	Yes
Ration	ale	

Dolphinfish is caught as a bycatch to seine fisheries but this fleet is also routinely sampled and accounts only for 2% of total dolphinfish catches. Thus the team concludes there is good information on all other fishery removals from the stock and **SG80 is reached**.

References

IATTC. 2019. Status of the Tuna and Billfish Stocks in 2018. Stock Assessment Report 20. 142 pp.

Roa-Ureta, RH, Amancio, GR, Abanto, PM, Izquierdo, IG, Sior, AAN, Elías, E, Peralta, M. 2022. Stock Assessment of the dolphinfish (*Coryphaena hippurus*) in the South-East Pacific Ocean. IATTC Doc SAC-13 INF-O. 40 pp.

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

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI but more information sought on the Peru and Ecuador sampling schemes. It would also be valuable to get more details on how the contributions of gillnet artisanal fisheries of dolphinfish catches are monitored and taken into account.

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 1.2.4 – Assessment of stock status

ΡI	1.2.4	There is an adequate assessment of the stock status			
Scoring Issue		SG 60	SG 80	SG 100	
а	Appropr	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.	
	Met?		Yes	No	
Rationale					

The dolphinfish stock in Southeast Pacific was assessed by Roa-Ureta et al. (2022) based on a generalised depletion model, where the results are then used in a surplus production model to provide management advice and estimate potential reference points. The depletion model uses monthly total catch, monthly total effort, and sampled mean monthly weight, and considers the stock natural mortality and fishery selectivity. Therefore, assessment is appropriate for the stock and for the harvest control rule **and SG80 is met**. However, different growth between different fleets is not considered due to the lack of length-weight data, while Ecuadorian fleets seem to catch larger fish, and thus major features of the nature of the UoA are not taken into account in the assessments. Furthermore, age or length stock structure is not taken into account, as well as maturity **and thus SG100 is not met**.

	Assessment approach			
b	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Yes	No	
Ration	ale			

The assessment carried out by Roa-Ureta et al. (2022) using a generalised depletion and surplus production models estimates stock status relative to reference points, namely F/Z as a F_{MSY} proxy and B_{MSY} and therefore there are to generic reference points appropriate to the species category **and SG60 is met**. However, the authors refer that MSY reference points are not necessarily appropriate for the stock since dolphinfish behaves as a small pelagic fish, a conclusion also reached by Ayres-da-Silva et al. (2016), and for this reason **SG80 is not met**.

	Uncertainty in the assessment			
с	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes	Yes	Νο
Ration	ale			

The assessment identifies major sources of uncertainty in the catch data, particularly in the estimated catch weight of the Ecuadorian fleets and takes it into account in the ability of the depletion model fit those fleets, **and as such SG60 and SG80 are met**. The assessment also estimates stock status in a probabilistic way relative to reference points as biomass is estimated with standard deviations. **Therefore SG100 is also reached.**


	Evaluati	on of assessment	
d	Guide post		The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?		Νο
Ration	ale		

The dolphinfish stock was previously assessed by Ayres-da-Silva et al. (2016). Although both stock assessments conclude that the stock is not overfished and not experiencing overfishing, there are conflicting results regarding the harvest rate and its proximity to maximum sustainable rates. Furthermore, the depletion model assessment has not been tested for alternative hypothesis. For these reasons **SG100 is not met.**

	Peer review of assessment				
е	Guide post	The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.		
	Met?	No	No		
Ration	ale				

The assessment carried out by Roa-Ureta et al. (2022) was presented to the 13th meeting of the IATTC Scientific Advisory Council. However, the assessment team has no information regarding if the stock was peer reviewed in this meeting, or at any other occasion either internally or externally. **SG80 is not met.**

References

Aires-da-Silva, A, Valero, J, Maunder, M, Minte-Vera, C, Lennert-Cody, C, Román, M, Martínez-Ortiz, J, Torrejón-Magallanes, E, Carranza, M. 2016. Exploratory stock assessment of dorado (*Coryphaena hippurus*) in the southeastern Pacific Ocean. IATTC Tech. Rep. Document SAC-07-06a(i).

Roa-Ureta, RH, Amancio, GR, Abanto, PM, Izquierdo, IG, Sior, AAN, Elías, E, Peralta, M. 2022. Stock Assessment of the dolphinfish (*Coryphaena hippurus*) in the South-East Pacific Ocean. IATTC Doc SAC-13 INF-O. 40 pp.

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

Draft scoring range	60-79					
Information gap indicator	More assess	information ment review pro	sought ocess.	on	the	stock

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

Overall Performance Indicator score	
Condition number (if relevant)	



7.2.5 Principle 1 references

Aires-da-Silva, A, Valero, J, Maunder, M, Minte-Vera, C, Lennert-Cody, C, Román, M, Martínez-Ortiz, J, Torrejón-Magallanes, E, Carranza, M. 2016. Exploratory stock assessment of dorado (Coryphaena hippurus) in the southeastern Pacific Ocean. IATTC Tech. Rep. Document SAC-07-06a(i).

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- Martínez-Ortíz, J. & Zúñiga-Flores, M. 2012. Current state of knowledge of the resource (Coryphaena hippurus) Linnaeus, 1758 in Southeast Pacific Ocean (2008-2011). Final Technical Report of the project entitled: "Dynamics of the population: fisheries and fish biology of the mahi mahi in Ecuador".
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- MPCEIP, 2019. Plan de Acción Nacional para la conservación y el manejo del recurso dorado en Ecuador (PAN Dorado 2019-2024). MPCEIP, Ecuador. 47pp.
- Roa-Ureta, RH, Amancio, GR, Abanto, PM, Izquierdo, IG, Sior, AAN, Elías, E, Peralta, M. 2022. Stock Assessment of the dolphinfish (Coryphaena hippurus) in the South-East Pacific Ocean. IATTC Doc SAC-13 INF-O. 40 pp.
- Valero, J. L., Aires-da-Silva, A., Maunder, M. N., Minte-Vera, C., Martínez-Ortiz, J., Torrejón-Magallanes, E. J. and Carranza, M. N. 2016. Exploratory management strategy evaluation (MSE) of Dorado (*Coryphaena hippurus*) in the south Eastern Pacific Ocean. Inter-American Tropical Tuna Commission, Scientific Advisory Committee, Seventh Meeting.



7.3 Principle 2

7.3.1 Principle 2 background

7.3.1.1 UoA catch composition: species assignment to MSC P2 categories

The species to be assessed under P2 are those coming on board which are not covered under P1. MSC FCP SA3.1.2 sets that the team shall consider each P2 species within only one of the primary species, secondary species or ETP species components, following SA3.1.3-3.1.5 and SA3.4.4-3.4.5.

I. Sources of information and P2 terminology in relation to species components

Before categorizing P2 species it is important to indicate the different sources of information used by the team to assess the species impacted by the fishery.

The different sources of information used by the team to identify and classify the different species components and subcomponents to be assessed against P2 are presented and discussed below.

a) Catch data reported to IATTC

The IATTC has public domain data for download (click <u>here</u> to access the website). Table below shows all longline landings reported by Ecuador to the IATTC between 2007 and 2021 (with the exception of 2018 and 2019). Dolphinfishes (including both Coryphaena hippurus and Coryphaena equiselis) account for only 41% of the total landings, followed by various sharks (22,3%), swordfish (8,4%), billfishes (8,3%), yellowfin tuna (7,6%), skipjack (5,6%) and bigeye tuna (2,5%). Unfortunately, this data does not provide enough detail for being used in this assessment since does allow identification to species level in the case of Coryphanea and, more importantly, does not differentiate between the two types of longline used by the fleet: LL-DOL and LL-TBS (see section 5.1.3 for more details). Thus, this information is NOT used to classify the P2-species according to the MSC requirements (see subsection II below).

Table 7.3.1.1. landings by species of the Ecuadorian longline fleet (using LL-DOL and LL-TBS). Data reported by Ecuador to the IATTC. Table prepared by the team based on data retrieved from the IATTC dataset: <u>EPO total estimated</u> <u>catch by year, flag, gear, species</u>.

	ASLIS													
Spp	Code	2007	2008	2009	2010	2011	2012	2013	2015	2016	2020	2021	TOTAL	%
Albacore	ALB								219	191	62		472	0,3%
Bigeye tuna	BET	8	372	723	852	529	472	330	159	483	213	87	4228	2,5%
Billfishes	BIL	1064	1511	1771	2492	2336	2090	2666	51	98	245	4	14328	8,3%
Black skipjack	BKJ	2		2	8	6	5	10					33	0,0%
Blue marlin	BUM											48	48	0,0%
Bonitos nei	BZX	2	6	8	2	10	1	13					42	0,0%
Dolphinfishes nei	DOX	3925	11030	12235	7226	10210	14464	9297	16	3	1612	456	70474	41,0%
Striped marlin	MILS	262	280	315	424	339	261	422	24	21		49	2397	1,4%
Unidentified fishes	MZZ	54	171	433	320	195	291	161	136	396	144	87	2388	1,4%
Indo-Pacific sailfish	SFA	102	141	133	337	329	311	307	3	3		5	1671	1,0%
Various sharks nei	SKH	1656	6815	7389	10927	10811				735			38333	22,3%
Skipjack tuna	SKJ	131	1131	1405	1682	1253	2200	1874	0	7		0	9683	5,6%
Rays, Skates, nei	SRX	2	2	14	121	0					9		148	0,1%
Shortbill spearfish	SSP			2			0		4	2			8	0,0%
Swordfish	SWO	49	630	1165	595	1072	1656	1401	1083	1462	3144	2246	14503	8,4%
Tunas nei	TUN											25	25	0,0%
Yellowfin tuna	YFT	288	1750	2189	1937	1830	2581	1945	102	212	216	93	13143	7,6%
TOTAL		7545	23839	27784	26923	28920	24332	18426	1797	3613	5647	3101	171927	



b) Landings (data from MPCEIP, 2022a)

Table 7.3.1.2 shows the landing volumes per species from a total of 152 Fisheries Landing Control and Monitoring Certificates (CMCDP) issued by Fisheries Inspectors of the Fisheries Control Directorate (DCP) during the year 2020 (MPCEIP, 2022a). According to MPCEIP (2022a), these landings are specific to mother-ship based fishing operations using exclusively the 'thin longline' or 'doradero' (LL-DOL). However, these landings only cover 3 months: October, November, December.

The results show that, when the 'doradero', dolphinfish accounts for 91% of the total landed volume, followed by blue shark (5,8%). All other species accounted for less than 1% of the total landed volume. All landed species are either dolphinfish, tunas (yellowfin tuna, wahoo), billfishes (swordfish, blue marlin, striped marlin, Indo-Pacific sailfish), or pelagic sharks (blue shark, shortfin mako shark, pelagic and bigeye thresher sharks, silky shark, blacktip shark).

Table 7.3.1.2 Landing volumes per species from a total of 152 Fisheries Landing Control and Monitoring Certificates (CMCDP) issued by Fisheries Inspectors of the Fisheries Control Directorate (DCP) in October, November and December 2020. Landings are specific to mother-ship based fishing operations using LL-DOL. Source: Table elaborated by the team based on data presented in MPCEIP, 2022a

Common name	Scientific name	ASFIS code	kt	%
Dolphinfish	Coryphaena hippurus	DOL	2880,97	91,0%
Blue shark	Prionace glauca	BSH	182,4	5,8%
Pelagic thresher shark	Alopias pelagicus	PTH	30,03	0,9%
Shortfin mako shark	Isurus oxyrinchus	SMA	15,29	0,5%
Silky shark	Carcharhinus falciformis	FAL	8,73	0,3%
Blue marlin	Makaira nigricans	BUM	4,76	0,2%
Bigeye thresher shark	Alopias superciliosus	BTH	4,59	0,1%
Swordfish	Xiphias gladius	SWO	30,6	1,0%
Striped marlin	Kajikia audax	MILS	2,77	0,1%
Yellowfin tuna	Thunnus albacares	ALB	2,74	0,1%
Indo-Pacific sailfish	Istiophorus platypterus	SFA	2,32	0,1%
Wahoo	Acanthocybium solandri	WAH	0,05	0,0%
Blacktip shark	Carcharhinus limbatus	CCL	0,04	0,0%
			3165,29	

c) Landings (data provided by the MPCEIP)

As already mentioned above, the data presented in MPCEIP (2022a) cover only 3 months of 2020 (Oct-Dec). At the request of the team, the client asked the MPCEIP to prepare a more complete historical series. As a result of this consultation, the data presented in **table 7.3.1.3** were obtained. This table presents the landing volumes per species specific to mother-ship based fishing operations using LL-DOL between 2013 and 2021, based on Fisheries Landing Control Monitoring Certificates (CMCDP) issued by the fishery inspectors.

The bony fish species account for more than 90% of the total volume landed per year (92-99%), with sharks and rays accounting for the remaining 1-8%. However, in 2016 the contribution of sharks increased up to 43% of the total volume landed per year. Normally, the target species accounts for over 88% of the total volume landed per year. However, in certain years this contribution might decrease significantly (e.g. 58% in 2016, 72% in 2018).

Most of the bony fish species landed account for less than 1% of the total volume landed per year. However, blue marlin (*Makaira nigricans*) and swordfish (*Xiphias gladius*) might account for a significant contribution to the total volume landed per year (e.g. blue marlin accounted for 15% in 2015, while swordfish accounted for 11% in 2018).

Among sharks and rays, the species that contributes most regularly to volume landed is the blue shark (*Prionace glauca*). The contribution of this species to the total volume landed per year ranges between 2 and 10%, with an average contribution of 4% between 2013 and 2021). Another shark species with significant contributions to the annual landed volume is the pelagic thresher shark (Alopias pelagicus), which on an average year might contribute to 2% of the landings. However, the contribution of this species peaked in 2016 to 29% of the total volume landed. That same year



the contribution of the silky year (*Carcharhinus falciformis*) to the total volume landed also peaked above 2%. The contribution of all the other shark and ray species to the total volume landed per year does not reach 0,5%.

Table 7.3.1.3. Landing volumes per species specific to mother-ship based fishing operations using LL-DOL between 2013-2021. Source: table elaborated by the MPCEIP based on Fisheries Landing Control Monitoring Certificates (CMCDP).

	1-						-		-		_		-								
Scientific name & ASCIS Code	Common name	201	3	2014	1	201	.5	203	6	201	.7	201	18	20	19	202	20	202	1	202	22
		t	%	t	%	t	%	t	%	t	%	t	%	t	%	t	%	t	%	t	%
	OSTEICHTHYES	6.556,05	95,3%	12.157,11	94,7%	4.457,49	92,2%	2.536,76	57,5%	5.694,84	95,0%	2.717,61	85,7%	3.272,56	98,7%	2.856,72	92,9%	5.606,89	92,2%	871,11	97,3%
Coryphaenidae																					
Coryphaena hippurus	Dolphinfish	6.472,7	94,1	11.355,7	88,5	4.240,9	87,7	1.255,3	28,4	5.376,2	89,7	2.277,3	71,8%	3.271,1	98,7%	2.850,3	92,7	5.440,9	89,5	867,1	96,8
Scombridae																					
Acanthocybium solandri (WAH)	Wahoo	6,0	0,1	7,8	0,1	4,8	0,1	16,5	0,4	2,1	<0,0	0,5	<0,0	0,2	<0,0			2,9	<0,0		
Thunnus albacares (YFT)	Yellowfin tuna	32,1	0,5	54,7	0,4	50,1	1,0	169,7	3,8	18,2	0,3	39,53	1,2%	0,41	<0,0	0,9	<0,0	32,7	0,5	1,4	0,2
Thunnus obesus (BET)	Bigeye tuna	9,3	0,1	0,9	<0,0	7,0	0,1	18,0	0,4	2,0	<0,0	13,05	0,4%	0,07	<0,0			1,6	<0,0		
Katsuwonus pelamis (SKJ)	Skipjack tuna	0,1	<0,0	18,3	0,1	1,8	<0,0	3,7	0,1	1,2	<0,0										
Euthynnus lineatus (BKJ)	Black skipjack			9.1	0.1			0.2	< 0.0	0.2	<0.0										
Sarda orientalis (BIP)	Striped bonito			0.1	<0.0			0.0	<0.0												
Istiophoridae					.,.			- / -							1						-
Istiompax indica (BLM)	Black marlin							0.2	<0.0	0.1	<0.0										
Istionhorus platynterus (SEA)	Indo-Pacific sailfish	03	<0.0	127.3	10	15.6	03	76.3	17	10.0	0.2	0.11	<0.0					10	<0.0		
Tetranturus angustirostris (SSP)	Shorthill spearfish	-,-			_,.	/-	-,-	0.1	<0.0		-,-	-,						_,=			
Kajikia audax (MILS)	Striped marlin	2.7	<0.0	54.9	0.4	14.2	0.3	132.9	3.0	39.6	0.7	2.79	0.1%	0.30	<0.0	0.8	<0.0	15.2	0.2	0.9	0.1
Makaira piaricans (BLIM)	Blue marlin	3.2	<0.0	440.9	3.4	51.7	1 1	640 1	14.5	70.5	1.2	21.90	0.7%	0,00	-0,0	1.5	<0.0	38.4	0.6	0,9	0,1
Xinbiidae		-/-							75	,.	-/-	,	•,		1	-/-			-/-	-/-	-/-
Xinhias aladius (SWO)	Swordfish	28.5	04	71 5	0.6	58.7	12	177.0	40	119 7	2.0	362 50	11 4%	0.47	<0.0	33	0.1	74 3	12	07	0.1
Gempylidae	Shoransh	20,5	0, 1	, 1,5	0,0	50,7	1,2	177,0	1,0	115,7	2,0	562,56	11, 170	0,17	-0,0	3,5	0,1	7 1,5	1,2	0,7	
Lenidocybium flavobrunneum (LEC)	Escolar (11	<0.0	15.9	0.1	12.6	03	46.8	11	55.2	0.9										
	CHONDRYCHTHYES	323 61	4 7%	680 54	5 3%	375 92	7.8%	1.878 22	42 5%	298 34	5.0%	226 61	7 1%	21.66	0.7%	218 84	7 1%	472 10	7.8%	24 37	2.7%
Aloniidae	enonbarennies	323,01	4,770	000,34	3,3/0	373,52	7,070	1.070,22	42,370	230,34	3,070	220,01	7,1/0	21,00	0,170	210,04	7,1/0	472,10	1,0/0	24,37	2,170
	Bologic throspor shork	1/15 1	21	266.0	2.1	107.0	2.2	1 260 2	29.5	66 5	11	19 1	1 5%	0 0	0.2%	29.1	0.0	97.7	14	2.2	0.4
Alopias superciliosus (BTH)	Bigeve thresher shark	3.0	<0.0	11 7	0.1	3.4	0.1	38.8	0.9	3.7	0.1	3.0	0.1%	0,0	<0.0	13	0,5	7.2	0.1	5,2	0,4
Alopias supercinosas (DTT)	Thresher shark	0.2	<0,0	11,7	0,1	3,4	0,1	0.2	<0.0	3,1	0,1	3,0	0,170	0,4	~0,0	-,5	0,1	7,2	0,1		
Carcharbinidae	The sher shark	0,2	-0,0	11,0	0,1			0,2	~0,0								I				
Carcharhinus falciformis (EAL)	Silky shark	15.0	0.2	29.4	0.2	22.6	0.7	100.5	22	9.6	0.2	10.1	0.2%	0.8	<0.0	0.2	0.2	6.4	0.1	0.1	<0.0
Carcharbinus galapagapsis (CCG)	Galapagos shark	13,0	0,2	0.1	<0.0	33,0	0,7	100,5	2,3	5,0	0,2	10,1	0,376	0,8	<0,0	0,2	0,3	0,4	0,1	0,1	~0,0
Carebarbinus Jourges (CCE)	Bull chark			1.2	<0,0	0.1	<0.0	0.2	<0.0												
Carcharhinus leucus (CCE)	Blacktip chark			7.1	0,0	0,1	<0,0	0,5	<0,0												
Careharhiana lanaimanna (OCC)	Oracity shark	0.1	10.0	7,1	0,1			0,3	<0,0												
Carcharhinus longimanus (OCS)	Duate ale ale	0,1	<0,0	8,1	0,1			0,2	<0,0	0.2	-0.0										
Calcananda anniar (TIC)	Dusty shark			0.7	-0.0			0,3	<0,0	0,2	<0,0										
Galeocerdo cuvier (TIG)	Tiger shark			0,7	<0,0			1,0	<0,0	0,1	<0,0										
Nasolamia velox (CNX)	whitehose shark							0,11	<0,0												
Negaprion brevirostris (NGB)	Lemon shark	120.1	2.0	201.0	2.4	210.4	4.5	0,1	<0,0	200.2	25	140.41	4 70/	0.00	0.2%	102.2	5.2	252.0		10.4	2.2
Prioridce glauca (BSH)	Blue shark	130,1	2,0	301,8	Z,4	219,4	4,5	461,0	10,4	208,2	3,5	149,41	4,7%	9,68	0,3%	163,3	5,3	353,0	5,8	19,4	2,2
Lamnidae	0 10 10		0.0	24.7	0.0	0.5		10.0	0.0	0.0	0.0	45.70	0.5%	2.05	0.4%		0.5	47.4		47	
Isurus oxyrinchus (SMA)	Shortfin mako shark	11,7	0,2	21,7	0,2	9,5	0,2	10,9	0,2	9,2	0,2	15,72	0,5%	2,05	0,1%	14,9	0,5	17,1	0,3	1,7	0,2
Isurus paucus (LMA)	Longtin mako shark			1,5	<0,0			0,1	<0,0												
Odontaspididae		r		1							-				1			1			
Odontaspis noronnai (ODH)	Bigeye sand tiger							0,1	<0,0												L
Spnyrnidae	.																				
Sphyrna lewini (SPL)	Scalloped hammerhead shark	0,9	<0,0	4,5	<0,0	1,3	<0,0	0,6	<0,0												
Sphyrna mokarran (SPK)	Great nammernead			1,5	<0,0																
Spriyma tiburo (SPJ)	Bonnethead	44.7	0.0	0,1	<0,0	47		2.5			0.0										
Spriyrna zygaena (SPZ)	Ismooth nammernead shark	11,/	0,2	4,2	<0,0	1,/	<0,0	3,5	0,1	0,8	<0,0				I	I	I	1			
	- · ·	r						1	r		-				1	r		r			
Galeorninus galeus (GAG)	lope snark			1,1	<0,0						L				L		L				L
Aetobatidae	D 10	-						1		0.00								1			
Aetobatus laticeps (AQX)	Pacific eagle ray							I		0,02	<0,0							I			
Dasyatidae	c::	-								0.00								1			
nypanus longus (KHL)	sungray	C 070 -		43.007.0		4.000 -				0,03	<0,0	2 4				2.077.0	l	6.070.0	L	005 5	
	TOTAL	6.879,7		12.837,6		4.833,4		4.415,0		5.993,2		3.170,8		3.315,9		3.075,6		6.079,0		895,5	

d) Observers' data (data from MPCEIP, 2022c)

MPCEIP (2022c)³ presents information on the composition of catches by species of the longline fleet when using the thin longline based on information collected by the Fisheries Observer Program run by the Fisheries Control Directorate (DCP) of the Undersecretariat of Fisheries Resources (SRP). According the data provided in the document, the information presented corresponds to 114 fishing trips of mother-ship based fishing operations using doradero (LL-DOL) between 2017 and 2021 (2017 [53 trips]; 2018 [20]; 2019 [13]; 2020 [6]; 2021 [22]). However, the SRP sent to the client a different information in relation to the number of observed fishing trips, together with information on the total number of fishing trips per year (see **table 7.3.1.4**). According to the information presented in table 7.3.1.4 the annual observer coverage ranged between 5 and 6% in 2020 and 2021 respectively, and 13-14% in 2017 and 2018 respectively. The decreased coverage in 2020 and 2021 was due to the pandemic caused by the Covid-19.

Table 7.3.1.4. Observed and total fishing trips performed by the Ecuadorian longline mothership vessels targeting dolphinfish (using LL-DOL). Table prepared by the team using data provided by the SRP under the request of the client.



year	observed trips	total trips	% ob.coverage
2017	17	127	13,4%
2018	23	162	14,2%
2019	13	216	6,0%
2020	7	150	4,7%
2021	23	282	8,2%
total	83	937	8,9%

The catch composition based on the observers' data is presented (in number of individuals) in **table 7.3.1.5**. Dolphinfish (*Coryphaena hippurus*) accounts between 96 and 99% of the total individuals caught, depending on the year. Sharks and rays account between 1 and 4% of the individuals caught. Blue shark (*Prionace glauca*) is the only species accounting for \geq 1% of the total individuals caught. Regular interactions with marine turtles are being recorded by the observers, although the number of interactions is low, with an average ratio of interactions of of 0,13 for every 1000 individuals of dolphinfish caught between 2017 and 2021 (min: 0,08 in 2018, 2020 & 2021; max: 0,20 in 2017). MPCEIP (2022c) does not provide the number of interactions by observed number of hooks fished.

Agreement 407 passed on October 12 of 2011 set a minimum observer coverage of 10% of the fishing trips performed by mothership vessels. This regulation has been updated in September 2021 through Agreement MPCEIP-SRP-2021-0208-A. This recent regulation establishes increasingly higher requirements in relation to observer coverage for the longline fleet. According to this regulation, the minimum coverage of 10% applied until December 2022, while in 2023 the minimum coverage shall be increased up to 15%, and increased again up to 20% in 2024. No information on the coverage is provided in MPCEIP (2022c), but based on the data provided by the SRP the team calculated that the average observer coverage when using LL-DOL between 2017 and 2021 was around 9% (table 7.3.1.4). However, MPCEIP (2022d) states that the observer coverage in 2021 for the longline fleet was 6,4%. This report also indicates that most of the observer effort is focused on the LL-TBS, while only 25% goes to the LL-DOL. Besides, the observers are placed on board the mothership vessels, so their observations are restricted to the fishing operations performed on board the mothership, while the operations on the associated fiberglass skiffs are not being observed. The limited observer coverage is reflected in the fact that the number of different fish and shark species recorded by the observers (13 species of Ostheichthyes and 23 species of Chondrychthyes). See section 7.3.1.4 for more details on the implications of the limited observer coverage in the classification of ETP species as Data Deficient species (DD).

Although data before 2017 is not shown in **table 7.3.1.5**, the team had the chance to review observers' records down to 2008. When considering data from previous years, no significant differences were found in the catch species composition, however, the list of protected species interacting with the UoA enlarges with the following marines turtles and shark species: leatherback turtle (*Dermochelys coriacea*), hawksbill turtle (*Eretmochelys imbricata*), Scalloped hammerhead shark (*Sphyrna lewini*), great hammerhead shark (*S.moakarran*), bonnethead shark (*S.tiburo*), smooth hammerhead shark (*S.zygaena*), Ocean whitetip shark (*Carcharhinus longlimanus*). To be precautious, all these species were included the assessment as ETPs (see **table 7.3.1.6**).

Table 7.3.1.5 Number of individuals of each species recorded by observers aboard mother-ship vessels fishing with doradero (LL-DOL) between 2017-2021. Source: MPCEIP (2022c).



	20	17	20	18	20	19	20	20	20	21
Especie	#	%	#	%	#	%	#	%	#	%
Osteichthyes	60069	99,03	73257	98,78	69717	98,43	25210	95,92	62575	96,51
Coryphaenidae										
Coryphaena hippurus	59966	98,86	73125	98,60	69664	98,35	25154	95,70	62417	96,26
Coryphaena equiselis	0	0,00	1	0,00	13	0,02	10	0,04	21	0,03
Scombridae										
Acanthocybium solandri	8	0,01	3	0,00	0	0,00	0	0,00	8	0,01
Thunnus albacares	4	0,01	4	0,01	0	0,00	1	0,00	9	0,01
Thunnus obesus	2	0,00	0	0,00	0	0,00	1	0,00	1	0,00
Katsuwonus pelamis	7	0,01	11	0,01	2	0,00	11	0,04	10	0,02
Istiophoridae										
Istiompax indica	0	0,00	1	0,00	0	0,00	1	0,00	0	0,00
Istiophorus platypterus	0	0,00	1	0,00	1	0,00	0	0,00	0	0,00
Tetrapturus angustirostris	0	0,00	0	0,00	1	0,00	0	0,00	0	0,00
Kajikia audax	14	0,02	35	0,05	21	0,03	1	0,00	39	0,06
Makaira nigricans	1	0,00	2	0,00	0	0,00	0	0,00	0	0,00
Xiphiidae										
Xiphias gladius	65	0,11	65	0,09	15	0,02	31	0,12	69	0,11
Gempylidae										
Lepidocybium flavobrunneum	2	0,00	9	0,01	0	0,00	0	0,00	1	0,00
Chondrychthyes	570	0,94	889	1,20	1090	1,54	1056	4,02	2246	3,46
Alopiidae										
Alopias pelagicus	133	0,22	188	0,25	53	0,07	17	0,06	169	0,26
Alopias superciliosus	1	0,00	2	0,00	0	0,00	0	0,00	3	0,00
Carcharhinidae										
Carcharhinus falciformis	16	0,03	49	0,07	10	0,01	1	0,00	29	0,04
Prionace glauca	410	0,68	630	0,85	927	1,31	819	3,12	1906	2,94
Lamnidae										
Isurus oxyrinchus	9	0,01	20	0,03	57	0,08	79	0,30	95	0,15
Pseudocarchariidae										
Pseudocarcharias kamoharai	0	0,00	0	0,00	0	0,00	0	0,00	1	0,00
Dasyatidae										
Pteroplatytrygon violacea	0	0,00	0	0,00	43	0,06	140	0,53	42	0,06
Mobulidae										
<i>Mobula</i> sp.	1	0,00	0	0,00	0	0,00	0	0,00	1	0,00
Testudines	12	0,02	6	0,01	12	0,02	2	0,01	5	0,01
Cheloniidae										
Chelonia mydas	6	0,01	2	0,00	9	0,01	2	0,01	4	0,01
Caretta caretta	0	0,00	0	0,00	1	0,00	0	0,00	0	0,00
Lepidochelys olivacea	6	0,01	4	0,01	2	0,00	0	0,00	1	0,00
No Identificado	8	0,01	11	0,01	11	0,02	15	0,06	13	0,02

e) Bait species (qualitative data collected from Martinez-Ortiz and Zuñiga-Flores (2012), and other sources)

The bait to be used by the fibers and nurses is captured by using jigs, hand lines. According to Martinez-Ortiz and Zuñiga-Flores (2012) the types of bait or bait used are flying jumbo squid (*Dosidicus gigas*); the frigate tuna (*Auxis thazard thazard*) and the bigeye scad (*Selar crumenophthalmus*). Only the bigeye scad is used alive, the other two species of bait are cut into pieces before being placed on the hooks Martinez-Ortiz and Zuñiga-Flores (2012). This document acknowledges that flying jumbo squid is the species most used for bait.

Besides, the team had the chance to see data collected by observers on board where qualitative information on the bait used in each line (% of hooks baited with each species) showed that the following species were used: flying jumbo squid, pacific thread herring (*Opisthonema spp*), and frigate tuna (*Auxis spp*.). This data also revealed that the flying jumbo squid is the species most used for bait.

Finally, the client performed a survey among 51 vessel owners to determine which bait species they are using. The result of the survey did not allow at this stage to obtain an estimate of volume per species, but it showed that the species used were flying jumbo squid, frigate tuna, pacific thread herring, and chub mackerel (*Scomber japonicus*).



II. P2 species classified following MSC requirements.

Apart from the target species, a total of 40 different species and taxa of bony fish (14 spp), sharks and rays (26 spp) were caught by the UoA between 2013 and 2021. The observers' recorded that fishery also interacts with 5 different species of marine turtles. Besides, 5 species are being used as bait in this fishery (1 cephalopod, 4 bony fish).

Thus, a total of 50 P2-species were considered for this assessment in relation to UoA1. **Table 7.3.1.1.6** lists all the P2-species considered for UoA1. Each one of the species was assigned to a particular P2-species component (**Primary/Secondary/ETP**) and subcomponent (**Main/Minor**), in accordance with MSC requirements.

In the absence of quantitative data on the volumes per species used, the team decided to consider assess the flying jumbo squid as a main species, and all the other bait species as minor. However, quantitative data on the volume are essential to complete the assessment of the bait species in accordance with the MSC requirements and the team has warned the client about this.

Table 7.3.1.6. List of all species susceptible to interact with the UoA based on the sources listed in Section 7.3.1.1(I). Species classified in accordance with SA3.1.3-3.1.5, SA3.4.2.1-3.4.2.5 and SA3.4.4.-3.4.5. Data deficient column was assessed using criteria in Table 3 of FCP7.7.3. Note: Main Primary species are highlighted in dark green; Minor Primary in light green; Main Secondary in dark grey; Minor Secondary in light grey; and ETPs in orange.



Scientific name	Common name (EN) & ASFIS code	Common name (ES)	P2 Component	P2 Subcomp	ETP Reg	Sources of info	Data deficient
OSTEICHTHYES							
Coryphaenidae							
Coryphaena hippurus	Dolphinfish	Dorado	N/A(P1)				
Coryphaena equiselis (CFW)	Pompano Dolphinfish	Dorado chato	Secondary	Minor	N/A	(d)	Yes
Scombridae							
Acanthocybium solandri (WAH)	Wahoo x	Wahoo	Secondary	Minor	N/A	(b)(c)(d)	Yes
Thunnus albacares	Yellowfin tuna (YFT)	Albacora	Primary	Minor	N/A	(b)(c)(d)	No
Thunnus obesus	Bigeye tuna (BET)	Patudo	Primary	Minor	N/A	(c)(d)	No
Katsuwonus pelamis (SKJ)	Skipjack tuna	Bonito	Primary	Minor	N/A	(c)(d)	No
Euthynnus lineatus (BKJ)	Black skipjack	Bonito Pata seca	Secondary	Minor	N/A	(a)	Yes
Sarda orientalis (BIP)	Striped bonito	Bonito Sierra	Secondary	Minor	N/A	(c)	Yes
Istiophoridae							
Istiompax indica (BLM)	Black marlin	Picudo negro o plomo	Secondary	Minor	N/A	(c)(d)	Yes
Istiophorus platypterus (SFA)	Indo-Pacific sailfish	Banderon	Secondary	Minor	N/A	(b)(c)(d)	Yes
Tetrapturus angustirostris (SSP)	Shortbill spearfish	Picudo Pico Corto	Secondary	Minor	N/A	(c)(d)	Yes
Kajikia audax (MILS)	Striped marlin	Gacho	Secondary	Minor	N/A	(b)(c)(d)	No
Makaira nigricans (BUM)	Blue marlin	Picudo	Secondary	MAIN	N/A	(b)(c)(d)	No
Xiphiidae							
Xiphias gladius (SWO)	Swordfish	Espada	Secondary	MAIN	N/A	(b)(c)(d)	No
Gempylidae							
Lepidocybium flavobrunneum (LEC)	Escolar	Miramelindo	Secondary	Minor	N/A	(c)(d)	Yes
CHONDRICHTHYES							
Alopiidae							
Alopias pelagicus (PTH)	Pelagic thresher shark	Rabon bueno	Secondary	MAIN	N/A	(b)(c)(d)	No
Alopias superciliosus (BTH)	Bigeye thresher	Rabon amargo	Secondary	Minor	N/A	(b)(c)(d)	No
Alopias vulpinus (ALV)	Thresher	Rabon tramado	Secondary	Minor	N/A	(c)	No
Carcharhinus falciformis (FAL)	Silky shark	Mico	ETP	N/A	Agreement MPCEIP-SRP 2020-0084- A; IATTC res C-21-06	(b)(c)(d)	No
Carcharhinus galapagensis (CCG)	Galapagos shark	Galapagos	Secondary	Minor	N/A	(c)	No
Carcharhinus leuca (CCE)s	Bull shark	Come perro	Secondary	Minor	N/A	(c)	No
Carcharhinus limbatus (CCL)	Blacktip shark	Punta negra	Secondary	Minor	N/A	(b)(c)(d)	No
Carcharhinus Iongimanus (OCS)	Oceanic whitetip shark	Aleton	ETP		Agreement MPCEIP-SRP 2019-0019- A; IATTC res C-11-10	(c)	Yes



Scientific name	Common name (EN) & ASFIS code	Common name (ES)	P2 Component	P2 Subcomp	ETP Reg	Sources of info	Data deficient
Carcharhinus obscurus (DUS)	Dusky shark	Baboso	Secondary	Minor	N/A	(c)	No
Galeocerdo cuvier (TIG)	Tiger shark	Tigre	Secondary	Minor	N/A	(c)	No
Nasolamia velox (CNX)	Whitenose shark	Lechoso	Secondary	Minor	N/A	(c)	No
Negaprion brevirostris (NGB)	Lemon shark	Limón	Secondary	Minor	N/A	(c)	No
Prionace glauca (BSH)	Blue shark	Azul	Secondary	MAIN	N/A	(b)(c)(d)	No
Lamnidae							
Isurus oxyrinchus (SMA)	Shortfin mako	Tinto	Secondary	Minor	N/A	(b)(c)(d)	No
Isurus paucus (LMA)	Longfin mako	Tinto tramado	Secondary	Minor	N/A	(C)	No
Odontaspididae							
Odontaspis noronhai (ODH)	Bigeye sand tiger	Solrayo	Secondary	Minor	N/A	(c)	No
Pseudocarchariidae							
Pseudocarcharias kamoharai (PSK)	Crocodile shark	Tiburón cocodrilo	Secondary	Minor	N/A	(d)	No
Sphyrnidae							
Sphyrna lewini (SPL)	Scalloped hammerhead	Cachuda roja	ETP	N/A	Agreement MPCEIP-SRP 2020-0084-A	(c)	Yes
Sphyrna mokarran (SPK)	Great hammerhead	Cachuda Gigante	ETP	N/A	Agreement MPCEIP-SRP 2020-0084-A	(c)	Yes
Sphyrna tiburo (SPJ)	Bonnethead	Cachuda cabeza de pala	ETP	N/A	Agreement MPCEIP-SRP 2020-0084-A	(c)	Yes
Sphyrna zygaena (SPZ)	Smooth hammerhead	Cachuda Blanca	ETP	N/A	Agreement MPCEIP-SRP 2020-0084-A	(c)	Yes
Triakidae							
Galeorhinus galeus (GAG)	Tope shark	Cazón	Secondary	Minor	N/A	(c)	No
Aetobatidae							
Aetobatus laticeps (AQX)	Spotted eagle ray	Raya pintada	ETP		Agreement MPCEIP-SRP 2019-0019-A	(c)	Yes
Dasyatidae		-					
Hypanus longus (KHL)	Longtail stingray	Raya	Secondary	Minor	N/A	(C)	Yes
violacea (PLS)	Pelagic Stingray	Raya latigo / Pastinaca	Secondary	Minor	N/A	(d)	Yes
Mobulidae							
Mobula spp. (RMV)	Rays unid.	Rayas sin ident.	ETP	N/A	Agreement MPCEIP-SRP 2022-0078- A; IATTC Res C-15-04	(d)	Yes
Turtles							
Caretta caretta (TTL)	Loggerhead Turtle	Tortuga caguama	ETP	N/A	IUCN VU, CITES App I	(d)	Yes
Chelonia mydas (TUG)	Green Turtle	Tortuga verde	ETP	N/A	IUCN EN, CITES App I	(d)	Yes
Dermochelys coriacea (DKK)	Leatherback turtle	Tortuga verde	ETP	N/A	IUCN VU, CITES App I	(d)	Yes



Scientific name	Common name (EN) & ASFIS code	Common name (ES)	P2 Component	P2 Subcomp	ETP Reg	Sources of info	Data deficient
Eretmochelys imbricata (TTH)	Hawksbill turtle	Tortuga carey	ETP	N/A	IUCN CR, CITES App I	(d)	Yes
Lepidochelys olivacea (LKV)	Olive Ridley	Tortuga golfina	ETP	N/A	IUCN VU, CITES App I	(d)	Yes
BAIT SPECIES							
Cepaholopods							
Dosidicus gigas (GIS)	Flying jumbo squid / Humbolt squid	Calamar de Humbolt/gigante	Secondary	MAIN	N/A	(e)	No
Clupeidae							
Opisthonema spp. (THX)	Pacific thread herring	Machuelos	Secondary	Minor	N/A	(e)	Yes
Carangidae							
Selar crumenophthalmus (BIS)	Bigeye scad	Caballa ojona	Secondary		N/A	(e)	Yes
Scombridae							
Auxis spp. (FRZ)	Frigate tuna nei Botella		Secondary	Minor	N/A	(e)	Yes
Scomber japonicus	Chub mackerel	Morenillo	Secondary	Minor	N/A	(e)	Yes

7.3.1.2 Primary Species

The difference between 'Primary' and 'Secondary' species lies on whether management is based on biological reference points (primary) or not (secondary). On the other hand, the difference between 'Main' and 'Minor' lies on the proportion (in weight) that a particular species represents in the catch. According to SA3.4.2, the designated weight threshold to differentiate between 'Main' and 'Minor' is 5% (or 2% in the case of less resilient species, such as sharks and rays): species accounting \geq 5% in weight of the total catch are considered as 'Main', while species falling below that threshold are classified as 'Minor' (unless the total catch of the UoA is exceptionally large, such that even small proportions of a P2 species significantly impact the affected stock, SA3.4.4).

Only 3 tuna stocks out of the 50 listed in **Table 7.3.1.6** are managed based on biological reference points and therefore assessed as primary P2-components: EPO bigeye (*Thunnus obesus*), EPO yellowfin tuna (*T.albacares*), and EPO skipjack tuna (*Katsuwonus pelamis*). The management of all these stocks is based on the IATTC resolutions, which in turn are based on stock assessments performed by the ISC.

As shown in **tables 7.3.1.2 and 7.3.1.3**, the relative contribution of each of these 3 tuna species to the total volume landed by the UoA per year is less than 0,5%, although the yellowfin tuna reached a maximum annual contribution of 3,8% in 2016, while bigeye tuna accounted for 2,0% in 2017. The species catch composition observed on board shown in **table 7.3.1.5** (in number of individuals, instead of weight) supports landing data and confirms that relative contribution of tropical tunas to the total catches is very low. Therefore, **these 3 tuna species were assessed as 'minor' subcomponents.**

Table 7.3.1.7 summarises the results of the latest stock assessments performed for the 3 primary stocks assessed, while **Table 7.3.1.8** summarises the key management regulations and measures adopted for these stocks. All the necessary information to assess the impact of the UoA on all primary subcomponents is presented under **section 7.3.2** in the following scoring tables: PI 2.1.1 (outcome), PI 2.1.2 (management), PI 2.1.3 (Information).

Table 7.3.1.7. Summary of the latest asses	essments available for the 3 stocks assessed as primary P2-components. Sou	urce:
Elaborated by the tean	am based on information extracted from the IATTC website.	

Stock	Assessment report	Limit reference points	Target Reference Points	Stock status
EPO BET	<u>Xu et al</u> (2020) ⁴	Res. C-16-02:	Res. C-16-02:	Prob (S _{current} <s<sub>MSY) = 53% Prob (S_{current}<s<sub>0,5R0) = 6%</s<sub></s<sub>

⁴ Xu, H., Maunder, M.N., Minte-Vera, C., Valero, J.L., Lennert-Cody, C., and Aires-da-Silva, A. 2020. Bigeye tuna in the Eastern Pacific Ocean, 2019: Benchmark assessment. Document SAC-11-06 REV. 11th SAC Meeting. 11-15 May 20201. La Jolla, California



		S _{0,5R0} (equivalent to 0077 S ₀)	$S_{current}/S_{MSY} = 1$	$Prob (F_{auroot} > F_{0.5P0}) = 5\%$
	Minte-Vera et	F0,5R0	F _{current} /F _{MSY} =1	$\frac{1100 (F current > 10,5R0) = 370}{Prob (S_{current} < S_{MSY}) = 12\%}$ $Prob (S_{current} < S_{0,5R0}) = 0\%$
	al. (2020) ⁵			Prob (F _{current} >F _{MSY}) = 9% Prob (F _{current} >F _{0,5R0}) = 0%
EPO SKJ	Maunder et al.		Conservative proxies^:	S _{MSY} /S ₀ >1 Prob (S _{current} <s<sub>0,5R0) = 0%</s<sub>
	<u>(2022)</u> •		$S_{MSY}/S_0=0,30.$ $F_{target}=F_{0.3}$	Fcurrent < Ftarget

^ Maunder et al (2022): A conservative proxy for the target biomass of SBR=0,3, and the fishing mortality corresponding to that biomass are used as target reference points

Table 7.3.1.8. Key management regulations and measures adopted by the IATTC for the 3 stocks assessed as primary P2components. Source: Elaborated by the team based on information extracted from the IATTC website.

Stock	Key IATTC Resolutions	TAC/Catch limit	HCR
EPO BET	<u>Res. C-03-01; Res. C-16-02; C-21-04; C-22-</u>	C-21-04: Catch limits for LL-fleets from	Yes (C-16-02)
	<u>05</u>	China, Japan, Korea, Taiwan EEEUU. All	
		other CPCs 550t/year or limit their catches	
		to the 2001 levels	
EPO YFT	Res. C-16-02; C-21-04; C-22-05	No	Yes (C-16-02)
EPO SKJ	Res. C-16-02; C-21-04; C-22-05	No	Yes (C-16-02)

7.3.1.3 Secondary Species

Apart from the 3 species/stocks assigned as primary components of the P2, all the other species listed in **Table 7.3.1.6** which are not considered as ETP species (see next section) were classified as 'secondary' components. The resulting list includes a total of 35 species, including 11 bony fish species, 13 sharks and rays, and 1 cephalopod.

According to all the different sources of information consulted (see **section 7.3.1.1**), only 4 species/stocks are above the threshold to be considered 'main' secondary components: Pacific blue marlin, South EPO swordfish, blue shark, and the pelagic thresher shark. The remaining 32 secondary species were classified as 'minor' components for the purpose of this assessment.

There are not management tools or measures in place intended to achieve stock management objectives reflected in either limit or target reference points, neither at a national level (in Ecuador or Peru) nor at international level (IATTC or SPRFMO in the case of the flying jumbo squid), for any of these species/stocks; and this is the reason why they are all classified as 'secondary' components. For 20 out of these 35 secondary components, there are biologically based limits available, derived either from analytical stock assessments (e.g. EPO Striped marlin, Pacific blue marlin, South EPO swordfish, Pacific Jumbo squid) or using empirical approaches such as ecological risk assessments (e.g. all shark listed in **table 7.3.1.6** -but not ray species-). These species/stocks are assessed using the Standard Assessment Tree (Annex SA, FCP). However, for the remaining 15 components there are no reference points available, so they are considered as Data Deficient (DD) (FCP7.7.3). According to FCR7.7.6, RBF shall be triggered for assessing status (PI 2.2.1) of DD species. However, PF4.1.4 allows the team to avoid conducting RBF on 'minor' species when evaluating PI 2.2.1, as far as the overall PI score is cap to 80 (PF5.3.2).

⁽USA). https://www.iattc.org/GetAttachment/1eb798ce-29b8-49c9-8473-14d68638afb5/SAC-11-06_Bigeye-tuna-benchmark-assessment-2019.pdf

⁵ Minte-Vera, C., Maunder, M.N., Xu, H., Valero, J.L., Lennert-Cody, C.E., Aires-da-Silva., A. 2020. Yellowfin tuna in the Eastern Pacific Ocean, 2019: Benchmark assessment. Document SAC-11-07 REV. 11th SAC Meeting. 11-15 May 20201. La Jolla, California (USA). https://www.iattc.org/GetAttachment/1996b7a3-25aa-443d-9bcc-eee859137394/SAC-11-07_Yellowfin-tuna-benchmark-assessment-2019.pdf

⁶ Maunder, M.N., Xu, H., Minte-Vera, C., Valero, J.L., Lennert-Cody, C.E., Aires-da-Silva, A. 2021. Skipjack tuna in the EPO. Provisional Assessment. Document SAC-13-07. 13th SAC Meeting. La Jolla, California (EE. UU.) 16-20 May 2022. IATTC. https://www.iattc.org/GetAttachment/0acfc999-fbcd-4b07-9e8d-fc5f85fd88e8/SAC-13-07_Skipjack-tuna-interim-assessment-2022.pdf

The necessary information to assess the impact of the UoA on all secondary subcomponents is presented under **section 7.3.2** in the following scoring tables: PI 2.2.1 (outcome), PI 2.2.2 (management), PI 2.2.3 (Information).

7.3.1.4 ETP Species

According to MSC requirements (SA 3.1.5), the team shall assign ETP species as follows:

- a. Species that are recognized by national ETP legislation.
- b. Species listed in binding international agreements given below:
 - Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.
 - Binding agreements concluded under the Convention on Migratory Species (CMS).
- c. Species classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CR).

The 5 species of marine turtles listed in **Table 7.3.1.6**, since they are all listed in the Appendix I of CITES. Also, these marine turtles are also listed as Vulnerable (loggerhead turtle, leatherback and olive ridley turtle), Endangered (green turtle) or Critical Endangered (Hawksbill turtle) in the IUCN Redlist. At a National level the Ministerial Agreement 212 passed in 1990 set that all marine turtles are protected species by the State of Ecuador, so targeting, processing and trading marine turtles is prohibited. Based on the above, all species of marine turtles listed in the table are considered ETPs.

None of the Osteichthyes or Chondrichthyes listed in **table 7.3.1.6** are listed in the Appendix I of CITES (some of the shark species are listed in Appendix II, but none in Appendix I) or in any binding agreement concluded under the CMS. Ecuador signed the Memorandum of Understanding on the Conservation of Migratory Sharks in 2017 (concluded under the CMS) and the Oceanic whitetip shark is included in the Appendix I of the MoU, but this is a legally non-binding tool. However, the need to protect some shark species has been recognized by the state of Ecuador, in accordance with the conservation measures adopted by the IAATC in relation to sharks (**table 7.3.1.6** list all ETP shark species impacted by the UoA and the applicable regulations). Based on the above, the team determined the ETP shark species impacted by the UoA are: silky shark (*C.falciformis*), Oceanic white tip shark (*C.longimanus*), 4 hammerhead shark species (*S.lewini, S.mokarran, S.tiburo, S.Zygaena*), spooted eagle ray (*Atobatus laticeps*) and all mobula species (*Mobula spp.*).

Table 7.3.1.6 lists all species for which interactions with the Ecuadorian longline fleet targeting dolphinfish have been recorded (landings and observer records). However, there are also protected marine mammals and birds in the area where the fleet operates. Ecuador protected all whales within its EEZ through the Ministerial Agreement 196 passed in June 1990, and more recently extended this protection to all marine mammals through the Ministerial Agreement MPCEIP-SRP-2021-0238-A. Ecuador is also a signatory Party of the legally binding Agreement on the Conservation of Albatrosses and Petrels (ACAP) concluded under the CMS. No interactions with marine mammals or seabirds have been reported by the observers on board the Ecuadorian longline fleet targeting dolphinfish.

I. Turtles

a) Impact of the UoA

The fishing season for dolphinfish matches with turtle nesting season in mainland Ecuador. Regular interactions with marine turtles are being recorded by the observers (MPCEIP, 2022c), although the number of interactions is low, with an average ratio of interactions of 0,13 for every 1000 individuals of dolphinfish caught between 2017 and 2021 (min: 0,08 in 2018, 2020 & 2021; max: 0,20 in 2017). MPCEIP (2022c) does not provide the number of interactions per observed number of hooks fished. The green turtle (*Chelonia mydas*) accounts for 62% of the interactions, followed by the loggerhead turtle (*Caretta caretta*) (35%) and the olive ridley turtle (*Lepidochelys olivacea*) (3%). No data on the fate (released dead, alive or alive with injuries) of the turtles that interacted during this period has been provided to the team, although observers are thought to record these details.

However, observers' data from previous years (2008-2016) show a different pattern in the interactions per species, with the olive ridley turtle being the species accounting for most of the interactions (67%), followed by the green turtle (31%), followed by the leatherback turtle (Dermochelys coriacea) (1%), the loggerhead turtle (0.6%), and the hawksbill turtle (Eretmochelys imbricata) (0,3%) (Esparza-Ramirez et al 2018, in Resolution N^oMAAE-SPN-2021-001). 64% of these turtles were released alive, 18% were released alive but with minor injuries, while also 18% were released dead or alive but with serious injuries.



Given the inconsistency of the data in relation to the species composition of the interactions, the team downloaded from the IATTC website the annual summary reporting submitted by Ecuador to the IAATC to comply with c-19-08, based on the data collected by the scientific observers on board the tuna longline vessels MPCEIP (2022e). The information showed in this report differs from data reported in MPCEIP (2022c) and shown in table 7.3.1.4. MPCEIP (2022e) shows that the observed interactions in 2021 were: 14 Olive Ridley turtles, 7 green turtles and 2 Hawksbill turtles. Those differences cannot be attribute to the fact that data presented in MPCEIP (2022e) include both types of longline gear (LL-TBS and LL-DOL).

Current regulations oblige to comply with a minimum observer coverage of 10% of the fishing trips performed by the mothership vessels, and to increase it progressively up to 20% in 2024. No information on the coverage is provided in MPCEIP (2022c), but based on the data provided by the SRP the team calculated that the average observer coverage when using LL-DOL between 2017 and 2021 was around 9% (**table 7.3.1.4**). However, MPCEIP (2022d) indicates that the observer coverage in 2021 was only 6,7%, and only 25% of that effort was focused on the LL-DOL (the effort was placed in observing the LL-TBS operations). Besides, the observers are placed on board the mothership vessels, so their observations are restricted to the fishing operations performed on board the mothership, while the operations on the associated fiberglass skiffs are not being observed. MPCEIP (2022e) indicates that approximately only 1% of the total hooks are being observed. However, that estimate refers to both types of longlines (LL-TBS and LL-DOL). This implies that, even that the observed hooks for LL-DOL remains unknows, it is definitely well below 1% of the total hooks used.

The team decided that despite on counting with observers' data, the impact of the assessed fishery on marine turtles cannot be analytically determined because:

- i. Estimated average observer coverage for the LL-DOL between 2017 and 2021 was 9%, although there are some discrepancies between data sources. In any case, none of the fishing operations performed on board the fiberglass skiff is being observed (and the number of registered fiberglass skiffs (2.844 in 2022 according to MPCEIP 2022b) is more than 10 times higher than the number of mothership vessels (244).
- ii. The number of interactions per observed number of hooks fished is not provided neither by MPCEPI (2022c) nor in Esparza-Ramirez et al 2018 as quoted in Resolution N^oMAAE-SPN-2021-001. But based on data presented in MPCEIP (2022e) it can be estimated that less than 1% of the total hooks used are being observed (probably no more than 0,3%).
- iii. The fate of the interacted individuals (alive/dead) is not reported for the most recent data, although observers are thought to record this data.
- iv. There is a remark inconsistency in the observers data (eg. interactions reported by the MPCEIP in 2021 are totally different depending on the source used, species composition different dramatically for the two studied periods (2008-16 and 2017-2021)).

Thus, all marine turtles are considered as Data Deficient species (DD) and RBF shall be triggered for its assessment.

b) Conservation and management measures

At a National level the Ministerial Agreement 212 passed in 1990 set that all marine turtles are protected species by the State of Ecuador, so targeting, processing, and trading marine turtles was prohibited since them. In addition, in 2014 the National Plan for the Conservation of Sea Turtles (PNCTM) was made official through Ministerial Agreement No. 324, published in the Official Gazette No. 371 of November 10, 2014. The PNCTM was in force until 2019, and its objective was to identify the necessary actions to ensure the conservation of sea turtles and their critical habitats in Ecuador. In 2021, Resolution MAAE-SPN-2021-001 approved and officialised the Action Plan for the Conservation of Sea Turtles in Ecuador 2021-2030, which will be the technical tool to implement efforts and initiatives for the conservation of these species.

In addition, Ecuador is a signatory party of the Inter-American Convention for the Protection and Conservation of Sea Turtles (CIT). Several Resolutions for the conservation of the marine turtles in the Eastern Pacific Ocean have been adopted within the CIT framework.

Recent IATT Resolution C-19-04 adopted several measures applicable to CPCs with longline vessels fishing in the Convention Area:



- a) Require owners/operators of longline vessels to carry on board, and employ when appropriate, safe-handling tools for the safe release of sea turtles (e.g. de-hookers, line cutters, and dip nets).
- b) Require that owners/operators/vessel crew of longline vessels take all reasonable steps, as appropriate, to ensure the safe release of any incidentally caught sea turtles by following handling and release guidelines in the Appendix, and consistent with the FAO "Best practices for sea turtle handling and release."
- c) Record all observed interactions involving sea turtles during longline fishing operations and report such information in accordance with the parameters set in paragraph 4.a.ii.
- d) Require owners/operators of longline vessels fishing in a shallow-set manner⁷ to employ at least one of the following mitigation measures:
 - i. Use only large circle hooks⁸,
 - ii. Use only finfish for bait, or
 - iii. Another mitigation measure to reduce sea turtle bycatch that has been approved by the Commission. A proposal for such a measure shall be submitted to the Bycatch Working Group at its meeting in the year prior to desired implementation, for review and potential recommendation to the Scientific Advisory Committee (SAC) and approval of the Commission.

Besides, CPCs shall:

- a) Require owners/operators/vessel crew on vessels targeting species covered by the Convention to promptly release, in a manner that causes the least harm to the extent practicable, all sea turtles, without compromising the safety of any persons.
- b) Ensure that vessel operators and/or at least one crew member on board of vessels targeting species covered by the Convention in fisheries that have reported sea turtle interactions, and particularly those without observers, are trained in techniques for handling and release of sea turtles to improve survival after release.
- c) Strive to implement or enhance observer programs, including with electronic monitoring once standards are adopted by the Commission, for fisheries under the purview of the Commission that may have sea turtle bycatch, taking into consideration economic and practical feasibility.
- d) Continue to participate in and promote research to identify techniques to further reduce sea turtle bycatch in all gear types used in the EPO.
- e) Investigate the use of temporary fishing closures adjacent to nesting beaches or known foraging hotspots to reduce fishing interactions with sea turtles.

Also, safe handling and release guidelines for sea turtles are includes as Appendix. The guideline for the longline vessels is as follows:

- a) When practicable, and when operator or crew on board are trained, comatose sea turtles should be brought on board immediately.
- b) If a sea turtle is too large or hooked in such a manner as to preclude safe boarding without causing further damage/injury to the turtle, line clippers should be used to clip the line and remove as much line as possible prior to releasing the turtle.
- c) If a sea turtle is observed to be hooked or entangled by longline gear during hauling operations, the vessel operator should immediately cease hauling operations until the turtle has been removed from the longline gear or brought on board the vessel.
- d) If hooked externally or hook is fully visible, hooks should be removed from sea turtles as quickly and carefully as possible. If a hook cannot be removed from a turtle (e.g., ingested or in roof of mouth), the line should be cut as close to the hook as possible.
- e) Live turtles should be returned to the sea after handling:
 - i. By putting the vessel engine in neutral gear so that the propeller is disengaged, and the vessel is stopped, and releasing the turtle away from deployed gear; and
 - ii. Observing that the turtle is safely away from the vessel before engaging the propeller and continuing operations.



⁷ For purposes of this Resolution, shallow-set manner, including surface longlines, means the majority of hooks fish at depths shallower than 100 meters.

⁸ Large circle hooks are defined as a hook with the point turned perpendicularly back to the shank to form a generally circular or oval shape, and the point of the hook not offset more than 10 degrees.

- f) If the sea turtle brought aboard the vessel is comatose or inactive, resuscitation should be attempted as described below:
 - i. When handling a sea turtle, attempts should be made to hold the animal by the shell, avoiding the head and neck region, and flippers.
 - ii. Strive to remove and/or disentangle any foreign items from the sea turtle, such as any plastic items, netting, or embedded hooks, etc.
 - iii. Placing the turtle on its bottom shell (plastron) so that the turtle is right side up and elevating its hindquarters at least 6 inches (15 cm) for a period of 4 up to 24 hours. The amount of the elevation depends on the size of the turtle; greater elevations are needed for larger turtles. Periodically, rock the turtle gently left to right and right to left by holding the outer edge of the shell (carapace) and lifting one side about 3 inches (8 cm) then alternate to the other side. Gently touch the eye and pinch the tail (reflex test) periodically to see if there is a response.
 - iv. Sea turtles being resuscitated should be shaded and kept damp or moist but under no circumstance be placed into a container holding water. A water-soaked towel placed over the head, carapace, and flippers is the most effective method in keeping a turtle moist.
 - v. Sea turtles that revive and become active should be released over the stern of the boat only when fishing gear is not in use, when the engine gears are in neutral position, and in areas where they are unlikely to be recaptured or injured by vessels. f. Sea turtles that fail to respond to the reflex test or fail to move within 4 hours (up to 24, if possible) should be returned to the water in the same manner as that for actively moving turtles.

II. Sharks

a) Impact of the UoA

Regular landings of silky shark (*C.falciformis*) have been reported during the period 2017-2022, with ratios ranging from 0,1 to 2,9 kg of silky shark for every ton of dolphinfish caught. Other than the silky shark, the only shark species protected from landings during this period are the smooth hammerhead shark (S.zygaena) and the Pacific eagle ray (Aetobatus laticeps), both only in 2017 (the ratios were 0,2kg of smooth hammerhead shark for every ton of dolphinfish and 0,003 kg of Pacific eagle ray).

However, data send by the client prior to 2017 shows that the list of (currently) protected sharks landed in this fishery also included: Ocean whitetip shark (C.longimanus, Scalloped hammerhead shark (S.lewini), great hammerhead (S.mokarran) and bonnethead (S.tiburo). All these species were included in the assessment as ETP species.

The only protected species recorded by observers during that same period (2017-2021) are the silky shark and Mobula spp (MPCEIP, 2022c). The average ratio for that period was 0,36 individuals of silky shark for every 1000 individuals of dolphinfish caught, and 0,01 in the case of the Mobula. MPCEIP (2022c) does not provide the number of interactions per observed number of hooks fished. No data on the fate (released dead, alive or alive with injuries) of the sharks that interacted during this period has been provided to the team, although observers are thought to record these details.

The team downloaded from the IATTC website the annual summary reporting submitted by Ecuador to the IAATC to comply with c-19-08, based on the data collected by the scientific observers on board the tuna longline vessels MPCEIP (2022e). The information showed in this report differs from data reported in MPCEIP (2022c) and shown in **table 7.3.1.4**. MPCEIP (2022e) shows that the observed interactions with sharks in 2021 were: 30 pelagic stingrays (P.violacea), 1 crocodile shark (P.karai), 3 blue sharks (P.glauca), 2 Mobulas (Mobula spp.). Those differences cannot be attribute to the fact that data presented in MPCEIP (2022e) include both types of longline gear (LL-TBS and LL-DOL).

Current regulations oblige to comply with a minimum observer coverage of 10% of the fishing trips performed by the mothership vessels, and to increase it progressively up to 20% in 2024. No information on the coverage is provided in MPCEIP (2022c) but based on the data provided by the SRP the team calculated that the average observer coverage when using LL-DOL between 2017 and 2021 was around 9% (**table 7.3.1.4**). However, MPCEIP (2022d) indicates that the observer coverage in 2021 was only 6,7%, and only 25% of that effort was focused on the LL-DOL (the effort was placed in observing the LL-TBS operations). Besides, the observers are placed on board the mothership vessels, so their observations are restricted to the fishing operations performed on board the mothership, while the operations on the associated fiberglass skiffs are not being observed. MPCEIP (2022e) indicates that approximately only 1% of the total hooks are being observed. However, that estimate refers to both types of longlines (LL-TBS and LL-DOL). This



implies that, even that the observed hooks for LL-DOL remains unknows, it is definitely well below 1% of the total hooks used.

The team decided that despite on counting with observers' data, the impact of the assessed fishery on protected cannot be analytically determined because:

- v. estimated average observer coverage for the LL-DOL between 2017 and 2021 was 9%, although there are some discrepancies between data sources. In any case, none of the fishing operations performed on board the fiberglass skiff is being observed (and the number of registered fiberglass skiffs (2.844 in 2022 according to MPCEIP 2022b) is more than 10 times higher than the number of mothership vessels (244).
- vi. The number of interactions per observed number of hooks fished is not provided in MPCEPI (2022c). But based on data presented in MPCEIP (2022e) it can be estimated that less than 1% of the total hooks used are being observed (probably no more than 0,3%).
- vii. The fate of the interacted individuals (alive/dead) is not reported, although observers are thought to record this data.
- viii. There is a remark inconsistency in the observers data (eg. interactions reported by the MPCEIP in 2021 are totally different depending on the source used, observer records should account for a higher species diversity -including shark species- than landings and this is not observed in the data sets provided for this assessment).

Thus, all protected sharks are considered as Data Deficient species (DD) and RBF shall be triggered for its assessment, with the only exception of the silky shark (C.falciformis). In the case of the silky shark a national regulation passed in 2022 allows longline fisheries to retain incidentally caught individuals if they account \leq 20% of the total catches (in weight) per fishing trip. Since this threshold is well above the historical bycatches of this species in this fishery, landing data is considered as a reliable data source to assess the impact of this fishery on this species, which will be assessed using PI 2.3.1(a).

b) Conservation and management measures

At a national level, Article 152 of he LODAP prohibits targeting any species of elasmobranchs, as well as manufacture, transport, importation, commercialization of fishing gears used to target these resources, and shark finning. Besides, the following shark-specific regulations are highlighted:

- Executive Decree Nº486 (30th July 2007): It prohibits directed shark fishing, shark-finning, and the use of steel leaders. This regulation was later amended by the Executive Decree Nº902 (1st February 2008). These regulations set that the retention on board of whale sharks (*Rhincodon typus*), basking sharks (*Cetorhinus maximus*), white sharks (*Carcharodon carcharias*), sawfish or catfish (*Pristis spp*.) is prohibited. Besides, National Action Plan for the Conservation and Management of sharks (PAT -Ec 2013-2018) was adopted as a policy of the Ecuadorian State.
- Ministerial Agreement Nº MPCEIP-SRP-2019-0019-A: This regulation sets that the retention on board of Spotted eagle ray (*Aetobatus laticeps*) and Snouted eagle ray (*Myliobatis longireostris*) is prohibited. All incidental catches (dead or alive) shall be immediately de-hooked and returned to the sea.
- Ministerial Agreement N^oMPCEIP-SRP 2020-0084-A: This regulation sets that the retention on board of Smooth hammerhead shark (*Sphyrna zygaena*), Scalloped hammerhead (*S.lewini*), Bonnethead (*S.tiburo*), Great hammerhead (*S.mokarra*) and Oceanic whitetip shark (*C.longimanus*) is prohibited. All incidental catches (dead or alive) shall be immediately de-hooked and returned to the sea. This regulation also activated the scientific advisory committee for the PAT-Ec (2020-2024).
- Ministerial Agreement N^oMPCEIP-SRP 2022-0002-A: This regulation updates the conservation and management measures in Ecuador for the silky shark (*C.falciformis*). This regulations sets that the retention of silky shark on board purse seiners is prohibited, while and incidental catches by longliners authorised for targeting large pelagic fish shall be lower than 20% of the total catches (in weight) per fishing trip (and individuals smaller than 100cm TL are not allowed). Thus, this regulation is stricter than IATTC Resolution C21-06. Fishing in nursery areas (identified by the SRP in coordination with the SAC-IATTC) shall be prohibited.
- Ministerial Agreement N^oMPCEIP-SRP-2022-SRP-0068-A. This regulation ensured that the National Action Plan for the Conservation and Management of sharks (PAT -Ec 2020-2024) was adopted as a policy of the Ecuadorian State.
- Ministerial Agreement N^o MPCEIP-SRP-2022-0078-A: This regulation prohibits all fishing targeting any species belonging to the Mobula Genus: Mobula birostris, Mobula mobular. Retention on board any fishing



vessel is prohibited. All incidental catches (dead or alive) shall be immediately de-hooked and returned to the sea.

The specific objectives of the <u>National Action Plan for the Conservation and Management of Sharks of Ecuador (PAT-</u> <u>Ec 2020-2024</u>) are listed below (quoted from Agreement MPCEIP-SRP-2022-0068-A), which were identified through participatory methodologies. It is in these specific objectives where the different actions to be carried out during the implementation of the PAT-Ec are framed:

- **Objective 1**. Implement a fishing information system. Define and implement an information system that ensures the automation of data from its capture to its commercialization and that, by integrating the data throughout the chain, as well as with information from external entities, allows cross-data analysis and report generation. resource condition.
- Objective 2. Determine inventories, distribution, habitats and Threatened populations. Establish inventories of shark populations and their spatial-temporal distribution within the maritime territory of Ecuador (coastal and insular). Determine critical habitats and particularly threatened populations.
- Objective 3. Establish applied research programs focused on supporting decisions for sustainable management. Systematize a Scientific Research process for which the related entities, together with the SRP and IPIAP must structure a Research Plan and put it into execution considering various local, national and regional actors. This objective also seeks to structure scientific links with specialized entities worldwide (NOAA, CIAT, IFREMER, among others).
- Objective 4. Develop adaptive management measures (technical and regulatory). Update management measures, both technical and regulatory, based on the information generated from Objectives 1, 2 and 3, generating a system of cyclical improvement of the regulatory framework with dynamic, timely and precautionary characteristics. For this purpose, there must be capacity in human resources and data management that allows the analysis and issuance of indicators about the sustainability and recovery of the resource. This Objective also seeks to develop Binational and Regional coordination mechanisms for the approval of National PATs (of their actions) and regulations with neighboring countries.
- **Objective 5.** Develop and implement an extension program focused on sustainable management of the shark resource. Develop capacities and establish an extension and education program on the sustainable conservation of sharks, rays, guitarras and chimaeras throughout the maritime territory of Ecuador.
- Objective 6. Improve surveillance, control and enforcement of applicable regulations. Prevail the application of the regulations in fishing activities, as well as make the process to comply more expeditious between updating the regulations and their entry into force through fishing inspectors and control agencies. Improve the effectiveness of the control of fishing gear in order to minimize incidental catches. Likewise, seek better coordination with the Environmental Authority for the protection of species in danger of extinction or with levels of protection. The improvement of Control and Surveillance will require a close and automated exchange of information with the Police, the Ecuadorian Navy and the Environmental Authority, including in particular the records of infractions and the elaboration of user risk profiles.

The following IATTC Resolutions are applicable to the sharks captured in association with tuna fisheries in the Convention Area:

- Resolution C-05-03: Resolution on the conservation of sharks caught in association with fisheries in the Eastern Pacific Ocean. Among other measures, this Resolution set reporting procedures for shark catches, set a limit to ratio of fin-to-body weight, and also set that incidental shark catches shall be release alive. Besides, it recommends CPCs to establish and implement a national plan of action for conservation and management of shark stocks, and also to take the measures to ensure that fishers fully utilize any retained catches of sharks, and. This Resolution was latter amended by Resolution C-16-04.
- **Resolution C-11-10**: Resolution on the conservation of oceanic whitetip sharks (*C.longlimanus*) caught in association with fisheries in the Antigua Convention area. CPCs shall prohibit retaining onboard, transhipping, landing, storing, selling, or offering for sale any part or whole carcass of oceanic whitetip sharks in the fisheries covered by the Antigua Convention. All interactions shall be recorded and reported and, to the extent practicable, promptly released unharmed.
- Resolution 15-04: Resolution on the conservation of mobulid rays caught in association with fisheries in the iattc convention area. Members and Cooperating Non-Members (CPCs) shall prohibit retaining onboard, transshipping, landing, storing, selling, or offering for sale any part or whole carcass of Mobulid rays (which includes Manta rays and Mobula rays) caught in the IATTC Convention Area. All interactions shall be recorded and reported and, to the extent practicable, promptly released unharmed. Some best handling and releasing practices are detailed as Annex. As an exception, the requirements of this resolution do not apply to developing CPCs' small-scale1 and artisanal fisheries exclusively for domestic consumption.



- Resolution C-16-05: Resolution on the Management of shark species. Among other measures (mainly
 addressed to purse seine fisheries), CPCs shall prohibit longline vessels flying their flag and targeting tuna or
 swordfish in the Convention Area from using "shark lines" (individual lines attached to the floatline or to the
 floats directly, and used to target sharks).
- **Resolution C-19-06**: Resolution on the conservation of whale sharks. This Resolution is addressed to avoid interactions between whale sharks and purse seiners.
- **Resolution C-21-06:** This Resolution amended Resolution C-19-05, with special emphasis on the silky shark (C. falciformis), for the years 2022 and 2023. Amont other measures, this Resolution sets that CPCs shall require all longline vessels whose fishing licenses do not include sharks as a fishing target but catch sharks incidentally, to limit bycatch of silky sharks to a maximum of 20% of the total catch by fishing trip in weight. The 20% limit is set as an interim limit in the absence of data and scientific analysis on which to base conservation and management measures, and will be revised, based on recommendations by the scientific staff, once improved species-level catch and composition data are available. CPCs shall require their multi-species fisheries using surface longlines to limit the catch of silky sharks of less than 100 cm total length to 20% of the total number of silky sharks caught during the trip. CPCs that allow retention of silky sharks by their longline vessels, shall ensure compliance with the measures established above by means of control and inspection mechanisms, for Port CPCs and Flag CPCs, as applicable. At a minimum, such mechanisms shall require effective inspections at the time of first unloading in port or the submission of catch logbooks that will allow for species identification, verification of size when caught, and enforcement of applicable sanctions such as prevention of entry into markets of product caught in violation of this measure. Where applicable, internationally recognized certification and reporting procedures for the conservation of silky sharks may be used for fulfilling the obligations of this paragraph. CPCs shall inform the IATTC Secretariat of the use of said certification procedures. Data derived from these control and inspection measures shall be communicated to the Secretariat, in accordance with IATTC data submission. For those multi-species fisheries using surface longlines that have captured more than 20% of silky sharks in weight on average in a year, CPCs shall prohibit the use of steel leaders during a period of three consecutive months each year. The average proportion of silky sharks in the catch will be calculated from data of the previous calendar year. New vessels entering the multi-species fisheries affected by this Resolution and those for which no data are available from the period immediately prior shall be subject to the provisions detailed. This Resolution shall be reviewed by the SAC in 2023. Vessels of less than 12 m length overall using manually operated fishing gear (i.e. without mechanical or hydraulic winches) and that do not deliver to motherships at any time during the fishing trip are excluded from the application of this resolution. For this excluded fleet, CPCs shall continue working with the Commission's scientific staff on the strengthening of data-collection programs, which shall be presented at the meeting of the SAC in 2023.

III. Seabirds

a) Impact of the UoA

Bycatch in longline fisheries is considered one of the main threats for the conservation of albatrosses and petrels worldwide (Jimenez et al. 2012).

As far as the team is aware, no records of interactions with seabirds have been reported by observers on board. However, this fishery operates across an enormous area in oceanic waters (see map in **section 5.1.3**), where different species of albatrosses and petrels protected by the Agreement on the Conservation of Albatrosses and Petrels (ACAP) are known to dwell. Thus, seabirds will also be considered as ETPs to be assessed in this report.

The low observer coverage already discussed in previous subsections compromises the representativeness of the lack of interactions recorded, especially in the case of species with very low interaction frequencies, as would be the case of seabirds. Thus, the team considers that the impact of the UoA on protected seabirds (in particular albatrosses and petrels) cannot be analytically determined. Thus, are all considered as Data Deficient ETP components that shall be assessed using the RBF.

a) Conservation and management measures

The International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries (IPOA-Seabirds) is a voluntary tool elaborated by FAO within the framework of the Code of Conduct for Responsible Fisheries. In implementing the IPOA-SEABIRDS States should carry out a set of activities. This should be done as appropriate in conjunction with relevant international organizations. The exact configuration of this set of activities will be based on an assessment of the incidental catch of seabirds in longline fisheries.

IATTC Resolution C-11-02 to mitigate the impact on seabirds of fishing for species covered by the IATTC sets that CPCs shall report to the IATTC on their implementation of the IPOA-Seabirds, including the status of their National



Plans of Action for reducing incidental catches of seabirds in longline fisheries. Besides, CPCs shall require their longline vessels of more than 20m length that use hydraulic, mechanical or electrical systems and that fish covered by the IATTC in the EPO within the areas shown in **figure 7.3.1.1** to use at least two of the mitigation measures shown in **table 7.3.1.7**, including at least one from Column A. The regulation also encourages CPCs to establish observer programs on longline fleets to gather information on the interactions with seabirds. Annual reporting on the recorded interactions is mandatory.

Figure 7.3.1.1. Areas (shaded) within the EPO in which the use of at least two mitigation measures for reducing seabird bycatch is required: north of 23°N (except in Mexican waters) and south of 30°S, plus the area bounded by the coastline at 2°N, west to 20°N-95°W, south to 15°S-95°W, east to 15°S-85°W, and south to 30°S. Source: IATTC C-11-02.



Table 7.3.1.7. Mitigation measures listed in C-11-02.

Column A	Column B
Side-setting with bird curtains and weighted branch lines ²	<i>Tori</i> line ³
Night setting with minimum deck lighting	Weighted branch lines
<i>Tori</i> line	Blue-dyed bait
Weighted branch lines	Deep-setting line shooter
	Underwater setting chute
	Management of offal discharge

(3) If tori line is selected from both Column A and Column B this equates to simultaneously using two (i.e. paired) tori lines.

Ecuador signed and ratified the ACAP in 2003, and it is in force since February 2004 (click <u>here</u> for more details). However, despite the fishing area falls within the area depicted in Figure 7.3.1.1 the team is not aware that the UoA has implemented any of the mitigation measures listed in **Table 7.3.1.7**. In a letter sent to IATTC (<u>Oficio Nro. MPCEIP-SRP-2022-0679-O</u>), the SRP states that the target species of this fleet are dolphin fish and swordfish, which are not covered by the IATTC.

IV. Marine mammals

a) Impact of the UoA

Direct interactions with marine mammals occur more frequently in passive (e.g. gillnets, longlines) than in active fishing gear such as trawling (Read, 2005). Among passive gears, gillnets are known to cause higher mortalities in marine mammals than longlines. However, regular interactions with surface longlines, either by getting hooked or entangled in buoy lines or main lines, have been documented in similar fisheries around the world (Passadore et al 201).

As far as the team is aware, no records of interactions with marine mammals have been reported by observers on board. However, this fishery operates across an enormous area in oceanic waters (see map in **section 5.1.3**), where different species of marine mammals dwell.

The low observer coverage already discussed in previous subsections compromises the representativeness of the lack of interactions recorded, especially in the case of species with very low interaction frequencies, as would be the case of



marine mammals. Thus, the team considers that the impact of the UoA on marine mammals cannot be analytically determined. Thus, are all considered as Data Deficient ETP components that shall be assessed using the RBF.

b) Conservation and management measures

Ecuador protected all whales within its EEZ through the Ministerial Agreement 196 passed in June 1990, and more recently extended this protection to all marine mammals through the Ministerial Agreement MPCEIP-SRP-2021-0238-A. Fishers are due to record all interactions with marine mammal in their logbooks (Article 225, Executive Decree N^o 362), while observers are also due to report all observed interactions. Thus, marine mammals will also be considered as ETPs to be assessed in this report.

At international level, Ecuador has signed and ratified the Agreement on the International Dolphin Conservation Program (AIDCP), a legally-binding multilateral agreement. The IATTC provides the Secretariat for the program, which covers the Eastern Pacific Ocean.

7.3.1.5 Marine habitat

According to MSC requirements (SA 3.13.1), the team shall assess the habitats component in relation to the effects of the UoA on the structure and function of the habitats impacted by the UoA. The habitat's structure and function (i.e., the ecosystem services that it provides), including abundance and biological diversity, is of concern in an MSC assessment. Thus, an assessment should look not only at the impact on the habitat but also the habitat's delivery of ecosystem services.

Prior to the assessment of the habitats component, the team shall determine and justify which habitats are commonly encountered, vulnerable marine ecosystems (VMEs), and minor (i.e., all other habitats).

Commonly encountered habitats

Commonly encountered habitats are defined by MSC Requirements (FCR GSA3.13.3.1) as those preferred by the target species, that the UoA's gear is designed to exploit, and/or make up a reasonable portion of the UoA's fishing area.

The mahi mahi fishery with the doradero gear takes place at around 9-14 m depth, therefore, the epipelagic habitat in the Southeastern Pacific Ocean is considered as the commonly encountered habitat for the purpose of this assessment.

The assessment team is not aware of any evidence of adverse impacts on the structure or functioning of the pelagic habitat by the doradero. The fishery doesn't change the characteristics of the water column, e.g., the temperature, salinity, or currents.

VMEs

According to MSC FCR GSA3.13.3.2, VMEs have one or more of the following characteristic, as defined in paragraph 42 of the FAO Guidelines: (i) Uniqueness or rarity; (ii) Functional significance of the habitat, (iii) Fragility; (iv) Life-history traits of component species that make recovery difficult; (v) Structural complexity.

The FAO Guidelines' Annex identifies the following species groups, communities, and habitat-forming species that may form VMEs and may be indicative of the occurrence of VMEs: (i) Certain coldwater corals and hydroids; (ii) Some types of sponge-dominated communities; (iii) Communities composed of dense emergent fauna where large sessile protozoans and invertebrates (e.g., hydroids and bryozoans) form an important structural component of habitat; (iv) Seep and vent communities comprised of invertebrate and microbial species found nowhere else (i.e., endemic).

The FAO Guidelines' Annex also lists various geographical features that are often associated with these communities.

Epipelagic habitats in open waters are not included in the definition of paragraph 42, subparagraphs (i)-(v) of the FAO Guidelines on Vulnerable Marine Ecosystems (VMEs), as described in MSC FCR GSA3.13.3.2. Therefore, no VMEs were identified in this assessment.

Minor habitats

Minor habitats are defined by MSC as those that do not fall within the classification of Commonly Encountered Habitats or VMEs (GSA3.13.3).

Taking into account that the whole fishing area is considered a commonly encountered habitat, no minor habitats have been identified in this assessment.



Large Marine Ecosystems (LMEs)

The Large Marine Ecosystem or LMEs (http://www.lme.noaa.gov/) are defined as "areas of the ocean characterized by distinct bathymetry, hydrology, productivity and trophic interactions" (**Figure 7.3.1.8**). The UoA fishing occurs within two LMEs, the Pacific Central-American Coast and the Humboldt Current.

The Pacific Central-American Coastal LME (Heileman, 2009), extends along the Pacific Coast of Central America, from 22° N off Mexico down to 4° S. It is shared by Mexico, Guatelama, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia and Ecuador. The LME covers a surface area of nearly 2 million km², of which 1.42% is protected, and includes 0.22% of the world's coral reefs and 0.78% of the world's sea mounts (Sea Around Us, 2007). Recirculating coastal currents and milder temperatures than those of the adjacent California Current and Humboldt Current LMEs characterize this LME (Bakun et al., 1999). Much of the Pacific Central-American Coastal LME is influenced by the seasonal movements of the Inter-tropical Convergence Zone (Bakun et al., 1999). The region is vulnerable to the ENSO phenomenon, which affects productive activities, infrastructure, natural resources and the environment in general. The climate varies from tropical to temperate, with a dry period during the winter months. During the rainy season from May to September, rivers discharge significant volumes of fresh wter and suspended solids into the coastal areas of this LME (Windevoxhel et al., 2000). Extreme ocean depths are reached very close to the coast due to a narrow and steep continental shelf.



Large Marine Ecosystems of the World and Linked Watersheds

Figure 7.3.1.8 Map showing the 64 Large Marine Ecosystems (LMEs) of the world. LMEs in this map are numbered as they are on the LME website, www.lme.noaa.gov.



The Humboldt Current LME (Heileman et al., 2009), extends along the west coast of Chile and Peru. It has a surface area of 2.5 million km², of which 0.11% is protected, and contains 0.42% of the world's sea mounts and 24 major estuaries (Sea Around Us, 2007). The LME's circulation patterns are described by several authors including Wyrtki (1967), Alheit and Bernal (1993) and Wolff et al., (2003). Ekman offshore divergence due to the southerly trade winds gives rise to the world's largest coastal upwelling system that characterizes this LME. This system shows high climatic as well as oceanographic variability associated with seasonal, interannual, decadal and longer-term changes. Considerable interannual variability occurs when the normal seasonal upwelling is interrupted by ENSO, which results in intrusions of warm, clear oceanic waters from the west and north (Wolff et al., 2003, Alheit and Ñiquen, 2004).

The eastern tropical Pacific region, which encompasses the continental coasts of southern Central America (Costa Rica and Panama) and of northwestern South America (Colombia and Ecuador) is characterized by cliffs alternating with pocket beaches, alluvial and deltaic plains with extensive sandy beaches, well-developed mangrove forests, estuaries, lagoons, and, reefs (Miloslavich et al., 2011). It also includes important offshore island systems such as the Pearl and Galapagos islands (Cruz et al., 2003; Díaz & Acero, 2003). The Peruvian coast also is diverse with bays, cliffs, kelp and macroalgal beds, rocky shores and sandy beaches, islands, and peninsulas, as well as wetlands, which include the southernmost limit to the tropical Pacific mangrove ecosystem (Tarazona et al., 2003; Fernandez-Baca et al., 2007).

Marine Biodiversity

Regarding the marine biodiversity in the Tropical East Pacific (Miloslavich et al., 2011): Ecuador, Colombia, Panama, and Costa Rica, at least 6,714 species-level taxa were been reported in the Pacific coastal waters of Costa Rica, Panama, Colombia, and Ecuador, from four Protista groups, (Foraminifera, Radiolaria, Tintinnida, Dinoflagelata), two plant phyla (algae, angiospermae), and 30 animal phyla.

Analysis of the compiled data on the marine biodiversity in the Humboldt Current (Miloslavich et al., 2011), i.e., Chile and Peru, indicated three zones of high richness for this region (**Figure 7.3.1.9**): (a) the northern Peruvian coast between 5° and 8°S, with 501 species, 270 genera, and 193 families at the point of maximum diversity; (b) the northern Chilean coast between 22° and 24°S, with 431 species, 273 genera, and 159 families at the point of maximum diversity; and (c) the southern Chilean coast between 52° and 56°S, with 522 species, 324 genera, and 188 families at the point of maximum diversity. The current diversity of the HC includes 10,201 species. Amphipoda, Gastropoda, and Polychaeta are the taxa with the greatest number of described species.





Figure 7.3.1.9 Species richness in the Humboldt Current subregion. Scale represents number of species. (Source: Miloslavich et al., 2011)

Food web

As species mostly interact through predation, the existence of top-down control (**Figure 7.3.1.10**), which means the regulation of lower food-web components by one or several upper-level predators, should be critical in the functioning of marine ecosystems (Cury et al., 2001).





TOP-DOWN

Figure 7.3.1.10 (a) Top-down control within a simplified four-level food web in a marine ecosystem. (b) The decreasing size of the top predator populations lead to a reduced predation on the prey that leadsto an increase in the abundance of the prey fish. The increased predation of the fish prey on thezooplankton lead to a decrease in the population size. The diminution of the zooplankton abundancereduces the grazing pressure on the phytoplankton, which consequently becomes more abundant. (Source: Cury et al., 2001)

Mahi mahi are usually confined to the upper 30 m of the water column, or between the surface and the thermocline (< 30 m) (Palko et al., 1982; Tripp-Valdez et al., 2015). Like other large pelagic fishes, this species plays an important role in epipelagic ecosystems, since it may delineate the structure of the food-webs by top-down controls. Previous trophic biology studies carried out in the Northern Pacific Ocean, Atlantic Ocean and Mediterranean Sea have revealed that *C. hippurus* feeds on a wide variety of fish and invertebrate pelagic organisms (Oxenford & Hunte, 1999; Tripp-Valdez et al., 2015), and so has been defined as a non-selective and generalist predator (Massutí et al., 1998; Castriota et al., 2007).

The diet and the feeding habits of mahi mahi (*Coryphaena hippurus*) in the Pacific coast of Ecuador was assessed by examining 320 stomachs of individuals ranging from 51 to 149 cm in total length (Varela et al., 2016). Fish was the predominant prey group in the diet followed by cephalopods and crustaceans. Among the 17 prey items that made up mahi mahi's diet, the Exocoetidae family was the most important prey, *Dosidicus gigas* being the most abundant invertebrate species. The results of this study indicate that mahi mahi is an opportunistic feeder, which is capable of consuming a wide variety of schooling epipelagic organisms (Varela et al., 2016).



According to Varela et al (2016), in the Ecuadorian Pacific mahi mahi has a varying degree of specialization on different prey taxa (**Figure 7.3.1.1**). Thus, *Hippocampus hippocampus, Lagocephalus lagocephalus*, Gobiidae and *Argonauta* sp. showed low occurrence and low prey-specific abundance (lower left), suggesting that all these species are unimportant and rare prey. Scombridae, *Pleuroncodes planipes, Portunus xantusii* and *Opisthonema libertate* showed low occurrence and high prey-specific abundance (upper left), indicating they are predated by a low number of individuals. Exocoetidae, located in the upper central area of the graph, may be considered the most important prey species, since it was found in a high percentage of stomachs (i.e., 39.39%). In spite of the fact that some individuals predated on a small proportion of prey, many of them fed on the dominant taxa (Exocoetidae).

Figure 7.3.1.11 Prey-specific abundance plotted against frequency of occurrence of prey species for common dolphinfish from the Pacific coast of Ecuador. The two diagonal axes represent the importance of prey (dominant vs rare) and the contribution to the niche width (high between-phenotype vs high within-phenotype contribution); the vertical axis defines the predator feeding strategy (specialist vs generalist). Aspp, *Auxis* spp.; Arsp, *Argonauta* sp.; Dd, *Dosidicus*



Occurrence (%)

gigas; Esp, Engraulis sp.; Ex, Exocoetidae; Go, Gobiidae; Hh, Hippocampus hippocampus; Ll, Lagocephalus lagocephalus; Ol, Opisthonema libertate; Sc, Scombridae; Tsp, Trachinotus sp.; Pp; Pleuroncodes planipes; Px, Portunus xantusii. (Source: Varela et al., 2016.)

7.3.1.7 MPAs

Ministerial agreement 134 of July 24, 2007, declared the area from the shore of Ecuador's continental coast profile up to a nautical mile into the sea a Reserve Area for the production of bio-aquatic species. In this reserve area the following is allowed:

- a) The collection, extraction or manual capture of crustaceans and molluscs by traditional artisanal fishers.
- b) The use of traditional artisanal fishing gears such as the cast nets ("atarraya"), or hand lines.
- c) Sport fishing with hand line and / or fishing rod.
- d) Capture of oysters or other mollusks by freediving.
- e) Non-extractive sport diving.
- f) Extractive APNEA sport diving or freediving.
- g) Extraction of existing resources under all fishing modalities, only for scientific purposes.

In addition, Ministerial Agreement 2305 RO #3 of August 6, 1984 and Ministerial Agreement 080 of march 19, 1990 declared a fishing area (within 8 nautical miles) reserved exclusively for artisanal fishers. Within this fishing area,



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artisanal fishers as well as the industrial shrimp (*Protrachypene precipua*) trawling fishing fleet are allowed to fish, subject to the Fishing Law and its Regulations.

Moreover, the country is part of the East Tropical Pacific Marine Corridor (CMAR), a regional initiative led by the governments of Costa Rica, Panama, Colombia and Ecuador. The CMAR has among its objectives, to promote the management and conservation of marine resources, improve and consolidate the management of Marine Protected Areas that make up the corridor, and establish a regional framework that facilitates the development and integral management of the corridor compatible with national policies and laws (León Cabrera, 2018; https://www.iucn.org/es/content/corredor-marino-del-pac%C3%ADfico-este-tropical-cmar).

The marine protected areas in the South Eastern Pacific Ocean in the area where the UoA fishery operates is shown in **Figure 7.3.1.12**. The characteristics of each of these areas can be consulted in websites such as the MPAtlas website (http://mpatlas.org/explore/) or the protected planet website (http://www.protectedplanet.net/).

By overlapping both figures (**Figure 7.3.1.13**), it can be observed that protected habitats susceptible to being affected by the fleet being assessed are either the Galapagos Islands or coastal habitats, which are unlikely to be impacted by the the doradero (thin surface longline), whose hooks are set around 6-13 m depth (Martínez-Ortíz & Zúñiga-Flores, 2012; Martínez-Ortiz et al., 2015) in oceanic waters as far as 100° W, west of the Galapagos Islands.



Figure 7.3.1.12 Marine protected areas in the Eastern Pacific Ocean, © Marine Conservation Institute 2019. Source: MPAtlas website (http://mpatlas.org/explore/).





Figure 7.3.1.13 Map of the marine protected areas in the Eastern Pacific Ocean with the Mahi mahi's fishing activity from 2008 – 2011 overlapped. Note: the blue squares are mother-ships, while the orange squares are the independent fiberglass vessels.



7.3.2 Principle 2 Performance Indicator scores and rationales

PI 2.1.1 – Primary species outcome

PI 2	2.1.1	The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI			
Scorin	g Issue	SG 60	SG 80	SG 100	
	Main pri	mary species stock status			
а	Guide post	Main primary species are likely to be above the PRI. OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI. OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.	
	Met?	N/A	N/A	N/A	
Ration	Rationale				

A comprehensive list of all species impacted by the two UoAs between 2013 and 2021 is presented in **section 7.3.1.1**. A total of 50 different species and taxa molluscs, cartilaginous fish and teleosts were impacted by UoA1 during that period. Besides, incidental interactions with 5 species of marine turtles were recorded. Among all these P2-species, no main primary species were identified by the team (see **table 7.3.1.1.6**).

Based on the following MSC interpretation (https://mscstandards.my.site.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344), this SI is not applicable(N/A).

	Minor pr	mary species stock status
		Minor primary species are highly likely to be above the PRI.
h	Guide	OR
D	post	If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
	Met?	EPO BET: Yes EPO YFT: Yes EPO SKJ: Yes
Ration	ale	

As detailed in section 7.3.1, only 3 minor primary stocks are impacted by the UoA: EPO bigeye (*Thunnus obesus*), EPO yellowfin tuna (*T.albacares*), and EPO skipjack tuna (*Katsuwonus pelamis*). The relative contribution of these three



species to the total annual landings is low. The average annual contribution during the period 2013-2021 was 0,9% (see **table 7.3.1.3**), with yellowfin tuna accounting for most of that contribution (0,8%). The UoA's annual catches of tropical tunas range between 0,9 tons (in 2020) and 191,4 t (in 2016). Thus, the UoA catches of each of the tropical tuna species are almost negligible at EPO stock level.

EPO Bigeye tuna

The results from the latest stock assessment performed in 2019 (Xu et al., 2020) show at the beginning of 2020, the spawning biomass (S) of bigeye ranged from 51% to 532% of the limit reference level (S_{limit}); 5 out of the 44 model runs for the benchmark assessment suggested that it was below that limit. The results also showed that $S_{current}$ ranged from 14% to 212% of the level at dynamic MSY;

Besides, results in Xu et al 2020 indicate that during the period 2017-2019, the fishing mortality (F) of yellowfin ranged from 32% to 114% of the limit reference level (Flimit), and 3 models suggested that it was above that limit.

The results from the reference models are combined in a risk analysis to provide management advice (Aires et al, 2020b). The probabilities of exceeding the reference points where computed using each model result and its associated weight, the final estimates are shown in figure below. The probability of the spawning biomass being lower than the S_{MSY} were relatively high (53%), while the probability of being below S_{limit} were 6%. In relation to fishing mortality (F), the combined distribution suggests that the probability of *Fcur* being higher than the limit reference level is 5%. However, the combined probability distribution is bimodal and the combined risk curve based only on pessimistic models shows that the probability of *Fcur* being higher than the limit reference level reaches 10% (which is the threshold set in the HCR, C-16-02, to trigger management actions to reduce F). However, even if the pessimistic scenario is correct, the probability of exceeding the limit reference point is 10% or slightly higher.

Based, on the information discussed above, the team considers that there is a high degree of certainty (>80th%ile) that the stock is above PRI. Thus, **SG100 is met.**



Figure PI2.1.1.2. Kobe plot of the most recent estimates of spawning biomass (S) and fishing mortality (F) relative to their MSY reference points (SMSY_d and FMSY) estimated by the 44 converged reference model runs (see Table 4). Each dot is based on the average F over the most recent three years. The dashed lines represent the limit reference points averaged for the 44 converged reference model runs. The error bars represent the 95% confidence interval of the estimates. The black, purple, and green dots are the combined estimates across all models, all pessimistic models, and all optimistic models, respectively. Source: IATTC, 2022, figure D-8.

EPO Yellowfin tuna

The results from the latest stock assessment performed in 2019 (Minte-Veral et al., 2020) show at the beginning of 2020 the spawning biomass (S) of yellowfin ranged from 145% to 345% of the limit reference level (S_{limit}); There were 48 model runs for the benchmark assessment representing 12 different model configurations, but no models suggest that it was below that limit. The results also showed that $S_{current}$ ranged from 49% to 219% of the level at dynamic MSY.

Besides, results in Minte-Vera et al 2020 indicate that during the period 2017-2019, the fishing mortality (F) of yellowfin ranged from 22% to 65% of the limit reference level (Fimit), and no models suggested that it was above that limit.



The results from the reference models are combined in a risk analysis to provide management advice (Aires et al, 2020b). The probabilities of exceeding the reference points where computed using each model result and its associated weight, the final estimates are shown in figure below. The probability of the spawning biomass being below S_{MSY} is low (12%). The probability of the spawning biomass being below S_{limit} is zero. Besides, there is a low probability of $F_{current}$ being above F_{MSY} (9%). The probability of $F_{current}$ being above F_{limit} is zero.

Based, on the information discussed above, the team considers that there is a high degree of certainty (>80th%ile) that the stock is above PRI. Thus, **SG100 is met.**



Figure PI2.1.1.2. Kobe (phase) plot of the time series of estimates of spawning stock size (*S*) and fishing mortality (*F*) of yellowfin tuna relative to their MSY reference points. The colored panels are separated by the target reference points (*S*MSY and *F*MSY). Limit reference points (dashed lines), which correspond to a 50% reduction in recruitment from its average unexploited level, based on a conservative steepness (*h*) of 0.75 for the Beverton-Holt stock-recruitment relationship, are merely indicative, since they vary by model and are based on all models combined. The center point for each model indicates the current stock status, based on the average fishing mortality (*F*) over the last three years; The solid black circle represents all models combined; to be consistent with the probabilistic nature of the risk analysis and the HCR, it is based on P(*Scur/SLIMIT<x*) = 0.5 and P(*Fcur/FMSY>x*) = 0.5. The lines around each estimate represent its approximate 95% confidence interval. Source: IATTC, 2022, figure B-9.

EPO Skipjack tuna

An interim stock assessment has been produced in 2021 (Maunder et al., 2022). Although the assessment is termed interim by the IATTC scientific staff that prepared the document, it is considered as reliable for management advice. However, the model will continue to be improved towards the benchmark assessment in 2024, including incorporating the results of the analysis of recently collected tagging data (IATTC, 2022).

As in previous in previous stock assessment of skipjack in the EPO, MSY-based quantities could not be estimated because the tradeoff between growth and natural mortality, in combination with the assumption that recruitment is independent of stock size, implies fish should be caught at the youngest ages to maximize yield, implying that the optimal fishing mortality should be infinite. So a proxy target reference point is needed. Maunder et al (2022) used the depletion ratio $S_{MSY}/S_0= 0,30$ (based on values for bigeye and yellowfin) as a conservative target reference proxy. In contrast, the limit reference points used for the HCR adopted in C-16-02 are not based on maximizing yield and can be calculated. Besides, several issues were addressed to estimate this ratio, so a dynamic depletion ratio (SBR_d) was used to evaluate the stock status against the target reference point while an equilibrium ratio adjusted by the average recruitment (SBR) was used to evaluate the stock status against the limit reference point.

The reference model used by Maunder et al (2022) estimated that the spawning biomass is currently above the target proxy of 30% of the unexploited spawning biomass under either the static (SBR) or the dynamic (SBR_d) spawning biomass ratio. Only three of the sensitivity analyses estimate that the stock is below the proxy target, but none of these estimate that the stock is below the limit reference point.

The IATTC harvest control rule takes uncertainty into consideration, particularly for the limit reference point. The estimates of uncertainty for the reference model do not exceed the limit reference point (see **figure PI2.1.1.3**).

In relation to fishing mortality, the target proxy was selected as the fishing mortality corresponding to the target biomass (F0.3). The current fishing mortality estimated by the reference model is lower than that corresponding to the biomass target for the reference model (see **figure PI2.1.1.4**).



Based, on the information discussed above, the team considers that there is a high degree of certainty (>80th%ile) that the stock is above PRI. Thus, **SG100 is met**



Figure PI2.1.1.3. Spawning biomass ratio (SBR) for skipkjack tuna in the EPO, 2006-2021 estimated by the reference model. The solid lines represent the maximum likelihood estimates and the shaded area the approximate 95% confidence intervals around those estimates. The red dashed horizontal line (at 0.077) identifies the SBR at S_{limit}. Source: Maunder et al. 2022. Figure 16.



SB/SBtarget

Figure PI2.1.1.4. Kobe plot showing the stock status estimates from all the models. The red cross indicates the status using the reference model. Source: Maunder et al. 2022. Figure 40.

References

Aires et al, 2020b IATTC, 2022 Maunder et al., 2022 Minte-Veral et al., 2020

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

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

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.1.2 – Primary species management strategy

PI 2	2.1.2	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch			
Scorin	g Issue	SG 60	SG 80	SG 100	
	Manager	nent strategy in place			
а	Guide post	There are measures in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a partial strategy in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a strategy in place for the UoA for managing main and minor primary species.	
	Met?	Yes	Yes	No	
Rationale					

All 3 tropical tuna stocks (EPO BET, EPO YFT, EPO SKJ)

At the national level, the key management measures affecting primary species caught by the UoA are the technical gear specifications, dolphinfish closed season (which means that the fleet changes its gear from LL-DOL to LL-TBS to target tunas, billfishes and sharks), closed census, data reporting obligations (mandatory logbooks, and Article 225 of the Ex.Decree 362/2022 states that all interactions shall be recorded), observer program in place, and inspections at port to obtain the landing certificate. Landing data confirm that these measures ensure that the UoA (which includes only LL-DOL) maintains the level of bycatches of all non-targeted species at low levels, with all three tropical tunas accounting for less than 1% of the total annual UoA landings and maximum annual catches of less than 200t for the three species together (the average annual contribution during the period 2013-2021 was 0,9%, see **table 7.3.1.3**).

All 3 tropical tuna stocks are subject to IATTC management actions, supported by regular assessments of stock status and an extensive monitoring and review framework. IATTC serves to coordinate the management of the shared stocks of tuna in the Eastern Pacific Ocean (EPO) by the many coastal states that are parties to the IATTC Convention.

Resolution C-16-02 adopted in 2016 set interim limit reference point of $F_{0.5R0}$ and $S_{0.5R0}$, and interim target reference points that should be achieved and maintained as S_{MSY} and F_{MSY} , establishes HCR for the purse-seine fishery to restore the stocks in the greater of two generations or five years, and confirms that efforts will be made to ensure compatibility with WCPFC management of these species. Despite this measure is not applicable to the longline fishery, it has a significant impact on the status of these stocks, since over 90% of the catches of tropical tunas in the EPO are caught by purse seiners (IATTC, 2022b).

Resolution C-21-04 sets fishery-specific management measures for both purse seine and longline fleets. In the case of the longline fleets catch limits are set for the main fishing CPCs (China, Japan, Korea, Taiwan, EEUU), while all the other CPCs shall limit their catches to a maximum of 500t or their respective catches of bigeye tuna in 2001 (these catch limits applicable to the longline fleet were set for the first time in 2017 through Res 17-02). Each CPC shall submit to the IATTC a national report on its updated national compliance scheme and actions taken to implement the measures included in the Resolution, including any controls it has imposed on its fleets and any monitoring, control, and compliance measures it has established to ensure compliance with such controls. This Resolution was later amended by C-22-05.

Besides, the use of the Bigeye Tuna Statistical Document is recommended to all CPCs exporting or importing bigeye tuna. The statistical Document Program is a tool to assist the Commission fighting against the IUU fishing.

Based, on the above, the team considers that SG60 and SG80 are met.

However, as recognized by the IATTC (e.g. C-21-04, paragraph 44) shall continue efforts to develop harvest strategies for tropical tunas. The IATTC scientific staff is commissioned by the Commission to develop a Management Strategy



Evaluation, to advise the Commission on initial candidate harvest strategies, starting with bigeye tuna. A candidate harvest strategy for bigeye tuna, including candidate management actions to be taken under various stock conditions, shall be presented to the Commission by 2024. Until this objective is achieved for the 3 tropical tunas, **SG100 is not met.**

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

The volume of tropical tunas caught by the UoA is almost negligible compared to the total catches in the EPO.

The partial harvest strategy is implemented by restricting the fishing effort of the entire purse seine fishery for yellowfin, bigeye and skipjack. Since this fishery is responsible for over 90% of the tropical tuna catches in the EPO it is considered likely to work. **SG60 is met.**

Resolution C-16-02 provides a decision-making framework based precautionary reference points. The quality of the stock assessments, risk analysis of different and continuous monitoring of fishery indicators performed by the scientific staff of the IATTC and peer-reviewed by the SAC provides objective basis for confidence that the partial strategy will work. **SG80 is met.**

However, the bigeye tuna is overfished and subject to overfishing, while yellowfin tuna might be subject to overfishing. According to Aires et al (2020b), the bimodality complicated the evaluation of the status of the bigeye stock and of the potential outcomes of management actions. However, at the light of this uncertainty, no precautionary actions were taken by the Commission for the bigeye **SG100 is not met.**

	Management	strategy implementation		
с	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	Met?		Yes	Yes
Ration	ale			

As far as the team is aware the national regulations affecting the fishery and affecting primary species (authorized hooks, closed season, closed census) are being implemented successfully, and bycatches of non-target species are kept are low levels when using LL-DOL.

UoA catches of each of the tropical tuna species are almost negligible at EPO stock level, and they are definitely below the bigeye 500t/year catch limit imposed to the Ecuadorian longline fleet through C-21-04. Thus, **SG60 and SG80 are met.**

However, there might be an issue of non-compliance with the bigeye tuna catch limit in Ecuador when the catches of the LL-TBS are included. However, the P-2 issues are only related to the UoA, and LL-TBS is not included in the UoA. Thus, the team decided to assess this issue under PI 3.2.3(d).



	Shark finning				
d	Guide post	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.	
	Met?	NA	NA	NA	
Rationa	ale				

There are shark species among the primary components impacted by the UoA (see **table 7.3.1.6**). Thus, **this SI is not applicable**.

	Review of alternative measures				
e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of main primary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.	
	Met?	NA	NA	NA	
Rationale					

The only primary species caught by the UoA are tropical tunas. These are highly valuable species which are caught in low volumes. There is no incentive for discarding and, as far as the team is aware, there are no discards. Thus, **this SI is not applicable.**

References

Aires et al, 2020b Ecuadorian Executive Decree 362/2022 IATTC, 2022b

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

Draft scoring range	≥80	
Information gap indicator	 More information sought: Check the possibility that the Ecuadorian LL fleet had overaged the catch limit for bigeye tuna in 2020. 	

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.1.3 – Primary species information

PI 2	2.1.3	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species				
Scoring Issue		SG 60	SG 80	SG 100		
	Informat	ation adequacy for assessment of impact on main primary species				
а	Guide	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status. OR	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.		
	post	If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.			
	Met?	Yes	Yes	Yes		
Rationale						

The skippers have the obligation to record all catches in their logbooks. All landings shall be inspected by inspectors to get the Certificate of Monitoring and Control of Fisheries Landing (CMCDP). All potential primary species impacted by the UoA would have commercial value and there is no incentive for underreporting or discarding at sea. Thus, the team considers that the available data sources are adequate to assess with a high degree of certainty that the UoA is not impacting on any main primary component. **SG60, SG80 and SG100 are met.**

	Information adequacy for assessment of impact on minor primary species			
b	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			Yes
Ration	ale			

The skippers have the obligation to record all catches in their logbooks. All landings shall be inspected by inspectors to get the Certificate of Monitoring and Control of Fisheries Landing (CMCDP). The only minor primary species impacted by the UoA are highly valuable tuna species, which are caught at low volumes when using the LL-DOL. There is no incentive for underreporting or discarding at sea. **SG100 is met.**

	Information adequacy for management strategy			
С	Guide post	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main primary species.	Information is adequate to support a strategy to manage all primary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.


	Met?	Yes	Yes	Yes
Rationa	ale			

As explained in SI(a), the team considers that the available data sources are adequate to assess with a high degree of certainty that the UoA is not impacting on any main primary component. Thus, **SG60 and SG80 are met.**

The only minor primary species are the 3 tropical tunas. UoA's landings confirm that only low volumes of these species are caught using LL-DOL. **SG100 is met.**

References

The CAB shall list any references here, including hyperlinks to publicly-available documents.

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

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

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.2.1 - Secondary species outcome

PI 2	2.2.1 The UoA aims to maintain secondary species above a biologically based limit and doe not hinder recovery of secondary species if they are below a biological based limit			
Scoring Issue SG 60		SG 60	SG 80	SG 100
	Main se	condary species stock statu	S	
		Main secondary species are likely to be above biologically based limits.	Main secondary species are highly likely to be above biologically based limits.	There is a high degree of certainty that main secondary species are above biologically based limits.
а	Guide post	If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	Blue shark: Yes Pelagic thresher shark: Yes Pacific blue marlin: Yes South EPO swordfish: Yes Flying jumbo squid: Yes	Blue shark: No Pelagic thresher shark: No Pacific blue marlin: Yes South EPO swordfish: Yes Flying jumbo squid: Yes	Blue shark: No Pelagic thresher shark: No Pacific blue marlin: Yes South EPO swordfish: No Flying jumbo squid: Yes
Ration	ale			

Only 4 species/stocks impacted by the UoA are above the threshold to be considered 'main' secondary components: blue shark, pelagic thresher shark, Pacific blue marlin, and South EPO swordfish. Besides, since no more detailed information has been provided at this stage (ACDR) in relation to volumes used for each of the bait species used, the team decided to take a precautionary approach and classified the preferred bait used, flying jumbo squid, as a main species. All the remaining secondary species were classified as 'minor' components for the purpose of this assessment, including the other bait species.

There are biologically based limits available for all 4 main primary stocks, derived either from analytical stock assessments (Pacific blue marlin and South EPO swordfish) or using empirical approaches such as ecological risk assessments (blue shark and pelagic thresher shark). So, these stocks are assessed using the Standard Assessment Tree (Annex SA, FCP).

See section 7.3.1.1 for details on the data sources used and the classification of the P2-species scoring elements.

Blue shark (*Prionace glauca*) & Pelagic thresher shark (*Alopias pelagicus*)

Due to the common paucity of catch and biological data available for the majority of shark bycatch species caught in EPO pelagic fisheries an ecological risk assessment (ERA) approach, Ecological Assessment for the Sustainable Impacts of Fisheries (EASI-Fish), was used by Griffths et al (2022) to quantify the vulnerability of bycatch 32 species to



the cumulative impacts of multiple fisheries in the EPO. Estimates of a proxy for fishing mortality (F_{2019}) and the spawning stock biomass per recruit (SBR₂₀₁₉) in 2019 exceeded biological reference points ($F_{40\%}$ and SBR_{40%}) for 20 species, classifying them as "most vulnerable", including blue shark and pelagic thresher shark. $F_{40\%}$ is the F value corresponding to 40% of the spawning potential ratio (SPR), which is the SBR at the F2019 value divided by the SBR if F=0. The corresponding SBR_{40%} BRP is the SBR value at $F_{40\%}$. In the case of the blue shark $F_{2019}/F_{40\%} = 4,526$ (±1,623), while SBR₂₀₁₉/SBR_{40%} = 0,111 (±0,134); and for the pelagic thresher shark $F_{2019}/F_{40\%} = 1,903$ (±0,084), while SBR₂₀₁₉/SBR_{40%} = 0,446 (±0,037). See **table Pl2.1.1.1** in SI(b) below for a summary on the results of this study.

Based on the above, it cannot be considered that any of these two shark species are likely to be above biologically based limits. Then, the team shall assess if there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.

The measures in place are detailed and assessed in PI 2.2.2(a), and landing data show that the measures listed above ensure that the UoA maintains the level of bycatches of all non-targeted species at low levels, including catches of blue shark and pelagic shark. Data presented in table 7.3.1.3 show that UoA average annual catches between 2013 and 2021 of these two species are around 202 t (for each of them), ranging from 1t up to 461t in the case of blue shark and 1260t in the case of pelagic thresher shark, in both cases the peak was reached in 2016. On average each of these shark species accounted for 4% of the total volume landed by the UoA between 2013 and 2021.

Both are commercial species with considerable commercial value and on which there is no catch limitation, so there are no incentives for under-reporting or for them to be discarded on the high seas.

Based on the above, the team considers that that the assessed fishery meets the second part of the rationale for SG60. Thus, **SG60 is met.**

Since the status of the assessed stocks are not above their biological limits, the team shall assess the second part of the rationale for SG80.

The proxy for fishing mortality estimated by Griffith et al (2022) was found to exceed its biological reference for the two shark species assessed here, indicating that there is no evidence of recovery for any of the 2 shark species evaluated here.

Sharks are long-lived and low fecundity species, and species with such characteristics are extremely vulnerable and even a selective fishery that captures a few individuals may cause serious effects on their populations' viability (Lewison et al 2004). Thus, to consider that there is a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding it would be essential to be able to correctly estimate the magnitude of the interactions. However, this is not possible due to the low observer coverage and lack of information on the post-capture survival rates, as discussed in PI 2.2.2(b).

Thus, SG80 is not met.

Pacific blue marlin (Makaira nigricans)

The best information currently available indicates that blue marlin constitutes a single world-wide species (Makaira nigricans) and a single stock in the Pacific Ocean. For this reason, statistics on catches are compiled, and analyses of stock status are made, for the entire Pacific Ocean (IATTC, 2022).

The most recent full assessment of the status and trends of the species was conducted in 2021, which included data through 2019 (IATTC, 2022). It indicated that blue marlin in the Pacific Ocean currently has a stock biomass that is 17% above SSB_{MSY} , while fishing mortality is 50% of F_{MSY} , and is therefore neither overfished nor subject to overfishing.

Besides, the UoA catches are almost negligible in recent years. The maximum annual catches peaked to 362,5 in 2018, but they were below 1 t since 2019.

There are no other overlapping MSC—certified fisheries assessing this species as a main secondary species, so no cumulative impacts have to be considered for scoring SG80.

Based on the above, SG60 and SG80 are met.

Over the past seven years (2014–2020), however, annual catches increased in the EPO, averaging 3,994 t, indicating that catches may currently be in the vicinity of MSY (IATTC, 2022).



Despite current catches are close to MSY, the team considers that there is a high degree of certainty (>80%ile) that the stock is above PRI. **SG100 is met.**

South Pacific swordfish (Xiphias gladius)

Swordfish (Xiphias gladius) occur throughout the Pacific Ocean (PO) between about 50°N and 50°S. There is strong evidence that swordfish in the Pacific comprise multiple stocks. As many as six stocks may exist in the Pacific Ocean, but the exact boundaries of these stocks, as well as their exchange rates—for the purposes of stock assessment—is currently uncertain (IATTC, 2022). Following the uncertainty in stock structure, three hypotheses for stock structure were considered in the most recent assessment with data up to 2019 (Minte-Vera et al. 2022):

- H1: The stock is distributed south of 5°S and east of 150°W, as it was assumed in the previous assessment performed in 2011.
- H2: The stock is distributed south of 10°N and east of 150°W. This hypothesis was considered as the reference case.
- H3: The stock is distributed south of 10°N and east of 170°W.

Reference points for swordfish are yet to be chosen by the IATTC. However, for comparison purposes Minte-Veral (2022) chose both the equilibrium reference points used by the IATTC for tropical tunas (C-16-02, see PI 2.1.1 for more details), and dynamic reference points based on the WCPFC ones. The WCPFC adopted a dynamic biomass limit reference point for all stocks under their jurisdiction of 20% of the unfished biomass (20%SSB_F=0 when time t is equal current time). The unfished biomass is defined as what the current biomass would be without fishing, thus considers the estimated variability in recruitment. For target reference points, two values are computed 40% SSB_F=0(t) and 50% SSB_F=0(t).

Results from Minte-Vera et al (2022) showed that all models are above the limit reference irrespective of which one was used: the equilibrium point for tropical tunas ($S_{0.5R0}$), or the dynamic reference point of 20% unfished biomass. Results also showed that the stock is approaching the target reference point of 40% unfished biomass.

Besides, average annual catches for the period 2013-2022 are low: 90t, with a peak of 362t in 2018.

There are no other overlapping MSC—certified fisheries assessing this species as a main secondary species, so no cumulative impacts have to be considered for scoring SG80.

Based on the information above, the team considers that SG60 and SG80 are met.

However, the uncertainty in the assessment (different models and different hypotheses tested), together with the fact that some models showed that both the biomass and the fishing intensity target reference points have been breached, leads the team to consider that **SG100 is not met.**

Flying jumbo squid (Dosidicus gigas)

The flying jumbo squid fishery is the largest invertebrate fishery in the world and one of the largest of the world even when including finfish fisheries. In the South East Pacific Ocean (SEP) it is fished in four regions: Ecuadorian, Peruvian and Chilean exclusive economic zones (EEZ), and international waters off those EEZs (Roa-Ureta and Wiff, 2022). According to Roa-Ureta and Wiff (2022), a stock assessment database was built to apply multi-annual depletion models combined with surplus production models from monthly catches and fishing effort of the Asian fleets, and monthly catches, fishing effort and mean fish weight of squids in the catch by Chilean fleets, spanning January 2011 to December 2021. The stock assessment took into account environmental cycles in the SEP with models having time-varying parameters. A hierarchical statistical inference framework connected biomass predictions of multi-annual depletion models with the surplus production model, which took the Pella-Tomlinson form. Results from Roa-Ureta and Wiff (2022) indicate that the biomass dynamics of the stock in the region is driven by environmental cycles connected to the ENSO, leading to changes in the carrying capacity of the environment, the symmetry of the production function, and the intrinsic rate of population growth. The largest change occurs in the intrinsic rate of population growth, which increases 62% during the ENSO period. During warm, ENSO years the stock has higher sustainable harvest rates and wider fluctuations than during normal, cold water periods. The low end of these biomass fluctuations are cause of concern for the sustainability of the fishery.

Actual harvest rates during warm, ENSO years as well during cold, normal periods, have been well below the sustainable harvest rates of each period. According to Roa Ureta and Wiff (2022), this result combined with high escapement biomass at the end of the last season in the time series (2020) indicates that the stock is not over-fished and not undergoing over-fishing.



There are no other overlapping MSC—certified fisheries assessing this species as a main secondary species, so no cumulative impacts have to be considered for scoring SG80.

Based on the above, SG60 and SG80 are met.

However, at this stage there is no information on the volume of squid consumed by the UoA. Also, Roa-Ureta and Wiff (2022) acknowledge that Results from this stock assessment methodology can be improved substantially by a collaborative effort with Chinese, Peruvian and Ecuadorian experts to compile a more complete database of monthly catch, fishing effort and mean weight. **SG100 is not met.**

b	Minor se	econdary species stock status
		Minor secondary species are highly likely to be above biologically based limits.
	Guide	OR
	post	If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?	Striped marlin: Yes Shark species (14 spp.): No Ray species (2 spp.) & bony fish (13 spp.): RBF needed but PF5.3.2.1 invoked
Ration	ale	

A total of 27 minor secondary species were found to be impacted by the UoA (see **table 7.3.1.6**). This list includes 9 bony fish species, 16 shark species and 2 ray species.

There are biologically based limits available for 17 of these species, derived either from analytical stock assessment (stripped marlin) or using empirical approaches such as ecological risk assessments (all 16 shark species). So, these stocks are assessed using the Standard Assessment Tree (Annex SA, FCP). However, for the remaining 9 components (Pompano dolphinfish, wahoo, black skipjack, striped bonito, black marlin, Indo-Pacific sailfish, short bill spearfish, escolar, pelagic stingray, longtail stingray.) there are no reference points available, so they are considered as Data Deficient (DD) (FCP7.7.3).

EPO Striped marlin (Kajikia audax)

The assessment on which IATTC (2022) is based is for the stock of striped marlin in the eastern Pacific Ocean (EPO) north of 10°S, east of about 145°W north of the equator, and east of about 165°W south of the equator. Although not included in the assessment model, there may be limited exchange of fish between this stock and stocks in adjacent regions, since this species occur throughout the Pacific Ocean between about 45°N and 45°S.

The last full assessment of striped marlin was conducted in 2008, using Stock Synthesis, and later updated with data through October 2010 (IATCC, 2022). Key results were that (1) the stock was not overfished; (2) overfishing was not occurring; and (3) the spawning stock biomass was above the level that would support MSY. More recently, average annual catches during 2016–2020 (1,735 t) were at about half the estimated MSY level in 2010. If fishing effort and catches continue at the 2010 level (2,129 t), it is expected that the biomass of the stock will continue to increase over the near term(IATTC, 2022). The fishing effort by large longline vessels in the North EPO has increased by about 20% since 2010, but the catch of striped marlin has remained largely unchanged (IATTC, 2022). According to IATTC (2022), efforts continue to obtain reliable catch data from all fisheries. Until the data are available and updated, and a review of the status of striped marlin in the EPO is completed, the IATTC recommends that, as a precautionary measure, fishing effort by fisheries that take the majority of the striped marlin catch in the EPO not be increased. Average annual catches for the period 2013-2022, with a peak to 133t in 2016. **SG100 is met.**

Shark species (14 species)





A total of 14 shark species were identified as being impacted by the UoA and classified as minor secondary species. The list is as follows: Bigeye thresher shark (*Alopias superciliosus*), Thresher shark (*A. vulpinus*), Galapagos shark (*Carcharhinus galapagensis*), bull shark (*C.leuca*), blacktip shark (*C.limbatus*), dusky shark (*C.obscurus*), tiger shark (*Galeocerdo cuvier*), whitenose shark (*Nasolamia velox*), lemon shark (*Negaprion brevirostris*), shortfin mako shark (*Isurus oxynrinchus*), longfin mako shark (*Isurus paucus*), bigeye sand tiger shark (*Odontaspis noronhai*), Crocodile shark (*Pseudocarcharias kamoharai*), Tope shark (*Galeorhinus galeus*). These 16 species will be score as a single scoring element.

As explained in SI(a), Griffth et al (2022) quantified the vulnerability of bycatch 32 species to the cumulative impacts of multiple fisheries in the EPO. Estimates of a proxy for fishing mortality (F₂₀₁₉) and the spawning stock biomass per recruit (SBR₂₀₁₉) in 2019 exceeded biological reference points (F_{40%} and SBR_{40%}) for 20 species, classifying them as "most vulnerable", including bigeye thresher shark (*Alopias superciliosus*), bull shark (*C.leuca*), blacktip shark (*C.limbatus*), whitenose shark (*Nasolamia velox*), lemon shark (*Negaprion brevirostris*), shortfin mako shark (*Isurus oxynrinchus*), bigeye sand tiger shark (*Odontaspis noronhai*), Crocodile shark (*Pseudocarcharias kamoharai*), Tope shark (*Galeorhinus galeus*). Three species were classified as 'increasingly vulnerable', and the 3 of them are among the species assessed here: thresher shark (*A. vulpinus*), tiger shark (*Galeocerdo cuvier*), Galapagos shark (*Carcharhinus galapagensis*), dusky shark (*C.obscurus*). Finally, 9 species were classified among the 'least vulnerable', but only 1 of them is among the assessed species: longfin mako shark (*Isurus paucus*).

Based on the above, only 1 shark species (longfin marko shark) out of the 16 species assessed here can be considered to be likely above its biologically based limits. Thus, the team considers that the first part of the rationale for SG60 is not met by the minor secondary shark species impacted by the UoA.

Threfore, the team shall assess if there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species.

The proxy for fishing mortality estimated by Griffith et al (2022) was found to exceed its biological reference for 13 out of the 14 species assessed here.

Sharks are long-lived and low fecundity species, and species with such characteristics are extremely vulnerable and even a selective fishery that captures a few individuals may cause serious effects on their populations' viability (Lewison et al 2004). To consider that there is evidence that the UoA does not hinder recovery and rebuilding it would be essential to be able to correctly estimate the magnitude of the interactions. However, this is not possible due to the low observer coverage and lack of information on the post-capture survival rates, as discussed in PI 2.2.2(b).

Thus, SG100 is not met.

 Table PI2.2.1.1. Estimated mean (+/- standard deviation) values for proxy fishing mortality (F2019), spawning stock biomass-per-recruit (SBR2019), and biological reference points (F40% and SBR40%) for 32 shark species in 2019 caught in pelagic fisheries of the eastern Pacific Ocean. Red, orange and green colors indicate scenarios where the stock was classified as "most vulnerable", "increasingly vulnerable" or "least vulnerable", respectively. Source: Griffith et al, 2022. Table 6.



Code	Species	F ₂₀₁₉ /F _{40%}	F ₂₀₁₉ /F _{40%} Std Dev	SBR ₂₀₁₉ /SBR _{40%}	SBR ₂₀₁₉ /SBR _{40%} Std Dev
ALV	Alopias vulpinus	0.924	0.355	1.126	0.262
BRO	Carcharhinus brachyurus	1.356	0.396	0.782	0.262
BSH	Prionace glauca	4.526	1.623	0.111	0.134
BTH	Alopias superciliosus	6.404	2.526	0.030	0.036
CCA	Carcharhinus altimus	4.173	1.014	0.199	0.084
CCE	Carcharhinus leucas	4.284	1.006	0.073	0.066
CCG	Carcharhinus galapagensis	0.615	0.131	1.366	0.146
CCL	Carcharhinus limbatus	5.911	0.520	0.012	0.007
CCP	Carcharhinus plumbeus	2.980	0.508	0.409	0.075
CCR	Carcharhinus porosus	6.814	2.616	0.189	0.094
CNX	Nasolamia velox	1.559	0.339	0.737	0.147
DUS	Carcharhinus obscurus	0.610	0.133	1.431	0.167
FAL	Carcharhinus falciformis	7.447	0.477	0.002	0.001
ISB	Isistius brasiliensis	0.021	0.020	2.171	0.381
LMA	Isurus paucus	1.104	0.858	1.142	0.533
LMD	Lamna ditropis	0.264	0.154	2.026	0.262
OCS	Carcharhinus longimanus	1.706	0.427	0.581	0.229
POR	Lamna nasus	0.102	0.051	2.260	0.121
PSK	Pseudocarcharias kamoharai	1.529	0.159	0.648	0.089
PTH	Alopias pelagicus	1.903	0.084	0.446	0.037
RHN	Rhincodon typus	0.738	0.694	1.510	0.684
RHU	Rhizoprionodon longurio	3.504	0.380	0.161	0.039
SCK	Dalatias licha	2.411	3.670	1.083	0.734
SMA	Isurus oxyrinchus	6.254	1.468	0.019	0.029
SPE	Sphyrna media	6.648	0.422	0.083	0.011
SPK	Sphyrna mokarran	3.192	0.649	0.163	0.099
SPL	Sphyrna lewini	7.196	0.821	0.006	0.003
SPZ	Sphyrna zygaena	7.808	0.382	0.002	0.001
SSN	Sphyrna corona	4.470	0.794	0.084	0.046
SSQ	Zameus squamulosus	1.512	2.147	1.235	0.622
TIG	Galeocerdo cuvier	0.708	0.624	1.511	0.606
WSH	Carcharodon carcharias	0.070	0.032	2.337	0.076

Data deficient species: Bony fish (10 species) and ray species (2 species)

There are no biologically based limits established and the status remain unknown for the following species: Pompano dolphinfish (*Coryphaena equiselis*), wahoo (*Acanthocybium solandri*), black skipjack (*Euthynnus lineatus*), striped bonito (*Sarda orientalis*), black marlin (*Istiompax indica*), Indo-Pacific sailfish (*Istiophorus platypterus*), short bill spearfish (*Tetrapturus angustirostris*), escolar (*Lepidocybium flavobrunneum*), Pacific thread herring (Opisthonema spp.), bigeye scad (Selar crumenophthalmus), frigate tuna (Auxis spp), chub mackerel (*Scomber japonicus*).

pelagic stingray (*Hypanus longus*), longtail stingray (*Pteroplatytrygon violacea*). Therefore, they are all classified as Data Deficient species according to FCR7.7.6, and RBF shall be triggered for assessing their status against this SI.

However, PF4.1.4 allows the team to avoid conducting RBF on 'minor' species when evaluating PI2.1.1 or 2.2.1 as far as final PI score is adjusted downward according to clause PF5.3.2. Due to the high number of different species to be assessed as minor secondary species the assessment team decided to take this option. Therefore, **in accordance with PF5.3.2.1 the final PI score shall not be greater than 80.**

References

Griffith et al., 2022 IATTC, 2022 Minte-Vera et al., 2022 Roa-Ureta and Wiff, 2022

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

Draft scoring range	60-79
Information gap indicator	More information sought:

Quantitative information of the volume of each of the bait used is **KEY** to proceed with the assessment of the bait species as required by the MSC Standard

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.2.2 – Secondary species management strategy

PI 2	2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch				
Scoring Issue		SG 60	SG 80	SG 100		
	Manage	ment strategy in place				
а	Guide post	There are measures in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a partial strategy in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a strategy in place for the UoA for managing main and minor secondary species.		
	Met?	Bait main species (1sp): Yes All other main species (4spp): Yes	Bait main species (1sp): No All other main species (4 spp): Yes	Bait species (5 spp) : No All other species (30 spp): No		
Rationale						

This SI deals only with measures or strategies in place to manage main secondary species. The main secondary species impacted by the UoA are blue shark, pelagic thresher shark, blue marlin, South EPO swordfish, and flying jumbo squid (as bait species).

Bait species

The only main bait species considered in the assessment is the flying jumbo squid.

Ecuador is member of the SPRFMO, and this RMFO issued in 2020 a Conservation and Management Measure (CMM) on the Management of the Jumbo flying squid (CMM 18-2020). This CMM states that only vessels duly authorized shall participate in the fishery for jumbo squid, and sets some data collection and reporting requirements to improve the knowledge of the fishing effort on this species, and also sets monitoring and control requirements (including observer coverage). Authorised vessels shall be included in the Record of Vessels Authorised to Fish in the Convention Area.

At the national level, Article 225 of the Executive Decree 362 passed in February 2022 states that fishing operations and catches shall be recorded, so fishing operations for bait species and their catches should be recorded. During the preparation of the ACDR, the SRP sent a communication to the team stating that there is a specific field in the logbook to record the bait used. No other national regulations to manage the use of bait species in this fishery.

Based on the above, the team considers that SG60 is met.

At the international level, the SPRFMO has recently demonstrated its capacity to perform a stock assessment for this stock. However, at the national level there is no evidence that there is the capacity to monitor the catches of flying jumbo squid, and the stock assessment report (Roa and Wiff, 2022) acknowledges that Ecuadorian catch data were not included in the assessment because of data shortage and deficiencies.

MSC defines "partial strategy" as "a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. (...)" (Table SA8, MSC-Fisheries Standard v2.01). The lack of measures at national level, together with the lack of quantitative data on the volume of flying jumbo squid caught by this fishery prevent the team to consider that a partial strategy, as defined by the MSC, is in place at the national level. **SG80 is not met.**

All other species (30spp.)

SG60 and SG80 deal only with main species, which in this case are: blue shark, pelagic thresher shark, blue marlin and swordfish.

At the national level, general management measures affecting all non-target species caught by the UoA are the technical gear specifications, dolphinfish closed season (which means that the fleet changes its gear from LL-DOL to LL-TBS to target tunas, billfishes and sharks), closed census, data reporting obligations (mandatory logbooks, and Article 225 of the Ex.Decree 362/2022 states that all interactions shall be recorded), observer program in place, and inspections at port to obtain the landing certificate.

Article 225 of the Executive Decree 362 passed in February 2022 states that all catches and incidental interactions shall be recorded.

On top of that, shark lines (individual lines attached to the floatline or to the floats directly and used to target sharks) are prohibited both at international level (through IATTC C-16-05), and at national level (Executive Decree N°5486/2007). Also, the use of steel leaders is prohibited at national level since 2007 (Executive Decree N°5486/2007). Shark finning is prohibited both at international and national level, see PI 2.2.2(d) for more details on this topic.

Ecuador developed its first National Action Plan for sharks' management and conservation (PAN-EC) in 2013, valid for a period of 5 years. This PAN-EC was adopted as a national policy through Executive Decree Nº486/2007. A new PAT-EC was developed for the period 2020-2024, and it has also been adopted as National policy through Agreement MPCEIP-SRP 2022-0068-A.

The IATTC Resolution-19-08 states that each CPC shall ensure that at least 5% of the fishing effort made by its longline fishing vessels greater than 20m length carries a scientific observer. Besides, current national regulations oblige to comply with a minimum observer coverage of 10% of the fishing trips performed by the mothership vessels, and to increase it progressively up to 20% in 2024. Observers' data are reported to the SRP.

At the IATT level, a new Permanent Working Group on Ecosystem and Bycatch (EBWG) was formally created in 2022 through the adoption of Resolution C-22-06, and its first meeting is expected for May 2023. Among the objectives of this WG is to evaluate and recommend measures and best practices to avoid, reduce and minimize catch and mortality of non-target species, effective methods for safe handling practices and release of non-target species, and the effects of fishing on endangered species. This permanent WG replaces the previous WG on Bycatch (BYC) which had been meeting regularly in recent years.

The IATTC performs analytical stock assessments for the blue marlin and swordfish (sometimes in collaboration with other RFMOs), and also a comprehensive risk assessment for 32 shark species, including the blue shark and the pelagic thresher shark.

Based on the above, the team considers that there is a strategy in place for managing main species. Thus, **SG60 are SG80 are met.**

Landing data shows that the measures listed above ensure that the UoA (which includes only LL-DOL) maintains the level of bycatches of all non-targeted species at low levels, including sharks. However, the team considers that there is no strategy in place for managing all 30 main and minor species impacted by the UoA. **SG100 is not met.**

Management strategy evaluation				
	The measures are considered	There is some objective	Testing	
	likely to work, based on	basis for confidence that the	confidence	
Guide	plausible argument (e.g.	measures/nartial strategy will	strategy/stra	

-	post	general experience, theory or comparison with similar UoAs/species).	work, based on some information directly about the UoA and/or species involved.	based on information directly about the UoA and/or species involved.
	Met?	All other species (30 spp): Yes	All other species (30 spp): No	All other species (30 spp): No

Rationale

Bait species:

At this stage the team does not have evidence that catches of jumbo flying squid are being recorded in this fishery. Only qualitative information on the bait used could be gathered for the preparation of the ACDR. The stock assessment could not include catch data from Ecuador (Roa and Wiff, 2022).

The team considers that there is no ground to consider that current measures are likely to work. SG60 is not met.

high

supports

All other species

The partial strategy described in SI(a) is considered likely to work since the fishing gear used (LL-DOL) has low levels of bycatches. **SG60 is met.**

However, the fishery still impacts on several shark species are not in a good condition, as shown in Griffiths et al. (2022). A recent assessment of the vulnerability of sharks caught in pelagic fisheries in the Eastern Pacific Ocean (Griffiths et al, 2022) classified all shark species listed in **table 7.3.1.5** (with the exception of the longfin mako shark *-l.paucus-*) as 'most vulnerable' or 'increasingly vulnerable'. This study states that for species listed as "most vulnerable" and 'increasingly vulnerable', significant research and/or monitoring efforts are required to fill crucial biological and/or ecological data gaps and to improve distribution information in order to optimize species distribution models, or to develop management measures to reduce the potential for populations of some particularly sensitive species to further decline or even extinction due to their restricted endemic distributions in the EPO.

In the preamble of C-19-08 it is acknowledged that the IATTC scientific staff and the IATTC Working Group on Bycatch have repeatedly recommended at least 20% observer coverage on longline vessels fishing for tunas in the Convention Area, and also that the Scientific Advisory Committee (SAC) determined that the appropriate measure of longline fishing effort for calculating observer coverage is "number of hooks." As discussed in previous subsections, despite the observer coverage in Ecuador thought to be around 9% of the fishing trips performed by the mothership vessels, the actual coverage in number of hooks is likely to be below 1%, compromising the representativeness of the of the observations, especially in the case of species with very low interaction frequencies, as would be the case of the protected shark species listed in **table 7.3.1.6.** Besides, data on post-capture survival rates were not provided.

Thus, the team considers at this stage **SG80 is not met.**

	Management strategy implementation				
с	Guide post	There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).		
	Met?	Bait species (5 spp): No All other species (30 spp): Yes	Bait species (5 spp): No All other species (30 spp): No		
Ration	ale				

Bait species (5 spp):

At this stage the team could not have evidence that catches of jumbo flying squid are being recorded in this fishery. Only qualitative information on the bait used could be gathered for the preparation of the ACDR. An the stock assessment could not include catch data from Ecuador (Roa and Wiff, 2022). The team considers that there is no ground to consider that current measures are likely to work. **SG60 is not met.**

All other species (30 spp)

At the national level there is evidence that the observer program is being implemented and that the inspections at ports are informing national catch statistics. As far as the team is aware, the shark-specific measures (no shark lines or steel leaders) are implemented by the fleet. **SG80 is met.**

However, the low observer coverage, and the lack of information in relation to the frequency of inspections performed and infringements identified are preventing the team to consider that there are clear evidence of successful implementation. Besides, the lack of information on the fate (alive/dead) of the recorded interactions limits the ability to assess whether the partial strategy is achieving its objectives. Thus, **SG100 is not met.** Also, at this stage it is not clear if, in the case of sharks, the obligation to record incidental interactions in the logbook (Article 225, Ex-.Dec 362/2022) is being accomplished. This issue shall be further investigated during the site visit.

d Shark finning

Guide	It is likely that shark finning is	It is highly likely that shark	There is a high degree of
Guide	not taking place.	finning is not taking place.	certainty that shark finning is
posi			not taking place.

	Met?	Yes	Yes	Νο
Ration	ale			

This issue is applicable to the UoA, since there are 16 shark species identified as secondary components, 2 of them classified as 'main', and the other 14 as 'minor'.

Shark finning is prohibited both at international and national level.

Resolution C-05-03 adopted by the IATTC in 2005 sets the following:

- CPCs shall take the measures necessary to require that their fishers fully utilize any retained catches of sharks. Full utilization is defined as retention by the fishing vessel of all parts of the shark excepting head, guts, and skins, to the point of first landing.
- CPCs shall require their vessels to have onboard fins that total no more than 5% of the weight of sharks onboard, up to the first point of landing. CPCs that currently do not require fins and carcasses to be offloaded together at the point of first landing shall take the necessary measures to ensure compliance with the 5% ratio through certification, monitoring by an observer, or other appropriate measures.
- The ratio of fin-to-body weight of sharks described in paragraph 4 shall be reviewed by the Working Group on Stock Assessment and reported back to the Commission in 2006 for revision, if necessary.
- Fishing vessels are prohibited from retaining on board, transshipping, landing or trading in any fins harvested in contravention of this Resolution.
- Each CPC shall annually report data for catches, effort by gear type, landing and trade of sharks by species, where possible, in accordance with IATTC reporting procedures, including available historical data. CPCs shall send to the IATTC Secretariat, by May 1, at the latest, a comprehensive annual report of the implementation of this Resolution during the previous year

At national level, the Executive Decree 486 passed in 2007 set the following:

<u>Art. 7</u>.- Only the landing of whole sharks caught as bycatch by authorised fishing vessels will be allowed. The removal of the fins can only be carried out on land. If on board the fishing vessels shark fins are found without their respective bodies, or separated from the sharks' bodies, fins will be confiscated, and the corresponding legal actions will be initiated against the captain and owner of the vessel. In case of recidivism, the fishing authority will definitively suspend the fishing permit of the vessel and it may not be used for fishing or related activities.

<u>Art. 8</u>.- Shark fins that are confiscated will not be subject to donation, sale, auction, nor can they be exported. These fins will be guarded by the competent authority of the jurisdiction where they have been seized. (...) Subsequently, and after complying with the legal procedures, the confiscated fins will be incinerated, which will be done by the Undersecretary of Fisheries Resources of the Ministry of Agriculture, Livestock, Aquaculture and Fisheries, with prior notification to the Undersecretary of Management. Environmental Coastal Ministry of the Environment.

<u>Art. 10</u>.- The importation and maritime transhipment of whole sharks or shark fins in any state of conservation or processing, even when they have been captured in international waters, is prohibited.

Traceability begins with the observers on board the fishing vessels. Current national regulations oblige to comply with a minimum observer coverage of 10% of the fishing trips performed by the mothership vessels, and to increase it progressively up to 20% in 2024. According to data reviewed by the team during the preparation of the ACDR, an average of 9% observer coverage has been implemented in recent years (despite the constrains imposed by the pandemic situation).

The Vice Ministry of Aquaculture and Fisheries, through the Undersecretariat of Fisheries Resources, has a permanent monitoring system, currently carried out by 273 fisheries inspectors at the national level, assigned to the different ports, recording the target catch, incidental catch, catch volumes and other data of interest such as vessel data, departure and arrival dates, description of the fishing gear, and other information contained in the Fisheries Landing Monitoring and Control Certificate (CMCDP). In the specific case of shark species, the inspectors are checking that only whole sharks are offloaded, with their respective fins attached to the body. Only after this check, the CMCDP is issued, and this is the enabling document for the issuance of the Shark Bycatch Mobilization (GMPIT). The Monitoring Certificate and the Mobilization Guide are mandatory documents to transport and market the product internally or externally.

During 2015, a virtual platform called the Ecuadorian Single Window (VUE) was implemented, one of the modules of the web portal of the Ecuadorian customs system; called ECUAPASS, where the external user enters the processing request for the export of dry shark fins in order to obtain the "Export Authorization for Fishery Products subject to restrictions: sharks". In 2017, export requests for frozen bodies with and without fins were incorporated, and finally, in 2021, fresh refrigerated shark export procedures were added.



Based on the above, the team considers that SG60 is met.

Despite, at this current stage the observer coverage is below 20%, which is the level of external minimum required by the MSC to score 80. It is important to consider that the Executive Decree 486/2007 is a policy requiring the landing of all sharks with fins naturally attached, no ratios are allowed. The MSC recognizes that this type of policy are the most rigorous approach to ensuring that shark finning is not occurring (GSA2.4.5-2.4.7), and the Executive Decree 486/2007 is fulfilling that requirement. As far as the team is aware, Ecuador is complying with data reporting requirements detailed in C-05-03, and there are no issues on this topic. The team considers that current level of external validation and regulations in place work together to consider highly likely that shark finning is not taking place. **SG80 is met.**

Current levels of external validation are preventing to score SG100. SG100 is not met.

Review of alternative measures to minimise mortality of unwanted catch

е	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	Bait main species: N/A All other main species (4 spp): Yes	Bait main species: N/A All other main species (4 spp): Yes	Bait species: N/A All other species (30 spp): Yes
Ration	ale			

SG60 and AG80 are dealing just with the main species. Apart from the flying jumbo squid (for which this SI is not applicable since it is a bait species), the other main species are: blue shark, pelagic thresher shark, blue marlin and swordfish. All these are commercial species with considerable commercial value and on which there is no catch limitation, so there are no incentives for under-reporting or for them to be discarded on the high seas.

In Ecuador, the first PAN-EC was reviewed in 2019 to design the new PAT-EC for the period 2020-2024.

At IATTC level, first the BYC and now the EBWG compiles data from the CPCs on a regular basis and shall review the potential effectiveness and practicality of alternative measures to minimise related mortality on bycatches.

Thus, SG60 and SG80 are met.

There is no evidence that this review shall be done on a biennial basis for all secondary species impacted by the UoA. **SG100 is not met.**

References

Agreement MPCEIP-SRP 2022-0068-A. Ecuadorian Executive Decree 362/2022 Ecuadorian Executive Decree Nº486/2007 Ecuadorian Agreement MPCEIP-SRP 2022-0068-A. Griffiths et al., 2022 Roa-Ureta and Wiff, 2022

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

Draft scoring range	<60
Information gap indicator	More information sought



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

Overall Performance Indicator score

Condition number (if relevant)



PI 2.2.3 – Secondary species information

PI 2	2.2.3	Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species								
Scorin	g Issue	SG 60	SG 80	SG 100						
	Informat	ion adequacy for assessme	nt of impacts on main seco	ndary species						
а	Guide	Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status. OR	Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status.	Quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.						
a	post	If RBF is used to score PI 2.2.1 for the UoA:	If RBF is used to score PI 2.2.1 for the UoA:							
		Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.							
	Met?	Flying jumbo squid: Yes All other main spp (4 spp): Yes	Flying jumbo squid: No All other main spp (4 spp): Yes	Flying jumbo squid: No All other main spp (4 spp): No						
Ration	ale									

This SI deals just with the main species. The main species considered are: blue shark, pelagic thresher shark, blue marlin, swordfish and flying jumbo squid (as bait species). None of them were classified as DD, so they are all assessed using the first part of the rationale.

Flying jumbo squid (Main bait species)

A stock assessment (Roa-Ureta and Wiff, 2022) has been recently performed for this species in the EPO. Thus, SG60 is met.

At this stage the team does not have evidence that catches of jumbo flying squid are being recorded in this fishery. Only qualitative information on the bait used could be gathered for the preparation of the ACDR. The stock assessment could not include catch data from Ecuador (Roa-Ureta and Wiff, 2022). Thus, **SG80 is not met.**

All other main species (4 spp)

The skippers have the obligation to record all catches in their logbooks. All landings shall be inspected by inspectors to get the Certificate of Monitoring and Control of Fisheries Landing (CMCDP). All main secondary species impacted by the UoA have commercial value and there is no incentive for underreporting or discarding at sea.

The IATTC performs analytical stock assessments for the blue marlin and swordfish (sometimes in collaboration with other RFMOs), and also a comprehensive risk assessment for 32 shark species, including the blue shark and the pelagic thresher shark.

Thus, the team considers that SG60 are SG80 are met.

However, the low observer coverage, and the fact that there are no analytical assessments of the two shark species are preventing the team to score SG100. **SG100 is not met.**

b Information adequacy for assessment of impacts on minor secondary species



	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?	Minor bait spp (4 spp): No All other minor spp (26spp): No
Ration	ale	

Minor bait species:

At this stage the team does not have evidence that catches of bait species are being recorded in this fishery. Thus, **SG100 is not met.**

All other minor species (26 spp.)

All landings shall be inspected by inspectors to get the Certificate of Monitoring and Control of Fisheries Landing (CMCDP), and observers' data allow to obtain quantitative information on the catches of minor secondary species. There are some quantitative information available to assess the status of the stripped marlin and the minor shark species. However, the status of many of the minor secondary remains unknown. Thus, **SG100 is not met.**

	Informati	Information adequacy for management strategy									
С	Guide post	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with a high degree of certainty whether the strategy is achieving its objective .							
	Met?	Bait main species (1sp): No All other main species (4 spp): Yes	Bait main species (1sp): No All other main species (4 spp): Yes	Bait species (1sp): No All other species (30 spp): No							
Dation	- 1 -										

Rationale

T Flying jumbo squid (Main bait species)

At this stage the team does not have evidence that catches of jumbo flying squid are being recorded in this fishery. Only qualitative information on the bait used could be gathered for the preparation of the ACDR. The stock assessment could not include catch data from Ecuador (Roa-Ureta and Wiff, 2022). Thus, **SG60 is not met.**

All other species

SG60 and SG80 deal only with the 4 main species: blue shark, pelagic thresher shark, blue marlin and swordfish.

Landing data collected by the inspectors, coupled with the observers' data, and the assessments performed by the IATTC (either analytical stock assessments or risk assessments in the case of sharks) support that information on the 4 main species impacted by the UoA is adequate to support a partial strategy to manage them. **SG60 and SG80 are met.**

SG100 deals with all minor species and request a high degree of certainty. Many of the secondary species are Data Deficient. The observer coverage is low to assess with high degree of certainty the impact of the UoA on species which might be partially or fully discarded. **SG100 is not met.**

References

Roa-Ureta and Wiff, 2022

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

Draft scoring range	60-79						
Information gap indicator	Information sufficient to score PI						
Overall Performance Indicator scores added from Clien	Overall Performance Indicator scores added from Client and Peer Review Draft Report stage						
Overall Performance Indicator score							
Condition number (if relevant)							



PI 2.3.1 - ETP species outcome

PI 2	2.3.1	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species								
Scoring	g Issue	SG 60	SG 80	SG 100						
а	Effects applicab	of the UoA on population le	/stock within national or i	nternational limits, where						
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.						
	Met?	Silky shark: Yes	Silky shark: No	Silky shark: No						
		All other ETF spp NA	All other ETF spp NA	All other ETP spp NA						

Rationale

A total of 13 ETP species were found to interact with the UoA based on landings and observers' data (see **Table 7.3.1.6**): 5 marine turtles and 8 shark and ray species. With the only exception of the silky shark (*C.falciformis*), retention on board of any of those species is prohibited by national and international regulations and all incidental interactions shall be returned to the sea and reported (see **section 7.3.1.4** for more details). However, **there is no limit to the incidental interactions and therefore this SI is Not Applicable to any of the other ETPs considered in this assessment.**

Silky shark

In the case of the silky shark, both the international and the national applicable regulations (IATTC Resolution C-21-06 and Ministerial Agreement MPCEIP-SRP-2022-0002-A, respectively), set limits to the catches of silky shark performed by longline vessels targeting pelagics. In the case of the IATTC regulation, catches of silky sharks of less than 100 cm TL shall be limited to 20% of the total number of silky sharks caught during the trip. While the National Regulation sets that: (i) incidental catches by longliners authorised for targeting large pelagic fish shall be lower than 20% of the total catches (in weight) per fishing trip, and (ii) individuals smaller than 100cm TL are not allowed. Thus, SI(a) is applicable for the silky sharks since the UoA catches are subject to national (and international) limits.

In this case, the national limits are stricter than the international ones because:

- The 20% threshold is measured in weight and nor in number of individuals and applies to all bycatches of silky sharks and not only to individual below 100cm TL.
- No individuals smaller than 100 cm TL are allowed.

Data from landings recorded between 2013 and 2022 (except for 2018 and 2019 which were not available), confirm that silky shark accounted for a range of <0,0 and 2,3% of the total annual catches (in weight) (**table 7.3.1.3**). This is in accordance with MPCEIP (2022a), which shows that silky shark accounted for 0,3% of the total catches (in weight) performed between October and December of 2020. Observers' data is provided in number of individuals, and data presented in **table 7.3.1.4** shows that the annual contribution of silky shark to the total observed catches (in number) between 2017 and 2021 ranged between 0 and 0,07%. All these sets of data indicate that it is likely that the UoA meets the legal requirements.

Besides, landings from the LL-TBS provided by the MPCEIP indicate that, despite annual catches of silky shark are higher than in the LL-DOL, the annual contribution of the silky shark to the total catches (in weight) is also well below the 20% set by the regulation (see table below). This indicates that is likely that the whole fishery (LL-Dol and LL-TBS) is achieving the national requirements.

Table 2.3.1.1. Landing volumes per species specific to mothership-based fishing operations using LL-DOL and LL-TBS between 2013-2021 (except for 2018 and 2019 which were not available). Landings in tones, and % accounts for the % of the silky shark compared to the total annual volume caught. Source: table elaborated by the MPCEIP based on Fisheries Landing Control Monitoring Certificates (CMCDP).

Especie	2013		2014	1	201	5	201	6	201	7	202	0	202	1	202	2
	t	%	t	%	t	%	t	%	t	%	t	%	t	%	t	%
LL-DOL	15,0	0,2	38,4	0,3	33,6	0,7	100,5	2,3	9,6	0,2	8,2	0,3	6,4	0,1	0,1	0,0
LL-TBS	215,2	3,1	213,3	3,7	152,6	3,2	21,8	1,6	187,5	1,5	213,1	2,5	275,3	2,3	200,7	1,8

Thus, SG60 is met for the silky shark.

They only MSC-certified fisheries in the area (or in-assessment) are purse seine fleets: <u>Eastern Pacific Ecuador Purse</u> <u>Seine Tropical Tuna Fishery</u> & <u>Eastern Pacific Ocean tropical tuna -purse seine (TUNACONS) fishery</u>. However, these fisheries target yellowfin tuna and their dolphinfish catches are marginal. Thus, it was not considered as an overlapping fishery. Besides, in the case of purse seiners no retention is allowed, all incidental interactions shall be recorded and returned to the sea. Thus, no catch limits are applicable to purse seiners and this SI is not applicable to that fishery.

The data sets mentioned above (landings and observers' records) have some constrains: (i) data per fishing trip were not available; (ii) no data on size frequencies was provided, so compliance with the national requirement banning retention of individuals below 100cm could not be assessed; and (iii) there are some discrepancies between the sources consulted to estimate observer coverage, but in any case, observer coverage is thought to be below 1% of total hooks used (see **section 7.3.1.4** for more details). This compromises the representativeness of the observations.

Thus, the team considers that SG80 is not met for the silky shark.

	Direct ef	fects				
b	Guide post	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.		
	Met?	Silky shark: N/A All other ETP spp.: RBF needed	Silky shark: N/A All other ETP spp.: RBF needed	Silky shark: N/A All other ETP spp.: RBF needed		

Rationale

A total of 13 ETP species were found to interact with the UoA based on landings and observers' data (see **Table 7.3.1.6**): 5 marine turtles and 8 shark and ray species. The silky shark (*Carcharhinus falciformis*) was already assessed in SI(a), while all the other species are assessed in this SI, i.e.: oceanic whitetip shark (*C.longimanus*), Scalloped hammerhead (Sphyrna lewini), great hammerhead (*S.mokarran*), bonnethead (*S.tiburo*), smooth hammerhead (*S.zygaena*), Spotted eagle ray (*Aetobatus laticeps*), Rays (*Mobula spp.*), Loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), hawkbill turtle (*Eretmochelys imbricata*), and olive Ridley turtle (*Lepidochelys olivacea*).

Retention on board of any of the species listed above is prohibited by national and international regulations and all incidental interactions shall be returned to the sea and reported (see **section 7.3.1.4** for more details). However, there is no limit to the incidental interactions.

Despite no interactions with seabirds have been reported by the observers, seabirds (albatrosses and petrels) and marine mammals will also be considered a scoring element for this SI, since they are protected species, they are known to interact with surface longlines, and they overlap with the fishing grounds where the UoA operate.

Protected sharks

Other than the silky shark, the only shark species protected reported in landings between 20117-2022 are the smooth hammerhead shark (S.zygaena) and the Pacific eagle ray (Aetobatus laticeps), both only in 2017 (the ratios were 0,2kg of smooth hammerhead shark for every ton of dolphinfish and 0,003 kg of Pacific eagle ray). See **tables 7.3.1.2 and 7.3.1.3.** However, landings prior to 2017 show that the list of (currently) protected sharks landed in this fishery also included: Ocean whitetip shark (C.longimanus, Scalloped hammerhead shark (S.lewini), great hammerhead (S.mokarran) and bonnethead (S.tiburo).



The only protected species recorded by observers between 2017 and 2021 are the silky shark and Mobula spp (MPCEIP, 2022c). The average ratio for that period was 0,36 individuals of silky shark for every 1000 individuals of dolphinfish caught, and 0,01 in the case of the Mobula. MPCEIP (2022c) does not provide the number of interactions per observed number of hooks fished. No data on the fate (released dead, alive or alive with injuries) of the sharks that interacted during this period has been provided to the team, although observers are thought to record these details.

A recent assessment of the vulnerability of sharks caught in pelagic fisheries in the Eastern Pacific Ocean (Griffiths et al, 2022) classified all protected shark species listed in table 7.3.1.5 (with the exception of ray species which were not assessed) as 'most vulnerable'. Sharks are long-lived and low fecundity species, and species with such characteristics are extremely vulnerable and even a selective fishery that captures a few individuals may cause serious effects on their populations' viability (Lewison et al 2004).

There are some discrepancies between the sources consulted to estimate observer coverage, but in any case, observer coverage is thought to be below 1% of total hooks used (see **section 7.3.1.4** for more details). Besides, the number of interactions per observed number of hooks fished is not provided in MPCEPI (2022c). This compromises the representativeness of the observations and makes it impossible for the data collected to be scaled to the fleet level, especially in the case of species with very low interaction frequencies, as it the case for the protected sharks. Also, the fate of the interactions is not reported. Finally, there is a remark inconsistency in the observers data (eg. interactions reported by the MPCEIP in 2021 are totally different depending on the source used -see section 7.3.1.4 for more details on this topic-, observer records should account for a higher species diversity -including shark species- than landings and this is not observed in the data sets provided for this assessment). Based on these constraints from the observers' data, the team considers that the impact of the UoA on the protected sharks listed in **table 7.3.1.5** cannot be analytically determined (with the only exception of silky shark which is assessed in SI(a)). Thus, they are considered as Data Deficient ETP components to be assessed using the RBF (Annex PF of the FCP), and not the Standard Assessment Tree (Annex SA). **RBF needed.**

Turtles

Regular interactions with marine turtles are being recorded by the observers (MPCEIP, 2022c), although the frequency of interactions is low, with an average ratio of interactions of 0,13 for every 1000 individuals of dolphinfish caught between 2017 and 2021 (min: 0,08 in 2018, 2020 & 2021; max: 0,20 in 2017). The green turtle (*Chelonia mydas*) accounts for 62% of the interactions, followed by the loggerhead turtle (*Caretta caretta*) (35%) and the olive ridley turtle (*Lepidochelys olivacea*) (3%). However, data from previous years (2013-2016) indicated that the olive ridley turtle (*Dermochelys coriacea*) was the species accounting for most of the interactions (67%), followed by the green turtle (31%).

The fishing season for dolphinfish matches with turtle nesting season in mainland Ecuador. This fishery keeps using Jhooks instead of circle hooks, which have demonstrated to be a useful tool to reduce turtle bycatch in other fisheries (Swimmer et al, 2017). Despite the scarcity on data about the bait species used, it is clear that Humbold squid (*D.gigas*) is the main species used as bait, and this bait type is known to attract marine turtles (Swimmer et al, 2017; MAAE-WildAid-GIZ., 2020). In the document of the National Plan for the conservation of sea turtles of Ecuador 2020-2024 (MAAE-WildAid-GIZ., 2020), the surface longline fishery is considered as a high magnitude threat which is present at the national level, for which reason it is considered of Critical Impact.

Marine turtles are long-lived and low fecundity species, and species with such characteristics are extremely vulnerable and even a selective fishery that captures a few individuals may cause serious effects on their populations' viability (Lewison et al 2004).

However, there are some discrepancies between the sources consulted to estimate observer coverage, but in any case observer coverage is thought to be below 1% of total hooks used (see **section 7.3.1.4** for more details). Besides, the number of interactions per observed number of hooks fished is not provided neither by MPCEPI (2022c) nor in Esparza-Ramirez et al 2018 as quoted in Resolution N^oMAAE-SPN-2021-001. This compromises the representativeness of the observations and makes it impossible for the data collected to be scaled to the fleet level, especially in the case of species with very low interaction frequencies, as it the case of marine turtles. Also, the fate of the interacted turtles (alive/injured/dead) for the most recent data is not reported, although observers are thought to record this information. Finally, there is a remark inconsistency in the observers data (eg. interactions reported by the MPCEIP in 2021 are totally different depending on the source used, species composition different dramatically for the two studied periods (2008-16 and 2017-2021)). Based on these constraints from the observers' data, the team considers that the impact of the UoA on marine turtles listed in **table 7.3.1.5** cannot be analytically determined, and they are all considered as Data



Deficient ETP components that shall be assessed using the RBF (Annex PF of the FCP) and not the Standard Assessment Tree (Annex SA). **RBF needed.**

Seabirds

Bycatch in longline fisheries is considered one of the main threats for the conservation of albatrosses and petrels worldwide (Jimenez et al. 2012). According to Jimenez et al (2012), the combined impact of the longline fleets operating in the Southwestern Atlantic could be sufficiently high to account for many of the observed declines in the populations of 3 species of albatrosses (*D. exulans*, *D. dabbenena* and *T. chlororhynchos*).

Albatrosses and petrels are long-lived and low fecundity species, and species with such characteristics are extremely vulnerable and even a selective fishery that captures a few individuals may cause serious effects on their populations' viability (Lewison et al 2004).

This assessed fishery operates across an enormous area in oceanic waters (see map in **section 5.1.3**), where different species of albatrosses and petrels protected by the Agreement on the Conservation of Albatrosses and Petrels (ACAP) are known to dwell. As far as the team is aware, no records of interactions with seabirds have been reported by observers on board. There are some discrepancies between the sources consulted to estimate observer coverage, but in any case, observer coverage is thought to be below 1% of total hooks used (see **section 7.3.1.4** for more details). This compromises the representativeness of the lack of observations, especially in the case of species with very low interaction frequencies, as would be the case of seabirds. Based on these constraints from the observers' data, the team considers that the impact of the UoA on seabirds cannot be analytically determined, and they are all considered as Data Deficient ETP components that shall be assessed using the RBF. **RBF needed.**

Marine mammals

Interactions between marine mammals and fleets using surface longlines (either by getting hooked or by getting entangled in buoy lines or main lines) have been documented in other parts of the world (Passadore et al 2015).

Marine mammals are long-lived and low fecundity species, and species with such characteristics are extremely vulnerable and even a selective fishery that captures a few individuals may cause serious effects on their populations' viability (Lewison et al 2004).

This assessed fishery operates across an enormous area in oceanic waters (see map in section 5.1.3), where different species of marine mammals' dwell. But, as far as the team is aware, no records of interactions with seabirds have been reported by observers on board. There are some discrepancies between the sources consulted to estimate observer coverage, but in any case, observer coverage is thought to be below 1% of total hooks used (see **section 7.3.1.4** for more details). This compromises the representativeness of the lack of observations, especially in the case of species with very low interaction frequencies, as would be the case of marine mammals. Based on these constraints from the observers' data, the team considers that the impact of the UoA on marine mammals cannot be analytically determined, and they are all considered as Data Deficient ETP components that shall be assessed using the RBF. **RBF needed.**

	Indirect effects			
С	Guide post	Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.	
	Met?	Silky shark: No All other ETP spp.: N/A	Silky shark: No All other ETP spp.: N/A	
Ration	ale			

Silky shark

The team is not aware that indirect effects on the silky shark have been considered for the UoA. SG80 is not met.

All other ETP species

All other ETP species were considered as DD and therefore shall be assessed using the RBF (Annex PF of the FCP) and not the Standard Assessment Tree (Annex SA). Thus, **this SI is Not Applicable.**



References

Ecuadorian Ministerial Agreement MPCEIP-SRP-2022-0002-A Griffiths et al., 2022 IATTC Resolution C-21-06 Jimenez et al. 2012 Lewison et al 2004 MAAE-WildAid-GIZ., 2020 MPCEIP. 2022a. MPCEIP. 2022a. Passadore et al 2015 Swimmer et al, 2017

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

Draft scoring range	Silky shark: 60-79 All other ETP species: RBF needed.
Information gap indicator	 Information sufficient to score PI: Data detailing observer coverage since 2011 Observed interactions with each protected species per hooks used. Annual estimations of total hooks used by the fleet Information on the fate (alive/dead) of the interactions with protected species UoA landings in 2018 and 2019
Overall Performance Indicator scores added from Clier	nt and Peer Review Draft Report stage

Overall Performance Indicator score

Condition number (if relevant)



PI 2.3.2 – ETP species management strategy

PI 2	2.3.2	 The UoA has in place precautionary management strategies designed to: meet national and international requirements; ensure the UoA does not hinder recovery of ETP species. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species				
Scoring	g Issue	SG 60	SG 80	SG 100		
	Manage	Management strategy in place (national and international requirements)				
а	Guide post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.		
	Met?	Silky shark: Yes All other ETP spp.: NA	Silky shark: Yes All other ETP spp.: NA	Silky shark: No All other ETP spp.: NA		
Ration	ale					

Silky shark

This species is included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to curb international trade.

As described in PI 2.3.1(a), there are conservation measures applicable to the longline fleets targeting large pelagics which are setting catch limits for this species both at international (IATTC Resolution C-21-06) and national (Ministerial Agreement MPCEIP-SRP-2022-0002-A). In this case, the national limits are stricter than the international ones. The IATTC C21-06 also states that the Commission shall prioritize research focused on identifying pupping area, post-release survival studies, improved handling practices to maximize post-release survival.

Besides, shark lines (individual lines attached to the floatline or to the floats directly and used to target sharks) are prohibited both at international level (through IATTC C-16-05), and at national level (Executive Decree Nº5486/2007). Also, the use of steel leaders is prohibited at national level since 2007 (Executive Decree Nº5486/2007), and at an international level is also prohibited for those fleets that have captured more than 20% of silky shark in weight on average in a year. Shark finning is prohibited both at international and national level, see PI 2.2.2(d) for more details on this topic.

Article 225 of the Executive Decree 362 passed in February 2022 states that all incidental interactions shall be recorded.

Based on the above, the team considers that SG60 is met.

Ecuador developed its first National Action Plan for sharks' management and conservation (PAN-EC) in 2013, valid for a period of 5 years. This PAN-EC was adopted as a national policy through Executive Decree Nº486/2007. A new PAT-EC was developed for the period 2020-2024, and it has also been adopted as National policy through Agreement MPCEIP-SRP 2022-0068-A.

The IATTC Resolution-19-08 states that each CPC shall ensure that at least 5% of the fishing effort made by its longline fishing vessels greater than 20m length carries a scientific observer. Besides, current national regulations oblige to comply with a minimum observer coverage of 10% of the fishing trips performed by the mothership vessels, and to increase it progressively up to 20% in 2024. Observers' data are reported to the SRP.

At the IATTC level, a new Permanent Working Group on Ecosystem and Bycatch (EBWG) was formally created in 2022 through the adoption of Resolution C-22-06, and its first meeting is expected for May 2023. Among the objectives of this WG is to evaluate and recommend measures and best practices to avoid, reduce and minimize catch and mortality of non-target species, effective methods for safe handling practices and release of non-target species, and the effects of



fishing on endangered species. This permanent WG replaces the previous WG on Bycatch (BYC) which had been meeting regularly in recent years.

Based on the above, the team considers that there is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which **is designed** to be highly likely to achieve national and international requirements for the protection of silky shark. Thus, **SG80 is met.**

According to the definitions provided in Table SA8 (FCP 2.01), a 'comprehensive strategy' is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses. The team considers that the strategy in place and described above is still not a comprehensive strategy. Thus, **SG100 in not met.**

Management strategy in place	(alternative)
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b	Guide post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	Silky shark: N/A Other protected sharks: Yes Turtles: Yes Seabirds: Yes Marine mammals: Yes	Silky shark: N/A Other protected sharks: Yes Turtles: Yes Seabirds: Yes Marine mammals: Yes	Silky shark: N/A Other protected sharks: No Turtles: No Seabirds: No Marine mammals: No

Rationale

Protected sharks

Most of the protected shark species (with the only exceptions spotted eagle ray and the bonnethead) listed in **table 7.3.1.6** are included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to curb international trade.

There are measures on the conservation of this shark species which applicable to the UoA at international (IATTC Resolutions C-05-03, C11-10, C15-04, C16-06) and national (Executive Decree N486/2007, Ministerial Agreements MPCEIP-SRP 2019-0019-A, 2020-0084A, 2022-0068-A, 2022-078-A). In general terms these regulations are prohibiting targeting sharks, shark finning, the use of shark lines, the use of steel leaders, and also the retention on board of all the protected sharks listed in **Table 7.3.1.6** (with the exception of the silky shark, as explained above in SIa). See **section 7.3.1.4.II** for more details on each of these measures.

Article 225 of the Executive Decree 362 passed in February 2022 states that all incidental interactions shall be recorded.

Based on the above, **SG60 is met.**

As described above in SI(a), Ecuador has design a National Action Plan for sharks' management and conservation and it is adopted as National policy. There is also an observer program applicable to the UoA which is expected to progressively increase observer coverage from current 10% up to 20% in 2024.

Besides, at the international level, the IATTC has just recently created a new Permanent Working Group on Ecosystem and Bycatch (EBWG) (IATTC Resolution C-22-06). Among the objectives of this WG is to evaluate and recommend measures and best practices to avoid, reduce and minimize catch and mortality of non-target species, effective methods for safe handling practices and release of non-target species, and the effects of fishing on endangered species. This permanent WG replaces the previous WG on Bycatch (BYC) which had been meeting regularly in recent years.

Based on the above, the team considers that there is a strategy in place that is expected to ensure the UoA does not hinder the recovery of protected shark species. Thus, **SG80 is met.**

According to the definitions provided in Table SA8 (FCP 2.01), a 'comprehensive strategy' is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses. The team considers that the strategy in place and described above is still not a comprehensive strategy. Thus, **SG100 in not met.**



Turtles

Article 225 of the Executive Decree 362 passed in February 2022 states that all incidental interactions shall be recorded, including interactions with marine turtles, seabirds and seabirds.

All marine turtles included in **table 7.3.1.6** are included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which means that they are species threaten with extinction and its trade is forbidden.

There are measures on the conservation of turtles which applicable to the UoA at international (IATTC Resolution C19-04) and national (Ministerial Agreement 212/1990). In general terms these regulations are prohibiting targeting, processing or trading with marine turtles. Although the IATTC Resolution goes beyond that point and details reporting requirement, mitigation measures, good handling practices on board to release the turtles. See **section 7.3.1.4.II** for more details on each of this regulation.

In addition, Ecuador is a signatory party of the Inter-American Convention for the Protection and Conservation of Sea Turtles (CIT). Several Resolutions for the conservation of the marine turtles in the Eastern Pacific Ocean have been adopted within the CIT framework.

Based on the above, **SG60 is met.**

Ecuador developed its first National Action Plan for marine turtles' management and conservation (PNCTM) in 2014, valid for a period of 5 years. This PNCTM was adopted as a national policy through Ministerial Agreement No. 324 passed in 2014. A new PNCTM has been developed for the period 2020-2030, and it has also been adopted as National policy through Agreement Resolution MAAE-SPN-2021-001.

As explained above in SI(a), there is also an observer program applicable to the UoA which is expected to progressively increase observer coverage from current 10% up to 20% in 2024. Observers shall record all incidental catches, including marine turtles.

Besides, at the international level, the IATTC has just recently created a new Permanent Working Group on Ecosystem and Bycatch (EBWG) (IATTC Resolution C-22-06). Among the objectives of this WG is to evaluate and recommend measures and best practices to avoid, reduce and minimize catch and mortality of non-target species, effective methods for safe handling practices and release of non-target species, and the effects of fishing on endangered species (including marine turtles). This permanent WG replaces the previous WG on Bycatch (BYC) which had been meeting regularly in recent years.

The CIT monitoring parties' compliance with the Convention and its resolutions, and Member states are required to report annually on their activities supporting the IAC.

Based on the above, the team considers that there is a strategy in place that is expected to ensure the UoA does not hinder the recovery of protected turtles. Thus, **SG80 is met.**

According to the definitions provided in Table SA8 (FCP 2.01), a 'comprehensive strategy' is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses. The team considers that the strategy in place and described above is still not a comprehensive strategy. Thus, **SG100 in not met.**

Seabirds

IATTC Resolution C-11-02 to mitigate the impact on seabirds of fishing for species covered by the IATTC sets different measures applicable to longline fleets, including the need to apply mitigation measures for fleets operating in the are where the UoA operates. See **section 7.3.1.4.III** for more details on each of these measures.

At a national level, Article 225 of the Executive Decree 362 passed in February 2022 states that all incidental interactions shall be recorded, including interactions with marine turtles, reptiles, penguins and seabirds.

Based on the above, SG60 is met.

Ecuador signed and ratified the ACAP in 2003, and it is in force since February 2004. Ecuador developed a National Action Plan for the conservation of albatrosses and petrel in 2007.

Besides, at the international level, the IATTC has just recently created a new Permanent Working Group on Ecosystem and Bycatch (EBWG) (IATTC Resolution C-22-06). Among the objectives of this WG is to evaluate and recommend



measures and best practices to avoid, reduce and minimize catch and mortality of non-target species, effective methods for safe handling practices and release of non-target species, and the effects of fishing on endangered species (including seabirds). This permanent WG replaces the previous WG on Bycatch (BYC) which had been meeting regularly in recent years.

Based on the above, SG80 is met.

According to the definitions provided in Table SA8 (FCP 2.01), a 'comprehensive strategy' is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses. The team considers that the strategy in place and described above is still not a comprehensive strategy. Thus, **SG100 in not met.**

Marine mammals

Article 225 of the Executive Decree 362 passed in February 2022 states that all incidental interactions shall be recorded, including interactions with marine turtles, reptiles, penguins, and seabirds.

Ecuador protected all whales within its EEZ through the Ministerial Agreement 196 passed in June 1990, and more recently extended this protection to all marine mammals through the Ministerial Agreement MPCEIP-SRP-2021-0238-A.

At international level, Ecuador has signed and ratified the Agreement on the International Dolphin Conservation Program (AIDCP), a binding multilateral agreement. The IATTC provides the Secretariat for the program, which covers the Eastern Pacific Ocean.

Based on the above, SG60 and SG80 are met.

	Manage	ment strategy evaluation		
с	Guide post	The measures are considered likely to work, based on plausible argument (e.g.,general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Silky shark: Yes Other protected sharks: Yes Turtles: Yes Seabirds: Yes Marine mammals: Yes	Silky shark: No Other protected sharks: No Turtles: No Seabirds: No Marine mammals: No	Silky shark: No Other protected sharks: No Turtles: No Seabirds: No Marine mammals: No
	_			

Rationale

Silky shark

Both the international and the national regulations limiting the catches of the silky shark to a 20% limit recognise that this is an interim limit on which to base conservation and management measures, and that it shall be revised based on recommendations by the scientific data, once available have been improved. The IATTC C21-06 specifies that at the SAC meeting in the year 2023 and at the subsequent meeting of the IATTC in 2023, the IATTC scientific staff shall present to the SAC an analysis of the unloading, observer, and long-term sampling program data on the catches of sharks in the fisheries in central America with which they shall also recommend any improvement of the resolution.

The team considers that SG60 is met.

A recent assessment of the vulnerability of sharks caught in pelagic fisheries in the Eastern Pacific Ocean (Griffiths et al, 2022) classified the silky shark as 'most vulnerable'.

The IATTC C21-06 recognizes that the interim 20% limit was adopted in the absence of data and scientific analysis, and states that available data shall be improve and further research is needed to establish the appropriateness of this catch limit. Griffiths et al (2022) states that for species listed as "most vulnerable" (and silky shark is one of them), significant research and/or monitoring efforts are required to fill crucial biological and/or ecological data gaps and to improve distribution information in order to optimize species distribution models, or to develop management measures



to reduce the potential for populations of some particularly sensitive species to further decline or even extinction due to their restricted endemic distributions in the EPO.

In the preamble of C-19-08 it is acknowledged that the IATTC scientific staff and the IATTC Working Group on Bycatch have repeatedly recommended at least 20% observer coverage on longline vessels fishing for tunas in the Convention Area, and also that the Scientific Advisory Committee (SAC) determined that the appropriate measure of longline fishing effort for calculating observer coverage is "number of hooks." As discussed in previous subsections, despite the observer coverage in Ecuador thought to be around 9% of the fishing trips performed by the mothership vessels, the actual coverage in number of hooks is likely to be below 1%, compromising the representativeness of the of the observations, especially in the case of species with very low interaction frequencies, as would be the case of the silky shark.

Thus, the team considers at this stage **SG80 is not met.**

All other protected sharks

The strategy described in SI(b) is consistent with similar strategies adopted in other fisheries. Besides, landing and observers' data confirm that the LL-DOL is a highly selective gear and interactions with protected sharks occur at a low frequency rate. Thus, **SG60 is met.**

A recent assessment of the vulnerability of sharks caught in pelagic fisheries in the Eastern Pacific Ocean (Griffiths et al, 2022) classified all protected shark species listed in table 7.3.1.5 (with the exception of ray species which were not assessed) as 'most vulnerable'. This study states that for species listed as "most vulnerable", significant research and/or monitoring efforts are required to fill crucial biological and/or ecological data gaps and to improve distribution information in order to optimize species distribution models, or to develop management measures to reduce the potential for populations of some particularly sensitive species to further decline or even extinction due to their restricted endemic distributions in the EPO.

In the preamble of C-19-08 it is acknowledged that the IATTC scientific staff and the IATTC Working Group on Bycatch have repeatedly recommended at least 20% observer coverage on longline vessels fishing for tunas in the Convention Area, and also that the Scientific Advisory Committee (SAC) determined that the appropriate measure of longline fishing effort for calculating observer coverage is "number of hooks." As discussed in previous subsections, despite the observer coverage in Ecuador thought to be around 9% of the fishing trips performed by the mothership vessels, the actual coverage in number of hooks is likely to be below 1%, compromising the representativeness of the of the observations, especially in the case of species with very low interaction frequencies, as would be the case of the protected shark species listed in **table 7.3.1.6.** Besides, data on post-capture survival rates were not provided.

Thus, the team considers at this stage **SG80 is not met.**

Turtles

The strategy described in SI(b) is consistent with similar strategies adopted in other fisheries. Besides, observers' data confirm that the LL-DOL is a highly selective gear and interactions with marine turtles occur at a very low frequency rate. Thus, **SG60 is met.**

In the preamble of C-19-08 it is acknowledged that the IATTC scientific staff and the IATTC Working Group on Bycatch have repeatedly recommended at least 20% observer coverage on longline vessels fishing for tunas in the Convention Area, and also that the Scientific Advisory Committee (SAC) determined that the appropriate measure of longline fishing effort for calculating observer coverage is "number of hooks." As discussed in previous subsections, despite the observer coverage in Ecuador thought to be around 9% of the fishing trips performed by the mothership vessels, the actual coverage in number of hooks is likely to be below 1%, compromising the representativeness of the of the observations, especially in the case of species with very low interaction frequencies, as would be the case of the seabirds. Besides, data on post-capture survival rates were not provided.

Thus, the team considers at this stage **SG80 is not met.**

Seabirds

The strategy described in SI(b) is consistent with similar strategies adopted in other fisheries. Thus, SG60 is met.

In the preamble of C-19-08 it is acknowledged that the IATTC scientific staff and the IATTC Working Group on Bycatch have repeatedly recommended at least 20% observer coverage on longline vessels fishing for tunas in the Convention Area, and also that the Scientific Advisory Committee (SAC) determined that the appropriate measure of longline fishing effort for calculating observer coverage is "number of hooks." As discussed in previous subsections, despite the observer coverage in Ecuador thought to be around 9% of the fishing trips performed by the mothership vessels, the actual



coverage in number of hooks is likely to be below 1%, compromising the representativeness of the of the observations, especially in the case of species with very low interaction frequencies, as would be the case of the marine turtles listed in **table 7.3.1.6**.

Thus, the team considers at this stage SG80 is not met.

Marine mammals

The strategy described in SI(b) is consistent with similar strategies adopted in other fisheries. Thus, SG60 is met.

In the preamble of C-19-08 it is acknowledged that the IATTC scientific staff and the IATTC Working Group on Bycatch have repeatedly recommended at least 20% observer coverage on longline vessels fishing for tunas in the Convention Area, and also that the Scientific Advisory Committee (SAC) determined that the appropriate measure of longline fishing effort for calculating observer coverage is "number of hooks." As discussed in previous subsections, despite the observer coverage in Ecuador thought to be around 9% of the fishing trips performed by the mothership vessels, the actual coverage in number of hooks is likely to be below 1%, compromising the representativeness of the of the observations, especially in the case of species with very low interaction frequencies, as would be the case of the marine mammals listed in **table 7.3.1.6**.

Thus, the team considers at this stage SG80 is not met.

	Management strategy implementation			
d	Guide post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		Silky shark: Yes Other protected sharks: Yes Turtles: No Seabirds: No Marine mammals: No	Silky shark: No Other protected sharks: No Turtles: No Seabirds: No Marine mammals: No

Rationale

Silky sharks

Both landings and observers' data indicate that the rate of bycatches of silky sharks when using LL-DOL is well below the limits set at international and national levels. It is important to remark that these sets of data are previous to the adoption of these catch limits, so there was not incentive for underreporting. Thus, **SG80 is met.**

However, some constrains are preventing the team to consider that there is clear evidence to assess if the strategy strategy is being implemented successfully and is achieving its objective: (i) data per fishing trip were not available; (ii) no data on size frequencies was provided, so compliance with the national requirement banning retention of individuals below 100cm could not be assessed; and (iii) there are some discrepancies between the sources consulted to estimate observer coverage, but in any case, observer coverage is thought to be below 1% of total hooks used (see **section 7.3.1.4** for more details). This compromises the representativeness of the observations. Thus, **SG100 is not met.**

All other protected sharks

Data shown in **table 7.3.1.3** show that no landings have occurred after a shark species has been prohibited. The presence of observers on board and the mandatory presence of inspectors during offloading should discourage the retention on board or shark finning of any protected shark species. Thus, at this stage the team considers that **SG80** is **met.**

The low observer coverage, and the lack of information in relation to the frequency of inspections performed and infringements identified are preventing the team to consider that there are clear evidence of successful implementation. Besides, the lack of information on the fate (alive/dead) of the recorded interactions limits the ability to assess whether the measures is achieving the objective of not hindring the recovery of these species. Thus, **SG100 is not met.** Also, at this stage it is not clear if, in the case of sharks, the obligation to record incidental interactions in the logbook (Article 225, Ex-.Dec 362/2022) is being accomplished. This issue shall be further investigated during the site visit.



Turtles

As far as the team is aware, the obligation to record all incidental interactions with turtles, seabirds and marine mammals in the logbook (Article 225, Ex-.Dec 362/2022) is not being followed.

IATTC C19-04 requires employing at least one of the following mitigation measures:

- i. Use only large circle hooks,
- ii. Use only finfish for bait, OR
- iii. Another mitigation measure to reduce sea turtle bycatch that has been approved by the Commission. A proposal for such a measure shall be submitted to the Bycatch Working Group at its meeting in the year prior to desired implementation, for review and potential recommendation to the Scientific Advisory Committee (SAC) and approval of the Commission.

The use of J-hooks is authorised in Ecuador (Agreement 070/2011), and the Humbolt squid is the most commonly used bait species. Thus, the UoA is not applying neither (i) nor (ii) and, as far as the team is aware Ecuador has not submitted another mitigation measure to the BYC.

The text of the PNCTM (included in Agreement MAAE-SPN-2021-001) acknowledges that the use of circle hooks has been found to be effective in trials conducted in Ecuador. However, this measure was considered unattractive by fishermen as it significantly decreases the capture rate of the target species. This document also acknowledges that the use of releasers to remove the hook is not widespread among Ecuadorian fishermen despite capacity building session have been implemented as part of an effort to improve handling and release practices on board.

Thus, SG80 is not met.

Seabirds

As far as the team is aware, the obligation to record all incidental interactions with turtles, seabirds and marine mammals in the logbook (Article 225, Ex-.Dec 362/2022) is not being followed.

The fact that observers have not recorded a single interaction with seabirds during the period 2017-2021 differs from what is expected in a surface longline fishery practiced in such a large area and suggests that the recording of interactions of birds by observers may not be performing correctly.

Besides, despite the fishing area falls within the area depicted in **Figure 7.3.1.1** the team is not aware that the UoA has implemented any of the mitigation measures detailed in IATTC C-11-02 (see **table 7.3.1.7**).

Thus, SG80 is not met.

Marine mammals

As far as the team is aware, the obligation to record all incidental interactions with turtles, seabirds and marine mammals in the logbook (Article 225, Ex-.Dec 362/2022) is not being followed.

The fact that observers have not recorded a single interaction with marine mammals during the period 2017-2021 differs from what is expected in a surface longline fishery practiced in such a large area, and suggests that the recording of interactions of marine mammals by observers may not be performing correctly.

Review of alternative measures to minimise mortality of ETP species

e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA- related mortality ETP species, and they are implemented, as appropriate.
	Met?	All protected sharks: Yes Turtles: No Seabirds: No Marine mammals: No	All protected sharks: Yes Turtles: No Seabirds: No Marine mammals: No	All protected sharks: No Turtles: No Seabirds: No Marine mammals: No
Ration	ale			



All protected sharks

At IATTC level, first the BYC and now the EBWG compiles data from the CPCs on a regular basis and shall review the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species, such as all protected shark species listed in **table 7.3.1.6**. The EBWG is now a permanent WG a regular schedule of meetings.

In Ecuador, the first PAN-EC was reviewed in 2019 in order to design the new PAT-EC for the period 2020-2024.

Most of the regulations on the conservation for protected sharks have been elaborate and passed recently, both at international level and national level. This can be considered as a result of a review process that emphasized the need to adopt stricter regulations to minimize mortality caused by fishing. **Thus, SG60 and SG80 are met.**

There is no evidence that this review shall be done on a biennial basis. SG100 is not met.

Turtles

At IATTC level, first the BYC and now the EBWG compiles data from the CPCs on a regular basis and shall review the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species, such as marine turtles listed in **table 7.3.1.6**.

In 2019 the IATTC issued a new Resolution on the conservation for marine turtles (C-04-07). This Regulation superseded a previous Resolution from 2004 on a 3-year program to mitigate the impact of fishing on turtles.

At a national level, Ecuador reviewed its first PNCTM in 2020 and elaborated a new one for the period 2021-2030.

However, Ecuador does not comply with the mitigation measures detailed in IATTC C-19-04 and there is no evidence that a review of the potential effectiveness and practicality of alternative measures to minimize the mortality of turtles has been performed at a national level. Thus, **SG60 is not met.**

Seabirds

At IATTC level, first the BYC and now the EBWG compiles data from the CPCs on a regular basis and shall review the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of marine turtles listed in **table 7.3.1.6**.

The only IATTC Resolution on the mitigation of the impacts on seabirds (C-11-02) dates from 2011, and the Ecuadorian fleet using surface longline does not comply with the use of mitigation measures included in that regulation.

Despite Ecuador has signed and ratified ACAP and elaborated a National Plan of the Conservation of Albatrosses and Petrels in 2007, there is no evidence that a review of the potential effectiveness and practicality of alternative measures to minimize the mortality of seabirds has been performed at a national level. Thus, **SG60 is not met.**

Marine mammals

As far as the team is aware, no review of potential alternative measures to minimise mortality of the UoA on marine mammals has been performed. **SG60 is not met**.

References

Ecuadorian Executive Decree 362/2022 Ecuadorian Executive Decree 486/2022 Ecuadorian Executive Decree 5486/2022 Ecuadorian Ministerial Agreement 196 /1990 Ecuadorian Ministerial Agreement 212 /1990 Ecuadorian Ministerial Agreement 070 /2011 Ecuadorian Ministerial Agreement MPCEIP-SRP-2021-0238-A. Ecuadorian Ministerial Agreement MPCEIP-SRP 2019-0019-A, Ecuadorian Ministerial Agreement MPCEIP-SRP-2020-0084A, Ecuadorian Ministerial Agreement MPCEIP-SRP-2022-0068-A, Ecuadorian Ministerial Agreement MPCEIP-SRP-2022-0068-A, Ecuadorian Ministerial Agreement MPCEIP-SRP-2022-0068-A, Ecuadorian Ministerial Agreement MPCEIP-SRP-2022-078-A Griffiths et al., 2022 IATTC Resolution C-22-06 IATTC Resolution C19-04



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

Draft scoring range	<60
Information gap indicator	 Information sufficient to score PI: Request detailed information on the level of compliance with ETP conservation measures Request information on the compliance with the obligation to record all interactions in the logbook (Art 225, Ex.Dec362/2022) Request information about training sessions on good handling and release practices performed with fishermen Request information on the training followed by the observers, and manuals provided. Institution responsible to implement the training, content Check if there is information about any process to review effectiveness of alternative measures to minimize mortality of ETPs

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

Overall Performance Indicator score

Condition number (if relevant)



PI 2.3.3 – ETP species information

PI 2	2.3.3	Relevant information is collected to support the management of UoA impacts on ETP species, including: - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species			
Scoring	g Issue	SG 60	SG 80	SG 100	
	Informat	ion adequacy for assessme	ent of impacts		
а	Guide post	QualitativeinformationisadequatetoestimatetheUoA related mortality on ETPspecies.ORIf RBF is used to score PI2.3.1 for the UoA:QualitativeinformationisadequatetoestimateproductivityandsusceptibilityattributesforETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. OR If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.	
	Met?	Silky shark: Yes All other ETP sharks: Yes Turtles: Yes Seabirds: Yes Marine mammals: Yes	Silky shark: No All other ETP sharks: Yes Turtles: Yes Seabirds: No Marine mammals: No	Silky shark: No All other ETP sharks: No Turtles: No Seabirds: No Marine mammals: No	

Rationale

As indicated in PI 2.2.1, the impact of the UoA on all ETP species cannot be analytically determined (with the only exception of silky shark) and RBF should be triggered to assess their status against that SI. Thus, the first part of the SI shall be used to assess the silky shark, while second part of Scoring Issue shall be used for all the other species.

Silky shark

A recent assessment of the vulnerability of sharks caught in pelagic fisheries in the Eastern Pacific Ocean provides valuable information to assess the status of the silky shark (Griffiths et al, 2022). The species was classified as 'most vulnerable'. Also, Lennert-Cody et al (2022) updated stock status indicators for this species in the EPO.

In the case of the silky shark a national regulation passed in 2022 allows longline fisheries to retain incidentally caught individuals if they account \leq 20% of the total catches (in weight) per fishing trip. Since this threshold is well above the historical bycatches of this species in this fishery, landing data is considered as a reliable data source to assess the impact of this fishery on this species. Besides, there are also data from observers on board. In both cases, there are available records going back in time to 2013.

However, the following constrains on the observers data are preventing the team to score SG80:

- i. There are inconsistencies between the different sources provided when it comes to assess the obsever coverage.
- ii. Only the fishing operations performed by the .mothership vessels are observed. None of the fishing operations performed on board the fiberglass skiff is being observed (and the number of registered fiberglass skiffs (2.844 in 2022 according to MPCEIP 2022b) is more than 10 times higher than the number of mothership vessels (244).



- iii. The number of interactions per observed number of hooks fished is not provided in MPCEPI (2022c). But based on data presented in MPCEIP (2022e) it can be estimated that less than 1% of the total hooks used are being observed (probably no more than 0,3%).
- iv. The fate of the interacted individuals (alive/dead) is not reported, although observers are thought to record this data.
- v. There is a remark inconsistency in the observers data (eg. interactions reported by the MPCEIP in 2021 are totally different depending on the source used, observer records should account for a higher species diversity -including shark species- than landings and this is not observed in the data sets provided for this assessment).

Thus, SG80 is not met.

Other protected sharks

Information to asses productivity attributes on the shark species is available at different open data base on fish, such as <u>FishBase</u>. Besides, recent assessment of the vulnerability of sharks caught in pelagic fisheries in the Eastern Pacific Ocean is also available (Griffiths et al, 2022).

The fishery dependent information (positions and duration of the hauls, other effort indicators, catches, landings, discards, ...) to assess susceptibility is collected mainly in through:

- Information generated by the fishing vessels: logbooks (mandatory), VMS (mandatory).
- Landing inspections: All landings shall be inspected at port arrival. There are available records going back in time to 2013.
- Data collected by the observers: Observers are recording interactions with sharks. There are available records going back in time to 2013.

Thus, the team consider that there is some quantitative information is adequate to assess productivity and susceptibility attributes for protected sharks and turtles. Thus, **SG60 and SG80 are met.**

Observer coverage is low (<10% of the trips performed by the mothership vessels, no observers on board fiberglass skiffs), the rate of interactions per hook used is not provided, the fate of the interactions (alive/dead) is not provided. Thus, **SG100 is not met.**

Turtles

Assessments on the status of the marine turtles listed in table 7.3.1.6 is at the <u>IUCN website</u>. This information can be used to assess the productivity attributes.

Maps generated using VMS data and the interactions recorded by the observers on board the UoA can be used to assess the susceptibility attributes.

Thus, the team consider that there is some quantitative information is adequate to assess productivity and susceptibility attributes for protected sharks and turtles. Thus, **SG60 and SG80 are met.**

Observer coverage is low (<10% of the trips performed by the mothership vessels, no observers on board fiberglass skiffs), the rate of interactions per hook used is not provided, the fate of the interactions (alive/dead) is not provided. Thus, **SG100 is not met.**

Seabirds and marine mammals

Assessments on the status of the marine turtles listed in table 7.3.1.6 is at the <u>IUCN website</u>. This information can be used to assess the productivity attributes.

Maps generated using VMS data can be used to assess the susceptibility attributes. Despite there are no records of interactions between the UoA with seabirds and marine mammals, it will be possible to get qualitative information to characterise these interactions during the RBF workshops. Besides, papers on the rate of interactions between surface longliners and these species are available from other similar fisheries (Jimenez et al. 2012, Passadore et al 2015). Thus, **SG60 is met.**

The low observer coverage already discussed in previous subsections compromises the representativeness of the lack of interactions recorded, especially in the case of species with very low interaction frequencies, as would be the case of seabirds. Thus, **SG80 is not met.**



	Information adequacy for management strategy				
b	Guide post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimise mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.	
	Met?	Νο	Νο	Νο	

Rationale

There are some discrepancies between the sources consulted to estimate observer coverage, but in any case, observer coverage is thought to be below 1% of total hooks used (see **section 7.3.1.4** for more details). This compromises the representativeness of the observations, in particular with species with low rates of interactions, such as ETP species.

Besides, observers' data provided to the team do not provide the number of interactions per observed number of hooks fished, and do not provide the fate of the interactions (alive/dead). This information is key to be able to extrapolate from the observations the total impact of the fleet, as well as to evaluate the post-release survival rates. It is also key to evaluate the implementation and effectiveness of good practices for handling on board and for the release of species that are included in many of the regulations. In the case of the silky shark, it is also necessary to record size to assess if the prohibition to retain individuals smaller than 100cm is being accomplished. While in the case of seabirds and marine mammals the lack of any interaction recorded in a span of 5 years, suggests that the recording of interactions of birds by observers may not be performing correctly.

The team considers that observers data is not adequate to support the measures adopted for the conservation of the ETP listed in **table 7.3.1.6**.

References

Griffiths et al., 2022 Jimenez et al. 2012, MPCEIP 2022b MPCEIP 2022c MPCEIP 2022e Passadore et al 2015

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

Draft scoring range	<60
Information gap indicator	Information sufficient to score PI

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.4.1 – Habitats outcome

PI 2	2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scorin	oring Issue SG 60 SG 80 SG 100		SG 100	
	Commonly encountered habitat status			
а	Guide post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	Yes	Yes	No
Ration	ale			

Commonly encountered habitats are defined by MSC Requirements (FCR GSA3.13.3.1) as those preferred by the target species, that the UoA's gear is designed to exploit, and/or make up a reasonable portion of the UoA's fishing area. The mahi mahi fishery with doradero (thin surface longline) takes place at around 6-13 m depth (Martínez-Ortíz & Zúñiga-Flores, 2012; Martínez-Ortiz et al., 2015) in oceanic waters as far as 1000 W, west of the Galapagos Islands therefore, the epipelagic habitat in the Southeastern Pacific Ocean is considered as the commonly encountered habitat for the purpose of this assessment.

Pelagic habitats function is mostly determined by their physico-chemical properties (Raymond, 2011). The status of pelagic habitats is affected by human induced pressures such as eutrophication and hazardous substances, as well as by natural and human-induced changes in climate (HELCOM, 2018). The fishery, however, will not change the characteristics of the water column (for example, the temperature, salinity, currents) and it does not come into contact with benthic habitats.

Therefore, it is highly unlikely that the fishery will reduce the structure and function of the pelagic habitat to a point where there is serious or irreversible damage. Hence, meeting **SG80**.

However, as there is no evidence of it, **SG100 is not met.**

	VME habitat status			
b	Guide post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	ΝΑ	ΝΑ	ΝΑ
Ration	ale			

As mentioned in SIa, the mahi mahi doradero fishery takes place at around 9-14 m depth in oceanic waters as far as 1,400 nm from the mainland coast west off the Galapagos Islands. Due to the operational procedures of this type of fishing, neither the seabed nor any VMEs are encountered.

In addition, epipelagic habitats in open waters are not included in the definition of paragraph 42, subparagraphs (i)-(v) of the FAO Guidelines on Vulnerable Marine Ecosystems (VMEs), as described in MSC FCR GSA3.13.3.2. Therefore, this **SI is not relevant**.



Minor habitat status				
С	Guide post			There is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.
	Met?			No
Ration	ale			

Minor habitats are defined by MSC as those that do not fall within the classification of Commonly Encountered Habitats or VMEs (SA3.13.3).

Taking into account that the whole fishing area is considered a commonly encountered habitat, no minor habitats have been identified in this assessment.

Moreover, as there is no evidence on the likely impact of the fishery on the sea bottom, SG100 is not met.

References				
Helcom, 2018 Martínez-Ortíz & Zúñiga-Flores, 2012; Martínez-Ortiz et al., 2015 Raymond, 2011				
Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage				
Draft scoring range	≥80			
Information gap indicator	Information sufficient to score PI			
Overall Performance Indicator scores added from Client and Peer Review Draft Report stage				
Overall Performance Indicator score				
Condition number (if relevant)				


PI 2.4.2 – Habitats management strategy

PI 2	2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats			
Scoring Issue		SG 60	SG 80	SG 100	
а	Manage	ment strategy in place			
	Guide post	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.	
	Met?	Yes	Yes	No	
Rationale					

MSC FCR Table SA8, states that "the term "if necessary" is used in the management strategy PIs at SG60and SG80 for the primary species, secondary species, habitats and ecosystems components. This is to exclude the assessment of UoAs that do not impact the relevant component at these SG levels".

Bearing in mind that the present fishery is highly unlikely to impact benthic habitats, the term "if necessary" does apply here and no measures or partial strategy are required. Hence, **SG60 and SG80 are met.**

MSC FCR v2.0 Table GSA8 for "Pelagic longline UoA targeting migratory pelagic species – There is little or no known bottom contact by the gear, except perhaps in cases of gear loss. The species targeted cannot be caught using trawl or other bottom-contacting gear", states that "The use of the gear, the understanding that comes from years of peer-reviewed research about its impacts, and the specific management strategy that mandates only its use could be construed as a cohesive and strategic arrangement. This is supported by demonstrable understanding about how the use of pelagic longlines work to avoid impacting benthic habitats specifically, and some understanding about the impacts of lost gear on habitat and the relative effects of such impacts are deemed to be low risk for overall habitat health. Periodic assessments (i.e., directed research and risk assessments) are undertaken to inform management decision makers about lost-gear impacts to ensure that management strategies are working and are demonstrably avoiding serious or irreversible harm to "main" habitats and to determine whether changes need to be made to mitigate unacceptable impacts".

As there is no strategy in place for managing the impacts of the fishery on habitats, SG100 is not met.

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

As mentioned above, the mahi mahi fishery is an oceanic fishery, which is confirmed by the UoA logbooks and the VMS requirement for motherships which allows continuous monitoring.

Moreover, as stated in SIa, management measures/partial strategy as described under SGs 60 and 80 are not required, therefore, **SG60 and SG80 are met.**

As there is no full strategy, there is also no testing of it, therefore, **SG100 is not met**.



	Manage	Management strategy implementation				
С	Guide post		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).		
	Met?		Yes	No		
Ration	ale					

As confirmed by the UoA logbooks and the VMS requirement for motherships which allows continuous monitoring, the mahi mahi fishery is an oceanic fishery whose commonly encountered habitat is the epipelagic habitat, and which does not interact directly with any benthic habitats.

As stated in SIa, no measures or partial strategy are required, therefore this **SG80 is met**. But in the absence of a full strategy, **SG100 is not met**.

	Complia measure	nce with management req es to protect VMEs	uirements and other MSC	UoAs'/non-MSC fisheries'
d		There is qualitative evidence that the UoA complies with its management requirements to	There is some quantitative evidence that the UoA complies with both its	There isclearquantitativeevidencethattheUoAcomplieswithbothits
	Guide post	protect VMEs.	management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.

NA

Rationale

Met?

NA

As mentioned in PI 2.4.1, the fishery takes place only in the epipelagic habitat where there are no VMEs.

NA

Therefore, as there are no management requirements to protect VMEs, this SI is not relevant.

References

The CAB shall list any references here, including hyperlinks to publicly-available documents.

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

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

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.4.3 – Habitats information

PI 2	2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat			
Scoring Issue		SG 60	SG 80	SG 100	
	Informat	ion quality			
а	Guide post	The types and distribution of the main habitats are broadly understood . OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.	
	Met?	Yes	Yes	No	
Ration	Rationale				

the commonly encountered habitat.

As explained in Section 3.4.1, the fishery activity (Figure 3.4.1.1.1) lays between two of the world's Large Marine Ecosystems (LMEs) (see Figure 3.4.1.4.1), the Pacific Central-American Coast LME and the Humboldt Current LME. Both are broadly characterized in Heileman, 2009 and Heileman et al., 2009, respectively.

In addition, one of the functions of the IATTC under the 2003 Antigua Convention is to "adopt, as necessary, conservation and management measures and recommendations for species belonging to the same ecosystem and that are affected by fishing for, or dependent on or associated with, the fish stocks covered by this Convention, with a view to maintaining or restoring populations of such species above levels at which their reproduction may become seriously threatened". Therefore, among other issues, a description of the offshore pelagic ecosystem of the tropical and subtropical Pacific Ocean, and the oceanographic conditions in the Eastern Pacific Ocean mostly regarding their effects on tuna fisheries are available (IATTC, 2013; 2015; 2019b).

Jiménez – Santistevan (2008) has also characterized the equatorial Pacific Ocean between the Galapagos Islands and continental Ecuador.

All this shows that the main habitat is broadly understood, hence, meeting SG60.

Figure 7.3.1.12 shows the protected marine areas in the South Eastern Pacific Ocean where the UoA fishery operates. The characteristics of each of these areas can be consulted in websites such as the MPAtlas website (http://mpatlas.org/explore/) or the protected planet website (http://www.protectedplanet.net/). Nevertheless, these protected marine areas are outside the spatial range of the fishery, therefore, they are not relevant here.

Moreover, as there are no vulnerable habitats in the pelagic ecosystem that could be damaged or impacted by the use of the doradero gear, SG80 is also met.

However, as the detailed distribution of all habitats is not known over their entire range, SG100 is not met

b Information adequacy for assessment of impacts



	Guide	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.	The physical impacts of the gear on all habitats have been quantified fully.
	post	If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	Yes	Yes	No
Ration	ale			

The nature of the doradero gear means that the seabed is not impacted, while impacts to the pelagic habitat are highly likely to be imperceptible.

The information comes from the fishing gear description, observers' data, fishery logbooks data, and VMS data on where fishing occurs.

Taking into account that pelagic habitats function is mostly determined by their physico-chemical properties (Raymond, 2011), information about the fishery impact on the habitat comes from knowing the fishing methodology and from inferring logically that it does not alter the characteristics of the water column. Therefore, information is adequate to allow for identification of the main impacts of the UoAs on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. **SG60 and 80 are met.**

However, as the physical impact has not been fully quantified, SG100 is not met.

С	Monitoring			
	Guide post	Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.	
	Met?	Yes	Yes	
Ration	ale			

VMS data on the fishery spatial distribution continues to be collected though the DIRNEA (National Directorate of Aquatic Spaces).

As explained in section 3.2, there is a great seasonality in the mahy mahi fishery: it operates mainly during November-February, with peak catches in December and January, however, when there is "El Niño" event, mahi mahi's availability lasts almost all year round, but the opposite happens during "La Niña" event. Therefore, the availability of mahi mahi may be associated with the introduction from west to east of equatorial and subtropical water masses off the Peruvian and Ecuadorian coasts, mainly between November and February, when mahi mahi highest abundances are found.



During this period, the sea surface temperature (SST) related to mahi mahi fluctuated between 20 °C and 26 °C, but it was mostly associated with the 23 °C isotherm (Martínez-Ortíz & Zúñiga-Flores, 2012). Thus, the distribution of the species is related to the SST.

Fishermen have to fill the Longliner set form ("Formulario lance palangrero") every time they set their gear. In that form, among other information, they fill in the Sea Surface Temperature. All the information gathered by the fishery are analyzed by the Ministry technicians who can monitor and detect changes.

In addition, as the IATTC recognizes ecosystem issues in many of its management decisions, it aims at quantifying and evaluating the Commission's ecosystem approaches to fisheries, through current tools available to assess the state of the ecosystem (IATTC, 2019b), including the physical environment of tunas and billfishes, which is the same as mahi mahi's.

For all the abovementioned, SG80 and 100 are met.

References

Heileman, 2009 Heileman et al., 2009 IATTC, 2013 IATTC 2015; IATTC 2019b Jiménez – Santistevan (2008) Raymond, 2011

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

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

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.5.1 – Ecosystem outcome

PI	2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
а	Ecosyst	em status		
	Guide post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Yes	No	No
Rationale				

The dominant source of variability in the upper layers of the Easter Pacific Ocean (EPO) is known as the El Niño-Southern Oscillation (ENSO), an irregular fluctuation involving the entire tropical Pacific Ocean and global atmosphere. El Niño events occur at 2- to 7-year intervals, and are characterized by weaker trade winds, deeper thermoclines, and abnormally high sea-surface temperatures (SSTs) in the equatorial EPO. El Niño's opposite phase, commonly called La Niña, is characterized by stronger trade winds, shallower thermoclines, and lower SSTs. The changes in the physical and chemical environment due to ENSO have a subsequent impact on the biological productivity, feeding, and reproduction of fishes, birds, and marine mammals (IATTC, 2019b).

The key elements of the Pacific Central-American Coastal LME and the Humboldt Current LME, include abiotic and biotic factors, such as sea surface temperature, stratification, abundance of phytoplankton, zooplankton bio volume, total fish biomass, ratio of pelagic biomass to demersal biomass, size distribution of the fish community, trophic networks, abundance of predators and the availability of forage species, the capture or landings of all fisheries, the average trophic level of catches, etc.

As discussed in PI2.4.1, the assessed fishery does not impact abiotic elements, while the impacts on various key elements of the ecosystem (retained species, bycatch, threatened and protected species and habitats) have already been considered separately in previous PIs relative to 'impact' ('outcome') of P2 (2.1.1, 2.2.1, 2.3.1, 2.4.1). Other aspects of the potential impacts on the biotic elements of the ecosystem are considered below, especially in relation to the impacts that the assessed fleet may cause in the relationships and the balance between them, since the normal function of an ecosystem depends to a large extent on the relative stability that the main biotic elements maintain among themselves.

A number of key ecosystem elements might be disrupted by the fishery, including trophic relationships, size composition, biodiversity, and species distribution. The elements considered of primary importance and to be most likely threatened by the Ecuador mahi mahi longline fishery is that of trophic structure. A fishery can alter the structure and functioning of ecosystems through trophic interactions.

Like other large pelagic fishes, C. hippurus plays an important role in epipelagic ecosystems (see Figures 3.4.1.4.3 and 3.4.1.4.4), since it may delineate the structure of the food-webs by top-down controls (Varela et al., 2016).

In addition, as the Eastern Tropical Pacific Ocean shows wasp-waist-like structure (i.e., combination of top-down and bottom-up controls by a few abundant short-lived species occupying intermediate trophic levels), fisheries of top predators (such as tunas and billfishes or mahi mahi) that prey upon wasp-waist species could have implications in the pelagic system mechanisms when the biomasses of these particular functional groups are altered (Griffiths et al., 2013). The UoA fishery is usually highly selective (without taking into account 2016 catches), i.e., average of 89.87% of efficiency between 2013 and 2017 and it is considered to be sustainable. Therefore, it is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. Hence, **SG60 is met.**

However, this fishery impacts mainly on top predators and its possible top-down trophic implications, we can only be partly certain that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, hence, **SG80 is not met.**

References

Griffiths, et al., 2013.

Varela, et al., 2016

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

Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.5.2 – Ecosystem management strategy

PI 2	2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scorin	g Issue	SG 60 SG 80 SG 100		
	Manage	ment strategy in place		
а	Guide post	There are measures in place, if necessary which take into account the potential impacts of the UoA on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan , in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
	Met?	Yes	Yes	No
Rationale				

As already mentioned in PI 2.4.1, the assessed fishery does not impact abiotic elements, therefore no measures or partial strategy are required for the abiotic elements of the ecosystem.

Regarding the biotic elements of the ecosystem, Agreement 031 from October 8, 2004 states that only thin surface longline (doradero) with hook type "J" of size number 4 or 5, or circular hook of size number 14 or 15 is allowed to prevent incidental catches as much as possible.

In addition, Ecuador has specific legislation and management measures to protect sea turtles: (i) Ministerial Agreement 212 which considers all species of sea turtles in Ecuadorian territorial waters protected by the State; (ii) the National Plan for the Conservation of Sea Turtles, whose general objective is to identify the necessary actions to ensure the conservation of sea turtles in Ecuador; and (iii) the Sea Turtle Bycatch Reduction Program.

Moreover, there are national and international management measures specific to mitigate pressures on shark populations. At a national level, for example, there is the implementation of the National Action Plan for the Conservation and Management of Sharks (PAT-Ec) to conserve and manage sharks (Executive Decree 486 and 902); or the establishment of the Single Observer Program for the Longline Fleet of Ecuador (Ministerial Agreement 204), which is linked to other projects of national interest such as the National Action Plan for the Conservation and Management of the Mahi mahi (PAN Dorado), and the PAT-Ec. At a regional level, IATTC has a resolution to manage shark species (C-16-05, https://www.iattc.org/PDFFiles/Resolutions/IATTC/_English/C-16-05-Active_Management%20of%20sharks%20species.pdf).

Even though no cetaceans have been reported (not even from the observer's reports), Ministerial Agreement 196 protects cetaceans stating that all species of whales present in territorial waters are considered protected by the State; and any activity that threatens the life of these marine mammals is prohibited.

Ecuador also has (apart from the fishery catch data) a database with the biological and fishing information of each trip registered by the Ministry of Aquaculture and Fisheries observers, where among other things, by-catch species are recorded.

All this shows that there is a partial strategy which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance, thus **meeting SG80**.

However as there is not a strategy consisting of a plan containing measures to address all main impacts of the UoA on the ecosystem, **SG100 is not met.**

b Management strategy evaluation



	Guide post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	Testing supports high confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	Yes	Νο	Νο
Ration	ale			

Based on the characteristics of the fishing gear, the measures are considered likely to work. Thus, meeting SG60.

However, this fishery impacts mainly on top predators and its possible top-down trophic implications and there is a poor understanding of the potential impact on the EPO marine ecosystem. **SG80 is not met.**

	Management strategy implementation				
с	Guide post		There is some evidence that the measures/partial strategy is being implemented successfully .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).	
	Met?		Yes	Νο	
Ration	ale				

For the reasons stated in SIb, there is some evidence that the measures/partial strategy is being implemented successfully, therefore, **meeting SG80.**

However, due to the high percentage of captures of sharks and other non-target species during 2016, we cannot state that the measures/partial strategy is achieving its objective as set out in SIa. Hence, **not meeting SG100.**

Ecuadorian Executive Decree 486/2022 Ecuadorian Executive Decree 362/2022

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

Draft scoring range	60-79
Information gap indicator	Information sufficient to score PI

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

Overall Performance Indicator score	
Condition number (if relevant)	



PI 2.5.3 – Ecosystem information

PI 2	2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem			
Scorin	g Issue	SG 60 SG 80 SG 100			
	Informat	ion quality			
а	Guide post	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.		
	Met?	Yes	Yes		
Detion	ala				

Rationale

The abiotic elements of the pelagic ecosystem in the Eastern Pacific Ocean are identified and understood (see Section 3.4.1 for details).

The biotic elements considered of primary importance and to be most likely threatened by the Ecuador mahi mahi longline fishery is the trophic structure. Studies on the diet and the feeding habits of C. hippurus in the Northern Pacific Ocean, Atlantic Ocean and Mediterranean Sea (Massutí et al., 1998; Oxenford & Hunte, 1999; Castriota et al., 2007; Tripp-Valdez et al., 2015), as well as in the Pacific coast of Ecuador specifically (Varela et al., 2016) have been conducted.

Therefore, information is adequate to broadly understand the key elements of the ecosystem. Thus, meeting SG80

	Investiga	ation of UoA impacts		
b	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail .
	Met?	Yes	Yes	Yes
Ration	ale			

As mentioned in SIa, the main interactions between the UoA and the key ecosystem elements (i.e., the trophic structure) can be inferred from existing information and have been investigated in detail both in the Pacific coast of Ecuador and in other places of the world (e.g., the Northern Pacific Ocean, Atlantic Ocean and Mediterranean Sea). Therefore, **meeting SG100.**

	Understanding of component functions				
с	Guide post		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood .	
	Met?		Yes	No	
Ration	ale				

The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the pelagic ecosystem in the eastern tropical Pacific Ocean, covering the area circumscribed by 20°N, 20°S, 150°W



(i.e., Olson and Watters, 2013), and specifically in the Humboldt Current System (e.g., Moloney et al., 2005; Thiel et al., 2007) are known. Therefore, **SG80 is met.**

The impacts of the UoA on P1 target species, primary, secondary and ETP species and habitats are identified (see PI 1.2.3 for target species, 2.1.3 for primary species, 2.2.3 for secondary species, 2.3.3 for ETPs, and 2.4.3 for habitats). However, as at the IATTC detailed information on retained and discarded bycatch by the smaller purse-seine fleet and much of the longline fleet is limited (IATTC, 2019b), the impacts of the fishery are not understood well enough. Hence, **SG100 is not met.**

	Information relevance				
d	Guide post	Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.		
	Met?	Yes	Νο		
Ration	ale				

As seen in PI 1.2.3, 2.1.3, 2.2.3, 2.3.3 and 2.4.3, there is adequate information on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be understood. Hence, **SG80 is met.**

Studies on the interactions between the UoA and specific ecosystem elements (i.e. mahi mahi, sharks, seaturtles) have been conducted (Largacha et al. 2005; Hall, 2007; Read, 2007; Mug et al., 2008; Andraka et al., 2013; MAE, 2014; Martínez–Ortíz et al., 2016; Varela et al., 2016). In addition, a model hypothesis of the eastern tropical Pacific Ocean pelagic ecosystem to gain insight into the relationships among the various species has also been carried out.

However, as detailed information on retained and discarded bycatch by the smaller purse-seine fleet and much of the longline fleet is limited (IATTC, 2019b), the information on the impacts of the UoA on the components and elements is not adequate to allow all the main consequences for the ecosystem to be inferred. Therefore, **SG100 is not met.**

e	Monitoring						
	Guide post	Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.				
	Met?	Yes / No	Yes / No				
Dation							

Rationale

Biological and environmental information is being monitored by the IATTC in the area. As already explained in previous PIs (see PIs 1.2.3, 2.1.3, 2.2.3, 2.3.3, and 2.4.3), the information collected includes catches, incidental interactions and their fate, VMS, SST, type of bait. The data are sent to the Ministry of Aquaculture and Fisheries but also to the IATTC for further analyses. Therefore, **SG80 is met.**

There is probably adequate information to support the development of a strategy to manage ecosystem impacts, but since there is not a specific strategy to manage the ecosystem impacts of the mahi mahi fishery, **SG100 is not met.**

References

Andraka et al., 2013 Castriota et al., 2007; Hall, 2007 Largacha et al. 2005 MAE, 2014 Martínez–Ortíz et al., 2016



Massutí et al., 1998; Mug et al., 2008 Oxenford & Hunte, 1999; Tripp-Valdez et al., 2015 Varela et al., 2016

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

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

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

Overall Performance Indicator score	
Condition number (if relevant)	



7.3.3 Principle 2 references

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7.4 Principle 3

7.4.1 Principle 3 background

The jurisdictional categories that apply in this assessment for the target species are straddling stocks ('SSS') and highly migratory species ('HMS') and, therefore, it is a UoA subject to international cooperation to manage the target stock. Despite being a pelagic resource considered as transzonal and/or highly migratory, up to now IATTC has not adopted specific management measures for mahi-mahi, unlike fisheries directed at tunas and tuna-like species. However, mahi-mahi is targeted by longline fleets and caught incidentally by purse seine fleets fishing in waters managed by the IATTC.

According to FAO, Peru and Ecuador are the two main countries catching this species in the indicated area. Peru landed almost 48% of the world dolphinfish landings in 2014, while Ecuador accounted for 10%. Therefore, it is necessary for this evaluation to consider both the elements of the management system of Ecuador and those of Peru.

The table below shows the IATTC data for dolphinfish catches in Peru and Ecuador from 2011 to 2021. The fishing gears reported are purse seine and longline. The table shows that from 2011 to 2013 Ecuador accounted for about 33-38% of the total catches. While from 2014 onwards, Peruvian catches account for 94-96% of the total catches. However, catches reported by Peru in 2020 and 2021 are anomalous, probably due to COVID 19.

 Table 7.4.1.1.
 Annual dolphinfish landings (in t) in Peru and Ecuador. Table elaborated by the team based the IATTC public domain database: EPO total estimated catch by year, flag, gear, species

	Tons per year										
Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Ecuador	10982	15786	10410	1281	799	630	865	789	620	2096	1841
Peru	20640	25752	21250	18886	16672	12727	14640	15112	14014	9	

7.4.1.2 Regulatory framework applicable to the assessed fishery

Ecuador

I.

Ecuador's Constitution of 2008 provides the legal foundations for the management of its fisheries. Article 14 declares as a public interest the preservation of the environment and the conservation of ecosystems. Article 395 declares "The State will ensure a sustainable model of development, environmentally balanced and respectful of cultural diversity, which preserves biodiversity and the natural regeneration of ecosystems, and ensures that the needs of present and future generations are met." This article together with article 396 also gives effect to the precautionary approach in natural resource management. Article 281 states: "Food sovereignty constitutes a strategic objective and an obligation of the state to ensure that individuals, communities, peoples, and nationalities achieve the self-sufficiency of healthy and culturally appropriate foods on a permanent basis.

The Organic Law for the Development of Aquaculture and Fisheries (*Ley Orgánica para el Desarrollo de la Acuicultura y Pesca, Registro*- LODAP) approved by Official Register No. 187 on *April 21, 2020*, constitutes the overarching legal framework to establish the legal regime for the development of aquaculture and fishing activities in all their phases of extraction, harvesting, reproduction, breeding, cultivation, cultivation, processing, storage, distribution, internal and external commercialization, and related activities such as the promotion of the production of healthy food; the protection, conservation, research, exploitation and use of hydrobiological resources and their ecosystems, through the application of the ecosystemic fishing approach in such a way as to achieve sustainable and sustainable development that guarantees access to food, in harmony with the principles and rights established in the Constitution of the Republic, and respecting traditional and ancestral knowledge and forms of production.

The General Regulation of the Organic Law for the Development of Aquaculture and Fisheries (*Reglamento General a la Ley Orgánica para el desarrollo de la acuicultura y pesca*) approved by the Executive Decree N^o 362, on February 25, 2022, provides the guidelines for compliance and correct application of the LODAP in the country, which has as its governing body the Advisory Council on Aquaculture and Fisheries (see Section 7.4.1.3), as an instance of non-binding technical advice, responsible for the monitoring, surveillance and evaluation of public policies in aquaculture and fisheries, as well as promoting and encouraging dialogue between public and private actors in matters of competence. The General regulation also considers the implementation of roundtable dialogues, as an instrument of information sharing and participatory decision making.

The most relevant Ecuadorian regulations applicable to the assessed fishery are listed below:

Technical measures

Ministerial Agreement No. 407 of October 12, 2011. (Defines guidelines established for mother-ships vessels).



Ministerial Agreement No. 070 of May 19, 2011. (Establishes the closed season, permissibility limits during the closed season, minimum size, among other management measures).

Action Plan

• National Action Plan for the Conservation and Management of the Dolphinfish Resource in Ecuador (PAN Dorado, *Plan de Acción Nacional para la Conservación y el Manejo del Recurso Dorado en Ecuador*). No. MPCEIP-SRP-2021-0145-A

The Ministerial Agreement No. 023 of February 14, 2011, established the NAP 2011-2016 as a tool that provided guidelines for the conservation, management and eco-certification of Dolphinfish. The design of National Action Plan (hereinafter "**PAN Dorado**") was made through a participatory process with active participation of following organizations: FENACOPEC⁹, WWF, ASOEXPEBLA¹⁰, IPIAP¹¹, IATTC, EPESPO¹², 16 artisanal fishermen's cooperatives and 1 artisanal fishing association. The participatory process included national workshops and consultation meetings. During the participatory process the group identified issues related to Dolphinfish fishery, established objectives for the fishery and structured the following lines of action: i) Management, governance and financial sustainability, ii) Control and surveillance, iii) Education, capacity building and communication, iv) monitoring and research and v) Reduction of bycatch.

To achieve the objectives of the PAN Dorado, several Ministerial Agreements related with direct management measures were implemented, such as establishing minimum sizes, closed seasons, characteristics of fishing gear and authorised vessels and implementing an observer program. Concerning the decision-making system, an Advisory Council of the dolphinfish (*Consejo Consultivo del Recurso Dorado* - CCRD) was created. The Advisory Council was created within the framework of the General Regulations of the Advisory Councils of the Ministry of Agriculture and Livestock (Executive Decree No. 3609, March 20, 2003), which establishes the guidelines for the operation and competence of the Advisory Councils. It establishes that these are spaces for dialogue and instruments of consultation and agreement between the public and private sectors. It also states that Advisory Councils must be created by Ministerial Agreements and must be renewed annually. In addition, Executive Decree No. 3609 states among its objectives to advise the fishing sector in reaching internal agreements that make viable and increase the efficiency of the relations between the different actors of the productive chain. However, the LODAP and its general regulation (approved in February 2022) established that the spaces for dialogue and participation for the NAPs must be provided through roundtables dialogue.

Between March 2012 and March 2013, two international workshops were organized to evaluate the PAN Dorado, the results of these evaluations led to an update of **PAN Dorado (2013 version)**. The main changes were the establishment of a budget to implement the actions of the 5 objectives and a restructure of the action plan grid where the entities responsible for each activity where eliminated, therefore the SRP was responsible for all the activities in the action plan (WWF, 2019).

After the evaluation of 2013, no other evaluation was implemented until 2019 where the implementation of the NAP 2011-2016 was assessed and renewed for the period 2019-2024. The PAN Dorado was officially approved by the SPR with agreement **No. MPCEIP-SRP-2021-0145-A** in June 2021. The renewal process included a participatory process to set the goals and lines of action. The main goal of the current PAN Dorado is to ensure the conservation and sustainable use of dolphinfish resource, through the following components: i) management, government and financial sustainability, ii) monitoring, control and surveillance, iii) education, capacity building and communication, and iv) research and development.

Monitoring, Control and Surveillance system

The LODAP establishes technical measures to ensure the control and traceability of fishery products, including fish products authorities involved directly and indirectly in fishing. Moreover, it establishes technological mechanisms that allow sharing of information between the different management bodies.

According to the LODAP monitoring, control and surveillance (MCS) activities must be carried out in all places where fishing and related activities are developed and throughout all the phases of the productive chain of the fishing activity. The Ecuadorian Fisheries Authority must have free access to the facilities, vessels, docks and any other premises where the activity is carried out and must have access to the information required for the fulfillment of its attributions.

⁹ National Federation of Fishing Cooperatives from Ecuador (Federación Nacional de Cooperativas Pesqueras del Ecuador-FENACOPEC)

¹⁰ White Fish Exporters Association (Asociación de Exportadores de Pesca Blanca – ASOEXPEBLA)

¹¹ Public Institute of research of Aquaculture and fisheries (Instituto Público de Investigación de Acuicultura y Pesca -IPIAP)

¹² Eastern Pacific Fisheries School (Escuela de Pesca del Pacífico Oriental-EPESPO)

To ensure the MCS of fishing activities, the LODAP establishes diverse mechanisms such as:

- The implementation of MCS systems.
- Inspections of ports and vessels.
- Technical reports from government institutions such as the IPIAP, on-board observers and the Satellite Monitoring Center (Centro de Monitoreo Satelital- CMS).
- Fishing logbook, image recording system and a weighing system.

Moreover, to track, identify and localize industrial and artisanal fishing vessels must have a tracking device that has to be authorized by the National Defense entity, the information about the location of the vessels is managed by the Administration of the Monitoring Center (*Administración del Centro de Monitoreo*). The Administration of the Monitoring Center can share the tracking information with the IPIAP (see 7.4.1.4.) so they can identify and establish the fishing areas of the artisanal and industrial fleets.

Additionally, the **Agreement MPCEIP-SRP-2022-0150-A** approved on July 13, 2022, establishes the installation and operation of the Satellite Monitoring Device (*Dispositivo de Monitoreo Satelital* - DMS) for all industrial fishing vessels and mother-ship vessels, regardless of gross registered tonnage (TRB).

The fishing logbook can be physical or electronic, in all cases, it shall be filled out daily in a complete, reliable, and timely manner, to be delivered at the time of landing or completion of fishing operations. The logbook must have the general data of the vessel, information of departure and arrival, fishing gear, geographic location, start and end time of each fishing set, estimated catches by species or group of species in tons, kilograms or number of specimens, discard and bycatch, a report of mammals and marine mammals, reptiles, penguins and seabirds with which they have interacted during the fishing operations (LODAP, article No. 162 and General Regulation, article No.225)

The Ministerial Agreement No. 204 passed in 2011 set a mandatory observer program for all mothership vessels over 20 meters in length targeting large pelagics with surface longlines. The minimum observer coverage was set as 10% of fishing trips performed by the mothership vessels. In 2021 the Observer Program was updated with the **Agreement MPCEIP- SRP- 2021-0208-A** approved on September 22, 2021, establishing that this Program must provide a system for random monitoring and real-time data collection on the fishing trips made by fishing vessels using drifting longlines, as well as the fleet of mother-ship vessels. The monitoring will increase progressively, with 10% of trips being observed in 2022, 15% in 2023 and 20% in 2024.

On May 06, 2019, IPIAP suggested that the Fisheries Observer Programs should registrate information about vulnerable species, to collect information on the interaction of marine mammals in the different fisheries of Ecuador and to comply with the requirements of international organizations (Statement No. INP- INP-2019-0289-OF). The SRP with MPCEIP-SRP-2019-0402-M of May 14, 2019, considers IPIAP's suggestion and establishes that observer programs must collect information on interaction with marine mammals.

The actions of the Monitoring, Control and Surveillance System (MCS) in the ports and landing sites are carried out continuously by the Fisheries Control Directorate (DCP) inspectors, with special emphasis during closed fishing seasons. According to the NAP assessment the most frequent ports of discharge are Esmeralda, Manta, Muisne, Santa Rosa and Anconcito. However, official information on the ports and beaches authorized for unloading should be collected at the site visit. All in situ procedures related to the MCS of fishery resources are applied at the national level, to maintain proper traceability of resources, in addition to strengthening the fight against IUU fishing.

After inspection, the inspectors from the DCP issue the Certificate of Monitoring and Control of Fisheries Landing (CMCDP), This document is essential for the necessary legalization of the catches, and its issuance must be prior to any transport by land. To obtain the CMCDP the inspectors shall require the following documents to the skipper: a) The landing declaration; b) The fishing log, if applicable; c) The ministerial agreement, if applicable; and d) The vessel's fishing permit, set sail, and other permits or documents as appropriate and applicable to the vessel. (Article 238, LODAP)

Further details on the implementation of these regulations are given in section 7.4.1.7.

II. Perú

Peru's Political Constitution declares on articles 66 and 68, that the Peruvian State must promote the conservation and sustainable use of biological diversity. Moreover, the General Fisheries Law (*Ley General de Pesca*), approved on December 22, 1992, by Decree Law No. 25977 states that fishery resources and fisheries management must be handled in a responsible and sustainable manner. Article No. 9 declares that the Ministry of Production, based on socioeconomic factors and scientific evidence, determines for each fishery a management system, the fishing quotas, the season and



the fishing grounds, the regulation of the fishing effort, determines the fishing methods, and other regulations to ensure the preservation and sustainable use of the hydrobiological resources.

The Regulations of the General Fisheries Law (*Reglamento de la Ley General de Pesca*), approved by Supreme Decree No. 012-2001-PE, on March 13, 2001 and amended by Supreme Decree No. 018-2020-PRODUCE, on September 24, 2020, establishes in the article 2, that PRODUCE must ensure a balance between the sustainable use of hydrobiological resources, environmental conservation and socio-economic development, in accordance with the principles and norms of the Political Constitution of Peru, the Organic Law for the Sustainable Use of Natural Resources, the General Fisheries Law, the Framework Law of the National Environmental Management System, the Regulations of the Framework Law of the National Environmental Management System and the General Environmental Law.

Technical measures:

- **Ministerial Resolution No. 249-2011-PRODUCE** of September 2, 2011, establishes the minimum catch sizes and maximum tolerance of juveniles' specimens for the extraction of various marine species, among them is considered the dolphinfish. The legal regulation states that the minimum catch size is 70 cm fork length and the maximum tolerance of juveniles to be extracted is 10%.
- Ministerial Resolution No. 245-2014-PRODUCE of July 11, 2014, the dolphinfish fishing season was established at the national level from October 1 to April 30 and the closed season from May 1 to September 30 of each year, respectively.

Management Plan

- National Action Plan for the Conservation and Management of the Dolphinfish Resource in Peru (PAN-Perico) The PAN Perico was approved on June 30, 2016, by Vice-Ministerial Resolution No. 081-2016-PRODUCE/DVPA, it aims to ensure a sustainable management of Dolphinfish fishery, establishing objectives and activities in the medium and long-term. The objectives are related with biological and ecological research of dolphinfish, implementation of monitoring, evaluation and surveillance system; strengthen the regulatory framework and the management measures, education and technical assistance and establishing mechanisms to reduce the bycatch of dolphinfish. Furthermore, as part of the actions to achieve de objective of "strengthen the regulatory framework and the management measures", the PAN Perico establishes the creation of the Fisheries Management Regulation of Dolphinfish.
- Fisheries Management Regulation of Dolphinfish (*Reglamento de Ordenamiento Pesquero del Recurso Perico Perico ROP Perico*) approved by Supreme Decree No. 017-2021-PRODUCE on July 27, 2021. The aim of the ROP Perico is to establish fishing management standards for the conservation of the dolphinfish resource and to ensure the sustainable development of fishing activities. The main objectives are to regulate the fishing effort and establish the conditions of access to the fishery, adopt measures for the conservation of the resource based on evidence and the establishment of control measures, monitoring and surveillance.

Monitoring, Control and Surveillance

The Monitoring, Control and Surveillance (MCS) system is equipped with different control tools, such as port inspectors, Closed Circuit TV (CCTV) systems in the landing sites, and a Satellite Monitoring System for Fishing Vessels (SISESAT), approved by Supreme Decree No. 001-2014-PRODUCE. The Supreme Decree was amended by Resolution No. 433-2019-PRODUCE, where the technical specifications of SISESAT were determined. Furthermore, the ROP Perico establishes that vessels engaged in this fishery must implement SISESAT progressively.

The ROP Perico includes severe penalties in case of infringements related with good handling and release practices of turtles, seabirds and other ETP species. Vessels without a trained crew member in good handling and release practices, or vessels that do not have the necessary devices for implementing good releasing practices will receive a penalty and will be sanctioned with a monetary fine.

Additionally, the ROP Perico states that the fishing vessel owners must fill out a fishing logbook that can be physical or electronic. The logbook for dolphinfish will be elaborated by IMARPE. The physical logbook must be handed to IMARPE staff or to an accredited member of the DGSFS in the landing site. The electronic logbook must be delivered to IMARPE following IMARPEs protocols.

According to the ROP Perico (article 16, scientific observation on board) IMARPE, based on the number of fishing vessels engaged in dolphinfish fishing, will randomly select a number of vessels for scientific observation on board. The



owner of the selected vessel must embark the scientific observer and provide food, facilities, and safety measures for the development of their work. IMARPE can also coordinate with the owner of the vessel the use of technology to replace the observer, but in this case IMARPE must provide the technical specifications. Additionally, IMARPE may request that dolphinfish fishermen to provide geo-referenced biological samples.

Moreover, PMA, WWF and the artisanal fishermen, are implementing a pilot program for electronic monitoring in 9 vessels distributed across the Peruvian coast. The Remote Electronic Monitoring (REM) is a camera-based system that captures images periodically and has the technology to identify species and measure the size of target species.

III. International level

Bilateral Cooperation

Ecuador and Peru signed in 2014 a Memorandum of Understanding (MoU) on Fisheries and Aquaculture between the Ministry of Production of the Republic of Peru and the Ministry of Agriculture, Livestock, Aquaculture and Fisheries of the Republic of Ecuador, which still in force today. Under this framework MPCEIP and PRODUCE and their research institutes (IPIAP and IMARPE, respectively) are coordinating to ensure the sustainability of the dolphinfish.

IATTC

The Republic of Ecuador has been a Contracting Party to the Inter-American Tropical Tuna Commission (IATTC) since 2004, having ratified its membership in May 2021; as well as to the Agreement on the International Dolphin Conservation Program (AIDCP), organizations whose fundamental objective is the conservation and management that ensures the long-term sustainability of tuna stocks and other marine resources associated with the tuna fishery in the Eastern Pacific Ocean (EPO).

On the other hand, Peru has been a Contracting Party of the IATTC since 2003, having ratified its membership in October 2018. (Legislative Resolution No. 30785).

7.4.1.3 Entities and institutions involved in the management of the assessed fishery

I. Ecuador

Ministry of Production, Exterior, Investment and Fisheries (Ministerio de Producción, Comercio Exterior, Inversiones y Pesca - MPCEIP)

Throughout the past years, fisheries administration in Ecuador had significant changes. In May 2017 by Executive Decree No. 6 the Vice-Ministry of Aquaculture and Fisheries was separated from the Ministry of Agriculture, Livestock, Aquaculture and Fisheries to create the Ministry of Aquaculture and Fisheries. Nevertheless, in 2018, by Executive Decree No. 559 the Ministry of Aquaculture and Fisheries was merged with the Ministry of Foreign Trade and Investment, Ministry of Industry and Productivity and the Institute for the Promotion of Exports and Foreign Investment creating the current Ministry of Production, Exterior, Investment and Fisheries (MPCEIP, by its Spanish initials). On January 11th, 2019, the Executive Decree No. 636 created the Vice Ministry of Aquaculture and Fisheries. See Figure 7.4.1.3.1.





Figure 7.4.1.3.1 Extract of the MPCEIP Organisation chart. Source: https://www.produccion.gob.ec/wpcontent/uploads/2021/06/Estructura_mpceip-Mz-2021-01-scaled.jpg

The Vice Ministry of Aquaculture and Fisheries (Viceministerio de acuicultura y pesca). The Vice Ministry regulates, promotes and manages the use of fishing and aquaculture activities, based on policies, strategies, standards and technical and legal instrumentation for this purpose. The Vice Ministry must issue regulations, agreements and resolutions related to the direction and control of aquaculture activity in the country as well as to coordinate with public and private entities for the development of aquaculture and fishing activities. The most relevant Secretariats and Directorates for the assessed fishery are listed below:

- Under Secretariat for quality and safety (Subsecretaría de Calidad e Inocuidad SCI). SCI manages
 regulatory processes of safety regulation, monitoring and certification related with the quality and safety of
 hydrobiological products, through the implementation of systems, standards, and regulations to guarantee the
 quality of the production chain of bio aquatic products.
- Fisheries and Aquaculture Policies Directorate (Dirección de Política Pesquera y Acuícola DPPA). DPPA oversees the design, proposal and evaluation of management regulations, plans, programs, national and international cooperation agreements to regulate and promote the activities related to fisheries and aquaculture. In order to guarantee the sustainable and responsible use of resources in all their phases, the DPPA uses scientific instruments and information.
- Under Secretariat for Fishery Resources (Subsecretaría de Recursos Pesqueros SRP). Is responsible for the supervision and implementation of the of the national fisheries policy, guarantees compliance with fisheries laws and regulations, elaborates fisheries development plans and programs, coordinates the activities of the public and private sectors, manages fisheries financial credit, endorse reports and plans of companies in the fisheries sector, and commissions studies on the activity, management, and development of the fishing sector. Moreover, the SRP establishes actions to prevent, deter and eliminate illegal unreported and unregulated fishing Additionally, SRP represents Ecuador in international meetings including the IATTC. The SRP is composed of the following Divisions:
 - Fisheries Control Directorate (Dirección de Control Pesquero DCP). DCP is an affiliate of SRP. Controls fishing activities implementing monitoring, surveillance and inspection processes, to ensure the protection, conservation and sustainable use of hydrobiological resources. The DCP must execute traceability plans and programs and provide technical information regarding traceability. Carries out confiscations and destruction of fishery products and nets if regulations are not complied. Also, provides knowledge transfer related to fisheries legislation. The DCP has for units: Control and Surveillance, Satellite Surveillance, Observation and Supervision and, processing, and analysis.
 - Artisanal Fisheries Directorate (Dirección de Pesca Artesanal DPA). Suggests and executes plans, programs and projects to strengthen the value chain of artisanal fishing activity, provides technical assistance considering regularization strategies, formalization, production and marketing alternatives to improve the technical and micro-entrepreneurial capacities of fishing actors and their families, contributing to the development of the artisanal fishing sector. Issues permits for artisanal



fishermen and artisanal vessels, provides capacity building in sustainable fisheries, enterprises, technologies associated with the production, transformation and processing. Provides legal advice and technical support, in the management to obtain the legal personality of artisanal fishing organizations in order to promote associativity in the fishing sector.

• **Industrial Fisheries Division (Dirección de Pesca Industrial - DPI).** Regulates industrial fishing activity issuing permits, providing technical information, the legalization of fish catch and ensuring the traceability of fishery products and compliance with regulations for internal and external marketing.

• National Directorate of Aquatic Spaces (Dirección Nacional de los Espacios Acuáticos - DIRNEA)

In May 2008, with executive decree No. 1111 the National Directorate of Aquatic Spaces was established as part of the General Navy Command (*Comandancia General de Marina*) and depends on the Ministry of Defence. The DIRNEA is the national maritime authority in aquatic spaces and is responsible for on-the water fisheries enforcement and for satellite monitoring that it carries out in coordination with SRP.

Advisory Council of Aquaculture and Fisheries (Consejo Consultivo de Acuicultura y Pesca)

Created by the LODAP 2020, is the non-binding technical advisory body, responsible for monitoring, overseeing and evaluating public policies on aquaculture and fisheries, as well as promoting and promoting dialogue between public and private actors in matters of competition. The Advisory Council shall be chaired by the governing body for national aquaculture and fisheries policy. The Advisory Council is comprised by government officials and representatives of producer organizations, aquaculturists, fishermen, marketers, economic agents, and related representatives.

Advisory Council of the dolphinfish (Consejo Consultivo del Recurso Dorado- CCRD)

The **Ministerial Agreement No. 055**, approved on April 16, 2011, established the CCRD, as an instrument of consultation between the public and private sectors, related to the conservation, management, sustainable use and eco certification of dolphinfish. The conformation of the CCRD included the SRP as the president of the CCRD, the FENACOPEC and ASOEXPEBLA as representatives of the fisheries sector, WWF and INP as advisors and other relevant stakeholders could participate on specific session if the council considered necessary. However, the CCRD never established statutes or scheduled activities. (WWF, 2019).

II. Perú

The General Fisheries Law and its Regulations in force since January 1994, establish the legal framework for fishing activity in Peru. The regulation defines mechanisms for the management and extraction of fishing resources in waters under Peruvian jurisdiction and differentiate access for industrial and artisanal fishing and provides a legal framework for the management of any fishery.

The Ministry of Production (Ministerio de la Producción – PRODUCE) has exclusive competence in fisheries and aquaculture management, industrial fisheries at the national level, ensuring that the development of these activities is carried out in harmony with the protection of the environment and the conservation of biodiversity. Additionally, according with the Regulations of the General Fisheries Law (numeral 3.3 of Article 3) PRODUCE has shared competences with regional governments and local governments in matters of artisanal fisheries.

The Vice-Ministerial Office of Fisheries and Aquaculture (Despacho Viceministerial de Pesca y Acuicultura-DVMPA) is the authority in charge of fisheries and aquaculture management at the national and sectoral level, ensuring a sustainable use of hydrobiological resources. The most relevant Directorates for the assessed fishery are listed below:

- General Directorate of Fisheries and Aquaculture Policy and Regulatory Analysis (Dirección General de Políticas y Análisis Regulatorio en Pesca y Acuicultura- DGPARPA) Is responsible for formulating and proposing national and sectoral policies, national plans, standards, guidelines and strategies for fisheries and aquaculture, as well as monitoring their implementation, ensuring the sustainable use of hydrobiological resources.
- General Directorate of Supervision, Control and Sanctions (Dirección General de Supervisión, Fiscalización y Sanción- DGSFS) The DGSFS is the line body, with technical authority at the national level, responsible for the supervision, oversight and control of compliance with fishing and aquaculture regulations



and the provisions of the enabling titles granted in these matters; it is also in charge of managing and supervising the administrative sanctioning procedure in the first administrative instance.

 General Directorate of Artisanal fisheries (Dirección General de Pesca Artesanal – DGPA) is the technical area responsible for promoting and implementing, within the framework of national and sectoral policy, management, formalization and productive innovation measures for the development of artisanal fishing and sport fishing activities, as well as for the business management of artisanal fishing infrastructure, ensuring the sustainable use of hydrobiological resources.

III. Inter-American Tropical Tuna Commission (IATTC)

The **IATTC** is the regional fisheries management organization (RFMO) responsible for the conservation and management of tuna and tuna -like species, associated species and their ecosystems, throughout the Eastern Pacific Ocean, from Canada, in the north, to Chile, in the South¹³.

The organization of the IATTC (see Figure 7.4.1.3.2) includes research and management, having its own scientific staff, headed by a Coordinator of Scientific Research, which provides advice regarding fisheries management, data collection and research to the Scientific Advisory Committee (SAC) and the Commission, as well as assistance and capacity building to its developing members. In addition to a number of field offices in several countries, the Commission has its own research laboratory at Achotines, in Panama¹⁴.



Figure 7.4.1.3.2 IATTC Organigram. Source: https://www.iattc.org/en-US/About/Role#organigram

The Working Group on Bycatch has been replaced by the Permanent Working Group on Ecosystem and Bycatch (EBWG) that was formally created in 2022 through the adoption of Resolution C-22-06, and its first meeting is expected for May 2023. Among the objectives of this WG is to evaluate and recommend measures and best practices to avoid, reduce and minimize catch and mortality of non-target species, effective methods for safe handling practices and release of non-target species, and the effects of fishing on endangered species. This permanent WG replaces the previous WG on Bycatch (BYC) which had been meeting regularly in recent years.

The IATTC does not consider the dolphinfish as a target species under its scope, it considers it only as bycatch. However, the dolphinfish fleet is affected by IATTC regulations for bycatch, observers, turtles, sharks, among others, since the fleet that catches dolphinfish, in many cases, also target species under the purview of the IATTC.

7.4.1.4 Institutions or bodies for fisheries research and NGOs

I. Ecuador



¹³ Role and characteristics | IATTC

¹⁴ Idem.

Public Institute of research of Aquaculture and fisheries (Instituto Público de Investigación de Acuicultura y Pesca -IPIAP)

The IPIAP was created on December 5th, 1960, it has its own legal structure, patrimony and financing resources and is ascribed to the Ministry of Production, Exterior, Investment and Fisheries. The IPIAP aims to provide information and scientific-technological knowledge to guarantee the rational use of hydrobiological resources and their ecosystems, providing management and conservation measures to the competent authorities, contributing with the sustainable development of the fishing and aquaculture sector.

World Wildlife Fund Ecuador (WWF- Ecuador).

WWF works to help local communities conserve the natural resources they depend upon; transform markets and policies toward sustainability; and protect and restore species and their habitats. WWF-Ecuador worked with ASOEXPEBLA and the SRP to promote a sustainable dolphinfish fishery. WWF contributed to the analysis and update of the PAN Dorado as well as the implementation of the FIP of the dolphinfish.

II. Perú

Peruvian Ocean Institute (Instituto del Mar del Perú- IMARPE)

Specialized technical agency of the Ministry of Production that oversees scientific research in fisheries aquaculture to provide advice to safeguard the sustainable use of marine and continental resources and ecosystems. IMARPE provides scientific information to PRODUCE for accurate decision-making and for the elaboration of regulations related to fisheries.

National Fisheries Development Fund (Fondo Nacional de Desarrollo Pesquero -FONDEPES)

The aim of FONDEPES is to promote, execute and provide technical, economic and financial support for the development of maritime and continental artisanal fishing activities, through the provision of basic infrastructure for the development and distribution of hydrobiological resources, strengthening the capacities of regional and local governments, artisanal fishermen and fish farmers, as well as generating and providing incentives in accordance with the laws and regulations in force.

World Wildlife Fund Ecuador (WWF- Perú)

WWF-Peru has been working with Peru Mahi Alliance, IMARPE, PRODUCE and artisanal fishermen to contribute to sustainable fishing of the dolphinfish resource. WWF has promoted compliance with the FIP Perico, working on research on the resource, promoting the improvement of the governance of the fishery and promoting the formalization process of artisanal fishermen. They have also been working on capacity building for good sea turtle release practices and are promoting the creation of an app for the traceability of the resource.

III. Bilateral cooperation

Peru and Ecuador are cooperating at an institutional level in the management of the Dolphinfish resource. A Framework Agreement for Technical Cooperation between the IMARPE and the IPIAP was signed on October 30, 2014 and was automatically renewed after five years. Under this agreement, six binational workshops and six virtual workshops for the exchange of experiences on Dolphinfish resource have been held between Ecuador's IPIAP and Peru's IMARPE (2015, 2016, 2017, 2018, 2019, 2020, 2021). The aim of the binational workshops was to standardize the methodology for the collection of information from biological-fishing studies. The exchange of information between countries enabled to update data related to the geographical distribution and other biological aspects associated to Dolphinfish resource. Furthermore, the binational workshops enabled the coordination of a joint stock assessment completed in 2021 which also includes management advice (Roa-Ureta et al. 2022) and the elaboration of joint study on the genomic characterization of the dolphinfish. These workshops were led by the research institutes from Ecuador and Peru (IPIAP and IMARPE, respectively) and several workshops had the participation of MPCEIP and PRODUCE. During 2021 six virtual workshops for the exchange of experiences were held with the objective of strengthening capacities and exchanging management experiences between the two countries. These virtual workshops addressed the following topics: management, access to the resource, control and surveillance, health and safety, processing and infrastructure, and port management. In order to continue generating information on the status of the stock of dorado in the South Pacific by the year 2022, IMARPE and the IPIAP presented a stock assessment and genomic study for dorado at the 13th meeting of the Scientific Advisory Committee (SAC) of the IATTC. However, it is important to mention that this study was not carried out directly by the SAC of the Inter-American Tropical Tuna Commission (IATTC).



IV. IATTC

The IATTC has its own scientific staff headed by a Coordinator of Scientific Research that provides scientific information to the SAC (see 7.4.1.4.3).

Although it is not a tuna species, in June 2012, during the 83rd Annual Meeting of the IATTC, the parties agreed that the Commission's scientific staff should begin the stock assessment of the dolphinfish resource, in the Convention area.

During the Fifth Meeting of the IATTC Scientific Advisory Committee (SAC), held on 12-16 May 2014 in La Joya, it was considered appropriate for the IATTC staff to study this species in order to determine the impact of the fishing activity and recommend appropriate conservation measures if necessary.

In this context, the IATTC organized the First Technical Meeting on Dorado on October 14- 16, 2014, in Manta, Ecuador, with the objectives of promoting regional research on the Dolphinfish in the EPO; reviewing its status in relation to the knowledge that was available on the species and identifying the scientific data available on it and formulating a plan for future research.

In 2015, the 2nd Technical Meeting worked on defining the assumptions about stock structure and identifying potential indicators of stock status for the dorado in the eastern Pacific Ocean. The 3rd Meeting, held in 2016, worked on the evaluation of data requirements and assessment methods for data-restricted to dolphinfish fisheries in the eastern Pacific Ocean. Moreover, the SAC was involved in the exploratory stock assessment that was submitted to the 7th meeting of the SAC held in May 2016.

As a result, the SAC got involved and an exploratory stock assessment for the dolphinfish in the SE Pacific Ocean was elaborated and submitted to the 7th meeting of the SAC held in May 2016. As far as the team is aware, the SAC did not continue to work on the monitoring or assessment of this species, and the work was taken over by the national research institutions of Ecuador and Peru (IPIAP and IMARPE, respectively). The joint assessment was submitted to the 13th meeting of the SAC held in May 2022, but only as an informative document.

V. South Pacific Regional Fisheries Management Organisation (SPRFMO)

Ecuador and Peru are members of the SPRFMO. The South Pacific Regional Fisheries Management Organisation is an inter-governmental organisation aims for the conservation and sustainable use of the fishery resources of the South Pacific Ocean. One of the main commercial resources fished by is jumbo flying squid in the Southeast Pacific, species that is important for the dolphinfish fishery because the main species for the bait is the Jumbo flying squid. RMFO issued in 2020 a Conservation and Management Measure (CMM) on the Management of the Jumbo flying squid (CMM 18-2020)..

7.4.1.5 Institutions of the fishing, trading and processing industry

I. Ecuador

- White Fish Exporters Association (Asociación de Exportadores de Pesca Blanca ASOEXPEBLA) Represents the white fish exporting companies, their main supplier of dolphinfish is the industrial fleet.
- National Federation of Fishing Cooperatives from Ecuador (Federación Nacional de Cooperativas Pesqueras del Ecuador-FENACOPEC). Represents the artisanal fleet of fiberglass skiffs dedicated to Dolphinfish fisheries.
- Asociación de Producción Pesquera de Armadores de Manta (ASOMAN) represents fiberglass skiffs and mother-ship vessels dedicated to Dolphinfish fisheries. Currently ASOMAN has a cooperation agreement with the Universidad Laica "Eloy Alfaro" of Manabí (ULEAM). As part of the agreement, ULEAM will support the implementation of activities of the Responsible Longline Dolphinfish Fishery Improvement Project (FIP-DPR)
- Conservation Mahi-Mahi: represents five dolphinfish processing companies and a group of artisanal and industrial fishermen dedicated to this fishery as members. Conservation Mahi-Mahi has been executing a fishery improvement project (FIP) for the Ecuadorian longline dolphinfish fishery and started the process of formal evaluation under the sustainable fisheries standard of the Marine Stewardship Council.

II. Perú

Dolphinfish are caught by artisanal fishermen. According to the 2012 National Census of Artisanal Fishing of the Maritime Sector 2012, the dolphinfish constitutes the third species with the third largest number of vessels of vessels dedicated to its capture, with a total of 2,153 vessels (13.4% of the total number of vessels surveyed) of the total number



of vessels surveyed). Piura was the region with the highest number of vessels dedicated to the extraction of the resource, with a total of 2153 vessels of vessels dedicated to the extraction of dolphinfish. Nevertheless, a new census is required to update the information of the artisanal fleet. Most fishermen are organized in fishing organizations there are 1755 officially registered¹⁵ The following are some of the artisanal fishermen's associations involved in dolphinfish fishing that provided input and comments to the Perico ROP:

- FIUPAP: Federación de Integración y Unificación de los Pescadores Artesanales del Perú
- APAMARPA: Asociación de Pescadores Artesanales Mar de Paita.
- AAARCUDIPA: Asociación de Armadores Artesanales para el Consumo Humano del Puerto de Paita
- APADEXPO: Asociación de Pescadores Artesanales dedicados a la extracción de pota, perico y otros. Parachique-La Bocana.

In addition to the artisanal fishing organizations, there are three fishing cooperatives participating in the pilot programs under the formalization process provided for in DS 006-2016-PRODUCE. These cooperatives are mainly engaged in the giant squid and dolphinfish fisheries, and are the following:

In the province of Paita, in the department of Piura:

- Cooperativa Pesquera Jehová es mi Pastor Nada Me Faltará, located in La Tortuga fishing creek.
- Cooperativa Pesquera Jehová Rey de Reyes, located in La Islilla fishing creek.

In the province and department of Lambayeque:

• Cooperativa Pesquera San José Limitada, located in the fishing creek of San José.

There is also a group of companies that process, and export dolphinfish called **Peru Mahi Alliance (PMA)** these companies that seek for the sustainability of dolphinfish and aims for the MSC certification. Their goals are to contribute with research through monitoring, strengthen the traceability, control and surveillance through satellite tracking systems and catch records, mitigating of the sea turtles bycatch, promoting transparent and participatory governance, strengthening and enforcing the regulatory framework and fighting against IUU fishing. The PMA is working with WWF on a pilot program where the companies provide dolphinfish samples to IMARPE, with this information IMARPE produced a report on the biometry and biology of dolphinfish

7.4.1.6 Access rights to the fishery and allocation of fishing opportunities

I. Ecuador

The fishing permit is the document granted by the governing body that authorizes any fishing vessel to exercise the activity. This is the enabling document to obtain the departure permit, issued by the Ecuadorian Navy through the port authorities. The fishing permit details the type of vessel (i.e. artisanal, small, mid-scale, big-scale), the species that can be caught (in the case of surface longlines the permit points to 'large pelagics' as the target -group of- species), the authorized fishing gear, the technical characteristic of the vessel, and the authorized fishing area, this permit must always be on board. Industrial vessels must renew their fishing permits annually, while artisanal vessels are due to renew then every two years (LODAP article No. 129).

Moreover, mother-ship vessels and fiber-glass skiffs may use thin longlines (LL-DOL), thick longlines (LL-TBS) or mixed longlines at any time, except during the dolphinfish closure period, when the use of LL-DOL is forbidden.

The fishing permit can be denied when the fishery is protected, in recovery or overexploited, when there is no quota available for fishery (in the case of fisheries subject to quota), when the vessel is in a IUU list of the Ministry or RFMO or when the fleet does not comply with the law. Moreover, the fishing permit can be terminated if the vessel is sanctioned for being engaged in IUU or if it does not comply with the laws and regulations.

Article 183 of the General Regulation of the LODAP (Executive Decree No. 362) sets that fiber-glass skiffs will be considered an integral part of the fishing unit and shall be duly registered and associated with the mother-ship vessels in the records of the governing body. The LODAP establishes that mother-ship vessels that do not have hydraulic systems or haulers are considered artisanal vessels, however Article 152 of the General Regulation of the LODAP states that for all legal purposes, all vessels that operate as mother-ship vessels for longline, will be subject to the legal regime applicable to industrial vessels.

II. Perú



¹⁵ Organizaciones Pesqueras Artesanales (produce.gob.pe)

The ROP Perico has declared that dolphinfish fishery is fully exploited and established that only vessels that are in the process of formalization through the Fishing Cooperatives (Supreme Decree No. 006-2016-PRODUCE), and SIFORPA 2 (Legislative Decree No. 1392), will be able carry out access to the fishery and will be recognized as the only authorized fleet for this resource. It should be noted that the formalization processes is taking way longer than expected, according to PRODUCE the process should end on July 2023. Scientific monitoring of the fishery.

7.4.1.7 Control, inspection and enforcement system

The LODAP (Articles 212 to 214) and its General Regulations establish clear sanction mechanisms and determine in detail the causes of infractions. It determines three types of infraction: minor, medium and serious, explaining each case in detail and informing the type of sanction that corresponds to each case. It also highlights which institutions are involved in the inspection and control process.

Fishing sanctions are detailed in the LODAP (Articles 212 to 214) and are classified as minor, serious and very serious. Penalties shall be imposed according to the following criteria: seriousness of the infraction, the nature and quantification of the damage, whether it involves fragile, protected or endangered ecosystems or species, the size and power of the vessel and quantification of the damage, possibility of restoring the damage, economic benefit obtained or expected by the alleged offender as a result of his action or omission and the existing mitigating or aggravating factors (Article No. 192, LODAP). Having these items in consideration the sanctions are imposed. The types of existing sanctions are the following:

- Pecuniary sanction or fine: which may consist of fines from one to one thousand five hundred basic unified salaries (SBU);

- Confiscation of the hydrobiological species, products or goods obtained in the commission of infractions;
- Definitive confiscation of fishing gear or equipment and products or inputs of prohibited use;
- Suspension, revocation or non-renewal of authorizations or permits;
- Reduction of points in accordance with the regulations in force;
- Seizure of the fishing vessel;
- Temporary closure of the production line or aquaculture or fishing establishment; and,
- Loss of incentives (ART- 215 LODAP).

Regarding ETP species, it is determined as a serious fishing infraction to intentionally carry out fishing activities in interaction with marine mammals, sea turtles or whale sharks.

Perú

The Ministerial Resolution N°163-2017. Regulation of Fishing and Aquaculture Inspections and Sanctions (Reglamento de Inspecciones y Sanciones Pesqueras y Acuícolas) has updated the sanctioning mechanisms, detailing the causes of infringement of the fishing extractive activity, as well as the associated sanction levels and the institutions that must collaborate in the inspection process, indicating the role of each one of them.



7.4.2 Principle 3 Performance Indicator scores and rationales

PI 3.1.1 – Legal and/or customary framework

PI (3.1.1	 The management system exists within an appropriate legal and/or customary frame which ensures that it: Is capable of delivering sustainability in the UoA(s); Observes the legal rights created explicitly or established by custom of period dependent on fishing for food or livelihood; and Incorporates an appropriate dispute resolution framework 					
Scorin	g Issue	SG 60	SG 80	SG 100			
	Compatibility of laws or standards with effective management						
а	Guide post	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.			
	Met?	Yes	No	No			
Rationale							

Since the jurisdictional category applied to this fishery is the combination of 'straddling stocks 'and 'highly migratory species' exploited mainly by two Countries, Ecuador and Perú, the assessment shall consider the national legal systems of Ecuador and Perú, together with their bilateral cooperation efforts to manage the dolphinfish fish stock and the role developed by the SAC and the IATTC.

See **sections 7.4.1.2**, **7.4.1.3 and 7.4.1.4** for a detailed description of the regulatory framework applicable to the assessed fishery, including the applicable regulations, the competent authorities and research institutions involved.

SA 4.3.2.2 and details that in the case of a UoA subject to international cooperation for management of the stock, at the SG60 level teams shall interpret compatibility with laws and standards as the existence of:

- a) National and international laws, agreements and policies governing the actions of the authorities and actors involved in managing the UoA, AND
- b) A framework for cooperation with other territories, sub-regional or regional fisheries management organisations, OR
- c) Other bilateral/multilateral arrangements cooperation creates a comprehensive cooperation under the obligations of UNCLOS Articles 63(2), 64, 118, 119, and UNFSA Article 8,

Besides, SA4.3.2.3 details that cooperation "(...) shall at least deliver the intent of UNFSA Article 10 paragraphs relating to: (i) collection, sharing and dissemination of scientific data, (ii) the scientific assessment of stock status and (iii) development of scientific advice".

The actions of the authorities and actors involved in managing the UoA are governed by the legal systems in place in each of the two competent countries, as described in **sections 7.4.1.2 and 7.4.1.3**. Besides, at a national level (for the P2), the Ecuadorian authorities are governed by the national regulations adopted to manage the main primary species (blue shark) impacted by the UoA as described in **section 7.3.1.2**, and also by the national regulations, IATTC Resolutions and ratified international Agreements (e.g. ACAP, AIDCP) for the conservation of ETP species (protected sharks, turtles, marine mammals, and seabirds). These national legal systems are considered effective to deliver management outcomes consistent with MSC P1 and P2.

In agreement with SA 4.3.2.4, both Ecuador and Peru are Contracting Party to the Inter-American Tropical Tuna Commission (IATTC), and both have ratified its membership. However, up to now IATTC has not adopted specific

management measures for dolphinfish. To cover this gap, Ecuador and Peru signed in 2014 a Memorandum of Understanding on Fisheries and Aquaculture between the Ministry of Production of the Republic of Peru and the Ministry of Agriculture, Livestock, Aquaculture and Fisheries of the Republic of Ecuador, which still in force today. Among the objectives of this MoU are the following: (i) to jointly review the management measures for several fish straddling and highly migratory species, including dolphinfish; (ii) Evaluate fishing permits for vessels of both countries; (iii) coordinate the monitoring and inspection of fishing activities occurring in waters adjacent to the maritime limits of both countries. Under the framework provided by this MoU the research institutes form Ecuador and Peru (IPIAP and IMARPE, respectively) managed to coordinate a joint stock assessment completed in 2021 which also includes management advice (Roa-Ureta et al. 2022).

Based on the above, SG60 is met.

SA 4.3.2.2 and details that in the case of a UoA subject to international cooperation for management of the stock, at the SG80 level teams shall interpret compatibility with laws and standards as the existence of:

- a) National and international laws, agreements and policies governing the actions of the authorities and actors involved in managing the UoA, and
- b) That effective regional and/or international cooperation creates a comprehensive cooperation under the obligations of UNCLOS Articles 63(2), 64, 118, 119, and UNFSA Article 8,
- c) That cooperation shall at least deliver the intent of UNFSA Article 10 paragraphs relating to the collection, sharing and dissemination of scientific data, the scientific assessment of stock status and development of management advice, the agreement and delivery of management actions consistent with this sustainable management advice, and on monitoring and control, and
- d) That the flag state of fishery participants in the UoA shall be members of the relevant organisation or participants in the arrangement, or agree to apply the conservation and management measures established by the organisation or arrangement if such organisation or arrangement exists.

Under the MoU on Fisheries and Aquaculture signed between Ecuador and Peru, six binational workshops and six virtual workshops for the exchange of experiences on Dolphinfish resource have been held (2015, 2016, 2017, 2018, 2019, 2020, 2021). The exchange of information between countries enabled to update data related to the geographical distribution of the landing sites and other biological aspects associated to the dolphinfish. Furthermore, the binational workshops enabled the identification of the necessary data and applicable stock assessment models for this resource at the regional level. As a result a joint stock assessment was produced in 2021. Information on the observer program and the fishing logbooks has been shared between the two countries aiming to standardize the collected data. However, there is no evidence that this cooperation has been able to deliver joint management actions: the closed seasons and authorised hooks differ between the two countries, the minimum size is measured differently, and unlike Peru, Ecuador does not set a TAC. Thus, **SG80 is not met**.

	Resoluti	Resolution of disputes						
b	Guide post	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective .				
	Met?	Yes	Yes	No				
Rationale								

Ecuador

The Ecuadorian judicial system is governed by statutory law, not by common law or judicial precedents. The General Organic Code of Procedures which came into force in 2016 and instituted a new procedural system for all trial proceedings, except criminal and constitutional matters. The Administrative Organic Code enacted in 2017 and amended on January 21, 2022, aims to regulate the exercise of the administrative function of public sector agencies, through mechanisms of extraordinary appeals and challenges. Likewise, Article 134 establishes that administrative





claims and disputes for which no specific procedure is provided, will be resolved through an administrative procedure. Thus, despite there is no mechanism for the resolution of disputes apparent in Ecuador's fisheries laws and related instruments, the Organic Administrative Code is the mechanism through which disputes in Ecuador's fisheries law would be resolved.

Perú

Peru has applicable regulations at a national level for administrative processes and conflict management. Although the regulations are national in scope, they are applicable to the fishing sector.

The General Administrative Procedure Law, Law No. 27444, establishes the applicable legal regime so that the actions of the Public Administration serve the protection of the general interest, guaranteeing the rights and interests of those administered and subject to the constitutional and legal system in general. While the Law applies to all State entities, it includes compliance with the functions and regulatory provisions of PRODUCE and all its dependencies and agencies, as well as Regional and Local Governments.

In addition, Peru established regulations to implement strategies and protocols for the management of social conflicts, promoting dialogue among all stakeholders involved. The Presidency of the Council of Ministers - PCM, has the authority to manage social conflicts at a national level and must coordinate with the Regional and Local authorities to ensure an adequate social management. Peru has the following regulations related to conflict management and resolution: i) Guidelines and strategies for social conflict management approved by Ministerial Resolution No. 161-2011-PCM and ii) Guidelines and protocols for the intervention of the Executive, regional and local governments in social management and dialogue, approved by Resolution of the Secretariat of Social Management and Dialogue No. 008-2021-PCM/SGSD. The regulations have a national scope, but are implemented for the fishing sector through the Office of Intergovernmental Articulation and Prevention of Social Conflicts (OAIPCS, for its Spanish acronym).

PRODUCE, has an area in charge of implementing the regulations and applying them to the reality of the fishing sector is the Office of Intergovernmental Articulation and Prevention of Social Conflicts (OAIPCS). The OAIPCS is the agency of PRODUCE in charge of managing and resolving social conflicts, promoting dialogue, and providing social support for the resolution of disputes. This area is also responsible for promoting coordination and agreement mechanisms with regional and local governments for the prevention and resolution of social conflicts related to the fishing sector.

Perú-Ecuador/IATTC

There is no conflict resolution mechanisms at a binational level related to the dolphinfish fishery. Nevertheless, both countries belong to the Andean Community. The Andean Community has a Court of Justice where the parties can settle disputes that cannot be resolved by other administrative or judicial means. Additionally, both countries as members of the IATTC can use the Part VII of the Antigua Convention that establishes a framework for dispute resolution. Several mechanisms exist for dealing with legal disputes at the international level. Although this does not specify a concrete mechanism. Disputes can be dealt with at the IATTC annual meetings of the Parties through consultation and conciliation. Technical disputes might be resolved by an appropriately composed expert or technical panel. As a last step, disputes might be resolved through either the International Court of Justice or the International Tribunal for the Law of the Sea (ITLOS), though this recourse is most likely to be used by states which have ratified the 1995 UN Fish Stocks Agreement (UNFSA).

SG60 and 80 are met because the management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes arising within the system which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA. **SG 100 is not met** because there is no evidence that the mechanism has been tested and proven to be effective in the context of the fishery.

Respect for rights



		objectives of MSC Principles 1 and 2.	objectives of MSC Principles 1 and 2.			
	Met?	Yes	Yes	No		
Rationale						

At the IATTC level, legal rights of people dependent on fishing for food or livelihood are protected through national interests of Parties to the Convention. The Convention deals with the rights of a State's access to resources rather than individuals. Thus, this SI is assessed only at National level.

Ecuador

Article 281 of Ecuador's constitution states: "Food sovereignty constitutes a strategic objective and an obligation of the state to ensure that individuals, communities, peoples, and nationalities achieve the self-sufficiency of healthy and culturally appropriate foods on a permanent basis".

Furthermore, Ecuador, through the LODAP and its General Regulations, establishes the mechanisms to manage fishing resources, guaranteeing fishermen's access to the activity within a clear and accessible framework. Article 7, paragraph 42 and section II of the LODAP establishes the characteristics of artisanal fishing and indicates the duties of fishermen. Likewise, Article 7, paragraph 46, and Section II of LODAP states the characteristics of industrial fishing. Additionally, the General regulation of the LODAP (article 152 and 183) establishes the characteristics and regulations of the fiber-glass skiffs and the mother-ship vessels that fish with longline. Moreover, the participatory processes implemented to design and evaluate the National Action Plans, such as the PAN Dorado, provides opportunity to all stakeholders (including users with customary rights) to express their views and concerns in relation to fisheries management.

Perú

Law No. 31315 on Food and Nutritional Security, approved on July 22, 2021, states that within the framework of food sovereignty, the country must promote the development of sustainable policies and strategies for food production, distribution and consumption that guarantee the right to healthy and nutritious food for the entire population, respecting cultural biodiversity and its productive systems. In addition, the guidelines of the Law establish the promotion of favorable conditions for the production, marketing and distribution of the products of the country's small and medium-sized producers.

According to the Peruvian Fishing Law No. 25977, the fishing activity must be regulated to promote its sustained development as a source of food, employment, and income, and to ensure the sustainable use of the hydrobiological resources. The Law establishes that the State must encourage the participation of natural or juridical persons in fishing activities and establishes a clear separation between artisanal and industrial fishing. Additionally, according to articles 44 and 45 of the Law, concessions, authorizations and permits for fishermen are specific rights granted by PRODUCE for the development of fishing activities in a determined period. It is important to highlight that artisanal fishermen and persons engaged in research are exempted from paying these fees. To ensure technical, economic, and financial support for the development of maritime and continental artisanal fishing activities the Law establishes the creation of the Fisheries Development Fund (FONDEPES).

Moreover, the participatory processes implemented to design and evaluate the National Action Plans, such as the PAN Dorado, provides opportunity to all stakeholders (including users with customary rights and people dependent on fishing for food and livelihood) to point out their views and concerns in relation to fisheries management.

SG80 is met there is a management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. However, despite the provisions in the Laws and regulations, and the participatory mechanisms established, the management system is not formally committed by customary rights. **SG100 is not met.**

References

Ecuadorian Executive Decree 362/2022 Ecuadorian Official Registry No. 187/2020 Ecuadorian Ministerial Agreement MPCEIP-SRP 2021-0145-A, IATTC 1990. MoU 2014.



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

Draft scoring range	60-79
Information gap indicator	 More information sought: Are there, in either of the two countries, cases of disputes that have had to be taken to higher levels? Are there appeals filed against governments in relation to access to fishing resources by coastal communities dependent on fishing?

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

Overall Performance Indicator score

Condition number (if relevant)



PI 3.1.2 – Consultation, roles and responsibilities

PI (3.1.2	The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties						
Scorin	g Issue	SG 60	SG 80	SG 100				
а	Roles a	Roles and responsibilities						
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.				
	Met?	National levels: Yes International level: Yes	National levels: Yes International level: No	National levels: No International level: No				
Rationale								

The roles and responsibilities of the different organizations, bodies and entities involved in the management process (including research) both at national and international levels are assessed in this SI. See sections 7.4.1.3. and 7.4.1.4 for a detailed description on the entities and institutions involved.

Ecuador

At national level, the roles and responsibilities of organisations and individuals who are involved in the management process are defined in the LODAP and the Executive Decree 362, including the mechanisms to ensure the necessary interinstitutional coordination.

The highest authority in matters of fisheries management in the country is the Vice-Ministry of Aquaculture and Fisheries that is part of the Ministry of Production, Exterior, Investment and Fisheries. The Vice-Ministry regulates, promotes and manages the use of fishing and aquaculture activities, based on policies, strategies, standards and technical and legal instrumentation for this purpose. The Under Secretariat for Fishery Resources (SRP, Spanish acronym) is part of the Vice-Ministry of Aquaculture and Fisheries, and is responsible for the supervision and implementation of the of the national fisheries policy, guarantees compliance with fisheries laws and regulations, elaborates fisheries development plans and programs, coordinates the activities of the public and private sectors, manages fisheries financial credit, endorse reports and plans of companies in the fisheries sector, and commissions studies on the activity, management, and development of the fishing sector.

The scientific information is provided by the IPIAP that aims to give information and scientific-technological knowledge to guarantee the rational use of hydrobiological resources and their ecosystems, providing management and conservation measures to the competent authorities, contributing with the sustainable development of the fishing and aquaculture sector.

Based on the above the team considers that in Ecuador, organizations and individuals in the management process ae clearly identified and its functions, roles and responsibilities are explicitly defined and well understood for KEY areas of responsibility and interaction. Thus, **SG60 and SG80 are met.**

However, the role and responsibility of some bodies created, such as the Advisory Council of the dolphinfish (CCRD) created in 2011 is not clear. For instance, the CCRD never established statutes or scheduled activities (WWF, 2019). **SG100 is not met.**

Perú

The Ministry of Production has exclusive competence in fisheries and aquaculture management, industrial fisheries at the national level. The Vice-Ministerial Office of Fisheries and Aquaculture is the authority in charge of fisheries and



aquaculture management at the national and sectoral level. Furthermore, the General Directorate of Artisanal fisheries (DGPA, Spanish acronym) is the technical area responsible for promoting and implementing, within the framework of national and sectoral policy, management, formalization, and productive innovation measures for the development of artisanal fishing and sport fishing activities, as well as for the business management of artisanal fishing infrastructure, ensuring the sustainable use of hydrobiological resources.

The roles and responsibilities of organisations and individuals involved in the fisheries management process are set in the Regulation of Organization and Functions of the Ministry of Production, DS 002-2017-PRODUCE. The Vice-Ministerial Office of Fisheries and Aquaculture (DVMPA) of PRODUCE is the authority in charge of fisheries and aquaculture management at the national and sectoral level, ensuring a sustainable use of hydrobiological resources. Additionally, the DVMPA, through its General Directorates, implement actions of supervision, implementation of the fishing policy and its regulations. In relation to dolphinfish, they elaborate specific regulations and ensure their implementation and compliance. They also elaborate fishing development plans and programs, coordinate with the different actors of the public and private sector, and manage the sector's budget.

PRODUCE shares responsibility for artisanal fisheries with regional and local governments. Specific shared functions include the creation of national regulations and policies; formulation and approval of national plans; resource management for sustainable development; supervision, monitoring and control of compliance with regulations and technical guidelines, as well as permanent coordination among the three levels of government for the implementation of such regulations, policies and plans. Therefore, each Regional Government has a Regional Directorate of Production (DIREPRO or GEREPRO, by its Spanish acronym), that must adapt, formulate, implement and monitor compliance with public policies on fisheries and aquaculture.

In relation with the access to scientific information about the dolphinfish resource, Peru has the Peruvian Ocean Institute (IMARPE, Spanish acronym) that oversees scientific research in fisheries and aquaculture to safeguard the sustainable use of marine and continental resources and ecosystems. IMARPE provides scientific information to PRODUCE for accurate decision-making and for the elaboration of regulations related to fisheries.

Based on the above the team considers that in Peru, organizations and individuals in the management process ae clearly identified and its functions, roles and responsibilities are explicitly defined and well understood for KEY areas of responsibility and interaction. Thus, **SG60 and SG80 are met.**

However, more information is needed to ascertain if this is also true for ALL areas of responsibility and interaction. **SG100 is not met.**

International cooperation

Both Ecuador and Peru are Contracting Party to the Inter-American Tropical Tuna Commission (IATTC), and both have ratified its membership. However, up to now IATTC has not adopted specific management measures for dolphinfish.

In June 2012, during the 83rd Annual Meeting of the IATTC, the parties agreed that the Commission's scientific staff should begin the stock assessment of the dorado resource, in the Convention area. As a result, the SAC got involved and an exploratory stock assessment for the dolphinfish in the SE Pacific Ocean was elaborated and submitted to the 7th meeting of the SAC held in May 2016. As far as the team is aware, the SAC did not continue to work on the monitoring or assessment of this species, and the work was taken over by the national research institutions of Ecuador and Peru (IPIAP and IMARPE, respectively). The joint assessment was submitted to the 13th meeting of the SAC held in May 2022, but only as an informative document. The IPIAP and the IMARPE worked together under the framework provided by the MoU on Fisheries and Aquaculture signed by the two countries in 2014 (for more details see PI3.1.1(a)). However, this MoU does not provide sufficient details on the roles and responsibilities of derived from its implementation. Also, there is no evidence that the actions implemented under this MoU has been able to deliver joint management actions (as discussed in PI 3.1.1(a)).

Based on the above, the team considers that an international level organisations and individuals involved in the management process have been identified, and their functions, roles and responsibilities are generally understood. **SG60 is met.**

However, the following limitations lead to consider that **SG80 is not met**:

• The functions and role of the IATTC (and the SAC) are not explicitly defined and well understood in relation to this fishery.



• The existing MoU between Ecuador and Peru does not provide explicitly defined and well understood functions, roles and responsibilities for key areas of responsibility and interactions of the different organizations involved in the fisheries management.

	Consulta	ation processes		
b	Guide post	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used .
	Met?	Yes	Yes	No

Rationale

No specific regulations for the dolphinfish fishery have been adopted by the IATTC, so this SI will be assessed only at the national level.

Ecuador

The Organic Law of Transparency and Access to Public Information approved on May 18, 2004, establishes in Article 4, letter "e", that the transparent management of public information must be guaranteed, enabling citizen participation in decision making of general interest.

The new LODAP passed in 2020, includes the **Advisory Council of Aquaculture and Fisheries** as part of the fisheries management system (Article 11). This Council is a forum for dialogue, consultation and agreement between the public and private sectors, and its objective is to advise the fishing sector on monitoring and compliance with internal agreements to facilitate efficient relations between the different actors in the production chain. With the approval of the LODAP and its regulations, it is established that the spaces for dialogue and participation for the NAPs are provided through dialogue roundtables.

The first PAN Dorado (2011-2016) was developed through a participatory process that involved the main stakeholders related to the fishery. In 2013, a revision of the PAN Dorado was carried out where the objectives and the activity followup table was adapted. Various stakeholders such as fishermen's organizations, public sector representatives, academia and NGOs also participated in this process. In 2019 a new NAP (2019- 2024) was developed with the participation of the key stakeholders.

Based on the above the team considers that **SG60 and SG80 are met**. However, as far as the team is aware the management system does not provide explanations on how the information collected through consultation is used or not used. **SG100 is not met.**

Perú

The Regulation that establishes provisions related to the publicity, publication of Draft Regulations and dissemination of General Legal Norms, approved on January 15, 2009 by Supreme Decree No. 001-2009-JUS, indicates that the governing body of the regulation must publish it 30 days before it becomes effective. The pre-publication is made in the Official Gazette "El Peruano" so that interested stakeholders can make consultations and suggestions on the proposed measures. During the pre-publication, there is a person in charge of receiving the suggestions. However, citizen proposals during the pre-publication process are non-binding.

The ROP Perico was developed in a participatory manner, first, on June 2020, the Ministry of Production (PRODUCE) created a sectoral technical working group (Grupo técnico de trabajo sectorial- GTTS) for the construction of a ROP proposal. The GTTS was composed by experts of different areas of PRODUCE, experts from WWF-Perú and from universities. The GTTS had 14 meetings to elaborate the problem tree for this fishery, which served as input for the initial ROP proposal. Once the ROP proposal was developed, a socialization process was carried out with the participation of the main actors in the production chain related to this resource.



Prior to the official pre-publication of the ROP, PRODUCE with the assistance of WWF organized five socialization workshops. The aim of the workshops was to consider the contributions, comments and recommendations of the main actors involved in this fishery, while collecting and answering their questions.

Based on the above the team considers that **SG60 and SG80 are met**. However, as far as the team is aware the management system does not provide explanations on how the information collected through consultation is used or not used. **SG100 is not met.**

	Participation						
C	Guide post	The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.				
	Met?	Yes	Νο				
Ration	ale						

No specific regulations for the dolphinfish fishery have been adopted by the IATTC, so this SI will be assessed only at the national level.

Ecuador

According to article No. 95 of the Constitution citizens, individually and collectively, will participate as protagonists in decision-making, planning and management of public affairs. Moreover article No. 227 states that the public administration is a service to the community that is governed by the principles of effectiveness, efficiency, quality, hierarchy, decentralization, coordination, participation, planning, transparency and evaluation, coordination, participation, planning, transparency and evaluation, coordination, participation, planning, transparency and evaluation. The new LODAP passed in 2020, includes the **Advisory Council of Aquaculture and Fisheries** as part of the fisheries management system (Article 11). This Council is a forum for dialogue, consultation and agreement between the public and private sectors.

As explained in 3.1.2. b, the creation, update and renewal of the NAP-Dolphinfish was made through a participatory process were key stakeholders actively participated.

Additionally, The General Regulation of the LODAP in the Chapter II Section I details the possibility of setting up dialogue roundtables for the fishing sector as an instrument for the participation of public-private sectors in decision-making process. Ensuring that the process is participatory, transparent, inclusive, multidisciplinary and scientifically based, for the design, socialization, dissemination of proposals of the National Action Plans of the fishing sector, to guarantee the sustainability of the fishery with responsibility and awareness of all actors. The roundtable dialogue must promote inclusive participation of all stakeholders in the governance of the fishery. It can provide recommendations to the leading agency of national aquaculture and fisheries policy appropriate measures for the management and management of the fishery, considering the biological-fishery, oceanographic, environmental, social and economic status.

Every NAP must conform a roundtable dialogue for a period of 5 years. The roundtable dialogue for the NAP is integrated by the following members:

- Presided by the head of the governing body of the National aquaculture and fisheries policy or his delegate and will have the casting vote.
- Permanent coordinator represented by the Director of Fisheries and Aquaculture Policies or his delegate, the permanent coordinator will oversee the operational functioning of the table.
- Director of IPIAP or his delegate,
- Representatives of the artisanal fishing sector,
- Representatives of the extractive industrial fishing sector; and,
- Representatives of the industrial fishing processing and marketing sector.

Additionally, a rotating secretary will be elected from among the members, who will prepare the report of each session, which will be forwarded to the Advisory Council on Aquaculture and Fisheries.


Based on the above, the team considers that SG80 is met.

However, in 2019 the NAP was evaluated by an external entity (WWF, 2019) that highlighted that the participation process for the implementation of the NAP was deficient, as it did not involve stakeholders in the process and failed to establish the NAP Advisory Council. Besides, at the time of preparing this report, no details on the implementation and performance of the Advisory Council of Aquaculture and Fisheries were made available for the team, and the dialogue roundtable for the NAP Dorado mandated by the LODAP has still not been established. **SG80 is not met.**

Perú

The construction of the ROP Perico was made thorough a participatory process (see 3.1.2. b), where a group of technical stakeholders created a draft for the ROP, that was socialized with multiple stakeholders from throughout the production chain. Stakeholders provided their opinions and concerns on the proposed regulation. In addition, during the workshops, management was able to respond to questions and take into account the input, comments and recommendations that were made to improve the proposed ROP.

In the case of the Perico ROP, a participatory process was carried out to involve all stakeholders involved in the dolphinfish fishery. However, these participation procedures are not regulated.

Based on the above, the team considers that SG 80 is met. More information would be needed to assess if current consultation process encourage and facilitate effective participation. SG100 is not met.

References

MPCEIP, 2019. MINJUS, 2016. WWF, 2019

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

Draft scoring range	60-79
Information gap indicator	 More information sought: Gather more information about the participatory process and find out why the advisory council for the dolphinfish was not established. Gather more information about the implementation and performance of the National Advisory Council Gather more information about the roundtable dialogue. Gather more information about the feedback provided after consultation and participatory processes. Gather more information about the future of the MoU, and roles and functions derived from its implementation

Overall Performance Indicator score		_
Condition number (if relevant)		



PI 3.1.3 – Long term objectives

PI (3.1.3	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scorin	g Issue	SG 60	SG 80	SG 100
	Objectiv	es		
а	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are explicit within and required by management policy.
	Met?	Yes	No	No
Rationale				

No specific regulations for the dolphinfish fishery have been adopted by the IATTC, so this SI will be assessed only at the national level.

Ecuador

Article 14 of the Constitution of the Republic of Ecuador establishes "the right of the population to live in a healthy and ecologically balanced environment that guarantees sustainability and good living"; furthermore, "The preservation of the environment, the conservation of ecosystems, biodiversity and the integrity of the country's genetic heritage, the prevention of environmental damage and the recovery of degraded natural spaces are declared to be in the public interest. Article 73 orders the State to apply precautionary and restriction measures for activities that may lead to the extinction of species, the destruction of ecosystems or the permanent alteration of natural cycles. Finally, Article 395 recognizes as environmental principles, in paragraph 1, "The State shall guarantee a sustainable model of development, environmentally balanced and respectful of cultural diversity, that conserves biodiversity and the capacity for natural regeneration of ecosystems and ensures the satisfaction of the needs of present and future generations".

In Ecuador the LODAP constitutes the overarching legal framework to establish the legal regime for the development of aquaculture and fishing activities in all their phases of extraction, harvesting, reproduction, breeding, cultivation, cultivation, processing, storage, distribution, internal and external commercialization, and related activities such as the promotion of the production of healthy food; the protection, conservation, research, exploitation and use of hydrobiological resources and their ecosystems, through the application of the ecosystemic fishing approach in such a way as to achieve sustainable and sustainable development that guarantees access to food, in harmony with the principles and rights established in the Constitution of the Republic, and respecting traditional and ancestral knowledge and forms of production.

Article 141 of the LODAP establishes that the quota shall be fixed according to the available biomass of the respective fishery, based on the scientific-technical reports of the IPIAP subject to the provisions of Management Measures. The quotas may be allocated in proportion to the quota of each vessel, by vessel or groups of vessels, with respect to certain species or groups of species, by zones, time periods, fishing modalities or other criteria that the governing body deems pertinent.

AGREEMENT No. MPCEIP-SRP-2021-0194-A, issued on September 1, 2021, establishes the prohibition to increase the carrying capacity expressed in Net Register Tonnage (NRT) or cubic meters (m3) of the Ecuadorian artisanal fishing fleet. With Ministerial Agreement No. 124 issued on April, 17, 2014 states that is forbidden to increase the carrying capacity expressed in Net Register Tonnage (NRT) or cubic meters (m3) of the Ecuadorian increase the carrying capacity expressed in Net Register Tonnage (NRT) or cubic meters (m3) of the Ecuadorian terms and fishing fleet.

The National Action Plans consider the need for the best scientific information to make management decisions in each fishery. There are currently 3 Action Plans in place, the dorado fishery plan (PAN Dorado) is one of those. The general objectives of the Action Plans are to establish regulations based on scientific knowledge, to improve the processes of

participation and control of the fisheries and to ensure the conservation of the target species and to minimize the impact of the activity on the environment.

Based on the above, the team considers that long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are not only implicit but also explicit within management policy. Thus, **SG60 is met**. However, as far as the team is aware no clear long-term objectives guiding decision-making (such those expressed in Article 2 in the Regulation of the Parliament and the European Council N1380/2013¹⁶) can be found in the management policy. Thus, **SG80 is not met**.

Perú

In Perú the General fisheries Law, approved by Decree Law No. 25977, is the legal framework for fisheries, Article 9 of the General Fisheries Law, establishes that the PRODUCE, based on available scientific evidence and socioeconomic factors, determines (according to the type of fisheries, fishing management systems) the allowable catch quotas, fishing seasons and areas, fishing effort regulation, fishing methods, minimum catch sizes and other regulations required for the preservation and rational exploitation of hydrobiological resources.

Additionally, in Article 2 of the Regulations of the General Fisheries Law, approved by Supreme Decree No. 012-2001-PE, establishes that PRODUCE must ensure a balance between the sustainable use of hydrobiological resources, environmental conservation and socio-economic development, in accordance with the principles and norms of the Political Constitution of Peru, the Organic Law for the Sustainable Use of Natural Resources, the General Fisheries Law, the Framework Law of the National Environmental Management System, the Regulations of the Framework Law of the National Environmental Management System and the General Environmental Law.

Perú establishes action plans to ensure the sustainable management of fishery resources establishing objectives and activities in the medium and long-term, the PAN Perico was approved in 2016.

Based on the above, the team considers that long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are not only implicit but also explicit within management policy. Thus, **SG60 is met**. However, as far as the team is aware no clear long-term objectives guiding decision-making (such those expressed in Article 2 in the Regulation of the Parliament and the European Council N1380/2013) can be found in the management policy. Thus, **SG80 is not met**.

References

Ecuadorian Ministerial Agreement MPCEIP-SRP-2021-0194-A. Ecuadorian Ministerial Agreement No. 124/2014 Peruvian Decree Law No. 25977

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

Draft scoring range	60-79
Information gap indicator	More information sought Check if something is missing in relation to long- term objectives expressed in National policy and regulations for both Ecuador and Peru.

Overall Performance Indicator score	
Condition number (if relevant)	

¹⁶ The following objective is provided here as an example of clear long-term objective Regulation (EU) N1380/2013: Article 2(2) "*In* order to reach the objective of progressively restoring and maintaining populations of fish stocks above biomass levels capable of producing maximum sustainable yield, the maximum sustainable yield exploitation rate shall be achieved by 2015 where possible and, on a progressive, incremental basis at the latest by 2020 for all stocks".



PI 3.2.1 – Fishery-specific objectives



The fishery-specific management system assessed in this PI is only the Ecuadorian fishery since no Peruvian vessel is included in the UoA and the MSC P2 is only applicable up to the UoA level. However, since this is also a tuna longline fishery it is subject to all IATTC Resolutions on bycatch species such as sharks and marine turtles. However, no specific regulations for the dolphinfish fishery have been adopted by the IATTC or under the bilateral agreement signed between Ecuador and Peru, so in relation to P1 this SI will be assessed only for Ecuador.

Ecuador

The Ecuadorian National Action Plans consider the need for the best scientific information to make management decisions in each fishery. There are currently 3 Action Plans in place (Shrimp Ointment, Dolphinfish and Shark). The general objectives of the Action Plans are to establish regulations based on scientific knowledge, to improve the processes of participation and control of the fisheries and to ensure the conservation of the target species and to minimize the impact of the activity on the environment.

The latest PAN Dorado for 2019-2024 was officially approved by the SPR with agreement **No. MPCEIP-SRP-2021-0145-A** in June 2021. The main goal of the current PAN Dorado is to ensure the conservation and sustainable use of dolphinfish resource, through the following components: i) management, government and financial sustainability, ii) monitoring, control and surveillance, iii) education, extension and communication, and iv) research and development. The SRP will issue the necessary regulations and instruments for the implementation of the PAN Dorado 2019-2024.

Moreover, the specific objectives of the PAN Dorado aim to ensure the sustainability of dolphinfish resource and its ecosystem. The established specific objectives are the following:

- 1) Strengthen the regulatory framework through the formulation of evidence-based fisheries measures based on scientific-technical evidence to ensure and implement the sustainable use and conservation sustainable use and conservation of the dorado resource.
- 2) To guarantee monitoring, control and surveillance for the conservation and sustainable use of dorado resources in Ecuador.
- 3) Strengthen the technical capacities of key stakeholders and develop an educational program directed to fishing communities to strengthen and promote awareness of sustainable fishing of the dorado resource and the reduction of bycatch of non-target species.
- 4) Generate priority scientific information for the management of the resource through the implementation of a Five-Year Plan for the management of the resource.

The actions designed to achieve those specific objectives were grouped in five components:

- 1) Management, Governance and financial sustainability
- 2) Control and Inspection
- 3) Training, awareness and communication
- 4) Monitoring and Research



In addition, the PAN Dorado has an action plan with specific actions and timelines. Each action contains a summary of the measures implemented to date and details the actions to be taken and the expected results. However, there is no actions aimed to reduce incidental catches. The previous PAN included a fifth component aimed to reduce incidental catches. However, this component was removed from the PAN for 2019-2024. The PAN will be valid for five years (December 2019 - December 2024), after that, the PAN will be evaluated and updated (as it was already the case in 2018/19). A single aimed to reduce incidental interactions with ETPs was included in the PAN 2019-2024: "to perform studies on the alternate fishing gear to avoid catching turtles". However, in relation to bycatches and protected species, this fishery is subject to IATTC Resolutions on the conservation of sharks and marine turtles. These regulations are detailed in 7.3.1.4, but basically they prohibiting targeting and retaining on board turtles and protected sharks, which shall be released alive, if possible, to sea. Also, Ecuador is also signatory member of binding international Agreements on the conservation of albatrosses and petrels (ACAB) and dolphins (AIDCP). As a result, Ecuador has different regulations dealing with the conservation of protected sharks, turtles and marine mammals which are aligned with the objectives of these international regulations and Agreements (more details in **section 7.3.1.4**).

Based on the above, the team considers that the combination of the Ecuadorian fishery-specific management system (PAN Dorado and related Ministerial Agreements), IATTC Resolutions on sharks and turtles, and binding international Agreements ensure that short and long-term objectives consistent with achieving the outcomes expressed by MSC's Principles 1 and 2. Thus, **SG60 and SG80 are met.**

However, most of these objectives are not well-defined and measurable. For instance, the team considers that the formulation of objectives in PAN-Dorado and the scheduling of activities linked to these objectives do not allow evaluation of the level of compliance with the activities. **SG100 is not met.**

References

Ecuadorian Ministerial Agreement MPCEIP-SRP-2021-0145-A. MPCEIP, 2019

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

Draft scoring range	≥80
Information gap indicator	 More information sought: Check if the PAN 2019-2024 includes any objectives related to reduce incidental catches. Get more insight on the objectives and scheduled activities included in PAN 2019-2024.

Overall Performance Indicator score	
Condition number (if relevant)	



PI 3.2.2 – Decision-making processes

PI (3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery				
Scorin	g Issue	SG 60 SG 80 SG 100				
	Decisior	Decision-making processes				
а	Guide post	There are some decision- making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.			
	Met?	National levels: Yes International level: Yes	National levels: Yes International level: No			
Rationale						

The decision-making processes assessed in this PI include the ones in place at the Ecuadorian level and those relative to the bilateral cooperation between Ecuador and Peru.

Ecuador

The IPIAP is the scientific body that advises the SRP on decision-making and the issuance of dolphinfish management regulations. The IPIAP uses the information from on-board observers and the data from the landing control program to obtain scientific data on the dolphinfish resource and from this information to be able to have the necessary information for better decision making.

The SRP, based on the information provided by the IPIAP, is responsible for making and applying management decisions for the dolphinfish fishery based on the available data. Several Ministerial Agreements setting management measures have been passed. The Agreements in force: (i) Agreement 070 passed in May 2011 setting the minimum size, the closed season, and the authorized hooks and authorised vessels; (ii) Agreement 407 passed in October 2011 setting the characteristics of the longline vessels and the maximum number of skiffs per mothership; (iii) Agreement MPCEIP-SRP-2021-0208-A modifying the previous observer program adopted in 2011.

Based on the information presented above, SG60 and SG80 are met.

Bilateral cooperation between Ecuador and Peru

Ecuador and Peru signed in 2014 a Memorandum of Understanding on Fisheries and Aquaculture between the Ministry of Production of the Republic of Peru and the Ministry of Agriculture, Livestock, Aquaculture and Fisheries of the Republic of Ecuador, which still in force today. Under the MoU on Fisheries and Aquaculture signed between Ecuador and Peru, six binational workshops and six virtual workshops for the exchange of experiences on Dolphinfish resource have been held (2015, 2016, 2017, 2018, 2019, 2020, 2021). The exchange of information between countries enabled to update data related to the geographical distribution of the landing sites and other biological aspects associated to the dolphinfish. Under the framework provided by this MoU the research institutes form Ecuador and Peru (IPIAP and IMARPE, respectively) managed to coordinate a joint stock assessment completed in 2021 which also includes management advice (Roa-Ureta et al. 2022). Also, joint study on the genomic characterization of the dolphinfish was completed. Information on the observer program and the fishing logbooks has been shared between the two countries aiming to standardize the collected data. **SG60 is met.**

However, there is no evidence that this cooperation has been able to deliver joint management actions: the closed seasons and authorised hooks differ between the two countries, the minimum size is measured differently, and unlike Peru, Ecuador does not set a TAC. Thus, the team considers that current bilateral cooperation between the two countries does not constitute an established and effective decision-making process. **SG80 is not met.**

b	Respon	siveness of decision-making	g processes	
	Guide post	Decision-making processes respond to serious issues	Decision-making processes respond to serious and other	Decision-making processes respond to all issues



	identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
Met?	Yes	No	No

Rationale

The decision-making processes assessed in this PI include the ones in place at the Ecuadorian level and those relative to the bilateral cooperation between Ecuador and Peru.

The PAN Dorado was first created in 2011 and reviewed in 2013 and 2019. A new PAN Dorado for 2019-2020 has been adopted. Also, a new regulation on the observer program has been recently passed (MPCEIP-SRP-2022-A). The main objective of this regulation is to double the observer coverage compared to the previous observer program passed in 2011.

In 2014, Ecuador and Peru signed a MoU to coordinate and improve the management of certain straddling and highly migratory species which were not managed by the IATTC or any other RMFO at the time, such as it was the case for the dolphinfish. The exchange of information between countries enabled to update data related to the geographical distribution of the landing sites and other biological aspects associated to the dolphinfish. Under the framework provided by this MoU the research institutes form Ecuador and Peru (IPIAP and IMARPE, respectively) managed to coordinate a joint stock assessment completed in 2021 which also includes management advice (Roa-Ureta et al. 2022). **SG60 is met.**

However, the key technical measures for managing the fishery have remained unchanged since 2011: closed season, minimum size, authorised hook types. These measures are not fully aligned with those adopted by the Peruvian administration and there is no evidence that the effectiveness of these measures have been evaluated neither at the national level nor at the bilateral level. For instance, in the case of the authorised hook types, it has been pointed out in the National Action Plan for the Conservation of Marine Turtles that C-type hooks can reduce incidental mortality of sea turtles, and IATTC C-19-04 states that only large circle hooks shall be use, but J-hooks are still in authorised when using the LL-DOL. The effectiveness of the minimum size and closed season to avoid catches juveniles is another example, since landing data confirms that individuals below minimum size are being caught but the team is not aware that an evaluation of the effectiveness of these measures has been accomplished, and no alternative measures have been proposed.

Based on the above the team considers that **SG80 is not met.**

	Use of precautionary approach	
с	Guide post	Decision-making processes use the precautionary approach and are based on best available information.
	Met?	No
Ration	ale	

The decision-making processes assessed in this PI include the ones in place at the Ecuadorian level and those relative to the bilateral cooperation between Ecuador and Peru.

According to Article No. 96 of the LODAP, it is established that fishery management measures will be adopted after a scientific technical report from the IPIAP, and socialization with the fishing sector based on the best scientific evidence available and ancestral knowledge in accordance with the population conditions of the resources and the state of the fisheries.



However, there is no evidence that decision-making processes have use the precautionary approach in the case of the dolphinfish fishery. For instance the closed season is shorter in Ecuador than in Peru, and unlike Peru, Ecuador does not set a TAC. Other examples are that J-hooks are still in use despite IATTC C-19-04 advices otherwise. Thus, **SG80** is not met.

	Account	ability and transparency of	management system and d	lecision-making process
d	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Yes	No	Νο
Rationale				

T The decision-making processes assessed in this PI include the ones in place at the Ecuadorian level and those relative to the bilateral cooperation between Ecuador and Peru.

Information about the fishery management mechanisms is on the Ecuadorian Ministry's website. However, there is no accessible information about annual fishing effort, percentage of catches, among others.

The fishing sector and other stakeholders had the chance to participate in the design and review of the PAN Dorado.

The reports of the bilateral meeting held under the MoU are not publicly available, but they were requested to the Authorities by the client and shared with the team.

Based on the above, the team considers that SG60 is met.

On December 2020, Ecuador signs an agreement with **Global Fishing Watch (GFW)**. By joining the GFW platform, Ecuador facilitates enhanced monitoring of the 1,200 vessels that make up Ecuador's industrial and small-scale fishing fleets. This will help increase accountability for vessels throughout the region and represents a common effort to achieve transparency across the global ocean.

However, at the time of preparing this report no details on the implementation and performance of the Advisory Council of Aquaculture and Fisheries were made available for the team, and the dialogue roundtable for the NAP Dorado mandated by the LODAP has still not been established.

Further information is needed to assess if SG80 is met. At this stage the team considers that SG80 is not met.

Approach to disputes Although the management The management system or The management system or authority or fishery may be fishery is attempting to comply fishery acts proactively to subject to continuing court in a timely fashion with judicial avoid legal disputes or rapidly е challenges, it is not indicating decisions arising from any implements judicial decisions Guide a disrespect or defiance of the legal challenges. arising from legal challenges. post law by repeatedly violating the same law or regulation for necessary the sustainability for the fishery.



	Met?	Yes	Yes	No
Ration	ale			

No specific regulations for the dolphinfish fishery have been adopted under the bilateral agreement signed between Ecuador and Peru. Thus, the management authority assessed in this PI is restricted to the Ecuador.

Fishing in Ecuador is one of the country's main economic and social activities. For this reason, the Fisheries Administration is constantly working to improve access to resources within a framework of sustainability and with greater participation of the fishing sector, scientists and civil society. The use of participatory for the design and review of the PAN Dorado decreases the chances of disrespect or defiance of the law by the stakeholders. According to the communications received from the client the fishery is not subject to continuing court and the management system is attempting to comply in a timely fashion with judicial decisions that may arise from legal challenges. Based on the communications received from the client, it is considered that **SG60 and SG80 are met**. However, team did not have specific information about this topic when preparing the ACDR. More information is needed to assess **SG100 is not met**.

References

The CAB shall list any references here, including hyperlinks to publicly-available documents.

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

Draft scoring range	<60
Information gap indicator	 More information sought: Check if there are court challenges affecting the fishery. Check if the management system complies in a timely fashion with judicial decisions arising from legal challenges. Check if there is evidence of the precautionary approach being used by the decision-making processes in the fishery Request details on the implementation and performance of the Advisory Council of Aquaculture and Fisheries, and also of the dialogue roundtable for the NAP Dorado Request details about the level of accountability and transparency of the management system

Overall Performance Indicator score	
Condition number (if relevant)	



PI 3.2.3 - Compliance and enforcement

PI	3.2.3	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with					
Scoring Issue		SG 60	SG 80	SG 100			
	MCS im	plementation					
а	Guide post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.			
	Met?	Yes	No	Νο			
Rationale							

. The MCS mechanisms assessed in this PI are restricted to Ecuador.

According to the LODAP monitoring, control and surveillance (MCS) activities must be carried out in all places where fishing and related activities are developed and throughout all the phases of the productive chain of the fishing activity. The Ecuadorian Fisheries Authority must have free access to the facilities, vessels, docks and any other premises where the activity is carried out and must have access to the information required for the fulfillment of its attributions.

To ensure the MCS of fishing activities, the LODAP establishes diverse mechanisms such as:

- The implementation of MCS systems.
- Inspections of ports and vessels.
- Technical reports from government institutions such as the IPIAP, on-board observers and the Satellite Monitoring Center (Centro de Monitoreo Satelital- CMS).
- Fishing logbook, image recording system and a weighing system.

To track, identify and localize industrial and artisanal fishing vessels must have a tracking devise that has to be authorized by the National Defense entity, the information about the location of the vessels is managed by the Administration of the Monitoring Center (*Administración del Centro de Monitoreo*). The Administration of the Monitoring Center can share the tracking information with the IPIAP (see 7.4.1.4.) so they can identify and establish the fishing areas of the artisanal and industrial fleets. Agreement MPCEIP-SRP-2022-0150 sets that the Satellite Monitoring Device (DMS or VMS in English) is mandatory for all industrial vessels and longline mothership vessels. According to the client, all mothership vessels have VMS installed.

All vessels must have a fishing logbook that can be physical or electronic, and it shall be filled out daily in a complete, reliable and timely manner, to be delivered at the time of landing or completion of fishing operations. The logbook must have the general data of the vessel, information of departure and arrival, fishing gear, geographic location, start and end time of each fishing set, estimated catches by species or group of species in tons, kilograms or number of specimens, discard and bycatch, a report of mammals and marine mammals, reptiles, penguins and seabirds with which they have interacted during the fishing operations (LODAP, article No. 162 and General Regulation, article No.225)

MPCEIP-SRP-2019-0402-M of May 14, 2019, and accepting the suggestion made by the National Fisheries Institute (IPIAP) approves and provides for the immediate and mandatory implementation of the fishing logbooks worked jointly between the IPIAP and SRP.

On the landing sites the SRP through the Directorate of Fisheries Control (DCP) carries out permanent monitoring of hydrobiological resources, applied 365 days a year under the framework of the "Monitoring, Control and Surveillance System (MCS)". All in situ procedures related to the MCS of fishery resources are applied through the Fisheries



Inspectors at the national level, to maintain proper traceability of resources, in addition to strengthening the fight against IUU fishing (MPCEIP, 2021).

In 2011 an on-board observation program was implemented (Article No. 10 of Ministerial Agreement No. 407 of October 12, 2011) stating that the program should cover 10% of the active fleet of the longline mother vessels. Therefore, in December 2011 with Ministerial Agreement No. 204 a Single Program of observers for the Ecuadorian longline fleet was created. The program provided a system of random monitoring and real time data collection on 10% of the fleet of mother vessels and the longline fishing vessels that have more than 20 meters of length.

In 2021 with the Agreement MPCEIP- SRP- 202, the observation program was updated establishing that it must provide a system for random monitoring and real-time data collection on trips made by fishing vessels using "drifting longline" fishing gear, as well as the fleet of mother-ship vessels. The monitoring will be made progressively, with 10% of trips being observed in 2022, 15% in 2023 and 20% in 2024.

Thus, **SG 60 is met** since monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.

Article 113 of the LODAP states that DMS (or VMS in English) shall be installed in all artisanal vessels for safety purposes. However, according with the information provided by the client the fiber-glass skiffs do not have the DMS installed. Fishermen consider that the DMS is too expensive and that they cannot afford it, therefore they are negotiating with the administration to receive financial aid to comply with this regulation.

More importantly, in 2019 Ecuador received a yellow card from the European Union over shortcomings in the mechanisms that the country has put in place to ensure compliance with its international obligations as a flag, port and market state. The shortcomings noted by the European Union include:

- The legal framework in place is outdated and not in line with the international and regional rules applying to the conservation and management of fishing resources.
- Law enforcement is hampered by this outdated legal framework, inefficient administrative procedures and a lenient approach towards infringements. As a result, the sanctioning system is neither depriving the offenders from the benefits accruing from IUU fishing, nor deterrent.
- There are serious deficiencies in terms of control, notably over the activity of the tuna fishing and processing industries.
- after finding that the country's regulations and procedures to combat IUU fishing do not comply with international and regional standards applicable to the conservation and management of fishery resources. In order to comply with the EU's observations, the Ecuadorian government has updated the legal framework (LODAP and its general regulations) establishing the application of sanctions with deterrent effect for illegal fishing activities, categorized from minor, serious to very serious, as well as determining a table of fines.

After the notification of the yellow card, Ecuador established a two-year action plan with three priority areas: IUU fishing, coercive measures and the promotion of the application of international standards. However, the definitive measure has been to reformulate the fishing legislation, which gave rise to the new fishing Law passed in 2020. In November 2022, the UE sent a delegation for review the yellow card. However, at the time of preparing this ACDR the yellow card has still not been lifted.

Based on the above, **SG80 is not met.**

b	Sanctions								
	Guide post	Sanctions to deal with non- compliance exist and there is some evidence that they are applied.	Sanctions to deal with non- compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non- compliance exist, are consistently applied and demonstrably provide effective deterrence.					
	Met?	Yes	No	No					
Ration	ale								

The sanctioning regime assessed in this PI is restricted to Ecuador.

With the enactment of the LODAP in 2020, the aim is to have an updated legal framework, which considers the application of sanctions and dissuasive infractions. Likewise, the SRP through the Fisheries Control Directorate has established greater control and surveillance at ports and shipping zones.

Articles 212 and 214 are detailing the fishing sanctions. Sanctions are classified as minor, serious and very serious. Penalties shall be imposed according to the following criteria: seriousness of the infraction, the nature and quantification of the damage, whether it involves fragile, protected or endangered ecosystems or species, the size and power of the vessel and quantification of the damage, possibility of restoring the damage, economic benefit obtained or expected by the alleged offender as a result of his action or omission and the existing mitigating or aggravating factors (Article No. 192, LODAP). (see 7.4.1.2)

According to the Ministerial Agreement 070 the persons who fail to comply with this normative (that regulates closed seasons, permissibility limits during the closed season, minimum size, among other management measures) will be sanctioned by the Director General of Fisheries at the administrative level, who will set aside an administrative file; and in case of guilt, the maximum sanctions established in the Fisheries Law will be applied, including the suspension of the fishing permit.

Regarding ETP species, it is determined as a serious fishing infraction to intentionally carry out fishing activities in interaction with marine mammals, sea turtles or whale sharks (LODAP, article No 213, section fishing gear, letter e).

Based on the above, SG60 is met.

Among the reasons why the EU gave Ecuador the yellow card in 2019 was that the sanctions did not have a deterrent effect because the application of sanctions was inconsistent, but since then Ecuador has issue a new Fisheries Law and reformulate the coercitive measures. However, during the preparation of the ACDR the team did not have access to detailed information on how the sanctions are applied and further information is required on this topic. Thus, at this stage the team considers that **SG80 is not met**.

	Complia	nce				
C	Guide post	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.		
	Met?	Yes	No	No		
Rationale						

The level of compliance assessed in this PI is restricted to the Ecuadorian fleet.

The position of the mother-ship vessels is controlled through the VMS installed on board. All landings have to be inspected to get the Certificate of Monitoring and Control of Fisheries Landing (CMCDP). Additionally, there is an observer Program implemented since 2011.

Based on the above the team considers that **SG60 is met.**

However, at the time of preparing this ACDR the yellow card issued by the EU in 2019 has not yet been lifted and the team did not have access to specific information on number of inspections performed and infringements found in recent years (e.g.2019-2021). Also, more detailed information on the level of compliance with VMS regulations are needed. Thus, more information should be collected at the site visit (including meetings and comments received from stakeholders) to determine the final score.



The Ecuadorian longline fleet is subject to the catch limit of 500t/year of bigeye tuna imposed through C-21-04. Bigeye tuna catches of the UoA are very low and well below that limit (see table PI3.2.3.1 below). However this catch limit is imposed to longline fleets, irrespective of the type of longline gear used. As explained in **section 5.1.3**, this fleet changes the gear during the closed season for dolphinfish as uses a different longline for targeting tunas, billfishes and sharks (LL-TBS). According to the data provided by the SRP, the catches of bigeye tuna in 2020 exceeded the limit of 500t set by C-17-02 (see table 3.2.3.1). The vessels using LL_TBS are the same vessels included in the UoA, and bigeye tuna is a bycatch of the assessed fishery.

Table PI3.2.3.1. Bigeye tuna catches of the Ecuadorian longline fleet, segregated by type of longline used: LL-DOL- thin longline or 'doradero', and LL-TBS- longline for tunas, billfishes and sharks. Table elaborated by the team using landing data provided by the SRP.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
LL_TBS	116,7	99,6	38,6	0,4	97,2	120,6	694,5	190,5	191,9	190,9
LL-DOL	9,3	0,9	7,0	18,0	2,0	13,1	0,1	0,0	1,6	0,0

At this stage the team considers that SG80 is not met.

	Systematic non-compliance	
d	Guide post	There is no evidence of systematic non-compliance.
	Met?	No
Ration	ale	

The systematic non-compliance assessed in this PI is restricted to the Ecuadorian fleet.

The client acknowledged that artisanal vessels are not complying with the mandatory use of VMS set in Article 113 of the LODAP, while no evidence has been provided in relation to the level of compliance on this topic by the mother-ship fleet.

At the time of preparing the ACDR, the team did not have access to specific information on number of inspections, infringements and sanctioned imposed in recent years (e.g.2019-2021), while the yellow card issued by the EU in 2019 has not yet been lifted. Thus, more information should be collected at the site visit (including meetings and comments received from stakeholders) to determine the final score. At this stage the team considers that **SG80 is not met.**

References

MPCEIP, 2021.

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

Draft scoring range	60-79
Information gap indicator	 More information sought: Find information about official landing areas and ports. Request specific information on number of inspections, infringements, and sanctions imposed in recent years (e.g.2019-2021). Find out if the yellow card imposed by the EU is finally lifted. Request details of the review performed by the EU in Nov 2022



	Check the possibility that the Ecuadorian LL flee had overaged the catch limit for bigeye tuna i 2020.			
Overall Performance Indicator scores added from Client and Peer Review Draft Report stage				
Overall Performance Indicator score				
Condition number (if relevant)				



PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system							
Scorin	g Issue	SG 60	SG 80	SG 100					
а	Evaluati	valuation coverage							
	Guide post	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	There are mechanisms in place to evaluate all parts of the fishery-specific management system.					
	Met?	Yes	No	No					
Rationale									

The mechanisms assessed in this PI include the ones in place at the Ecuadorian level and those relative to the bilateral cooperation between Ecuador and Peru.

The key management measures for the dolphinfish fishery in Ecuador are minimum size, closed seasons, authorized hooks (all detailed in Agreement 070 passed in 2011), and the technical specs of the fleet (detailed in Agreement 407 passed in 2011). Besides, a mandatory observer program is in place (first adopted in 2011 through Agreement 204, and recently superseded by Agreement MPCEIP-SRP-2022-A).

Besides, a National Action Plan for the dolphinfish was first designed and implemented for the period 2011-2016. This PAN was evaluated in 2013 and 2018, and a new PAN has been adopted for the period 2019-2024. The PAN is evaluated every five years, at least. The main goal of the current PAN Dorado is to ensure the conservation and sustainable use of dolphinfish resource, through the following components: i) management, government, and financial sustainability, ii) monitoring, control and surveillance, iii) education, capacity building and communication, and iv) research and development. Thus, the evaluation process of the PAN performed in 2013 and 2019 can be considered as a mechanism to evaluate some parts of the fishery-specific management system. Thus, **SG60 is met.**

However, there is no evidence that key management measures have been evaluated at National level, and all remain unchanged since 2011 (with the only exception of the observer program). Despite several bilateral meetings have been organized under the framework of the MoU signed by the two countries in 2014, there is no evidence that those forums have been used as mechanisms to evaluate key parts of the fishey-specific system. The key management measures (closed season, minimum size, authorized hooks) remain not aligned between the two countries. Thus, **SG80 is not met.**

	Internal and/or external review								
b	Guide post	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.					
	Met?	Yes	Yes	No					
Ration	ale								

The fishery-specific management system assessed in this PI is the one for Ecuador.

The PAN DORADO has a periodic internal evaluation every 5 years. Pan Dorado (2011-2016) had a mid-term evaluation that was conducted in 2013 to determine its degree of implementation and effectiveness. It should be noted that the General Regulation of the LODAP establishes the creation of a dialogue roundtable for the PAN Dorado to ensure active participation and follow-up of the actions established in the NAP, but this dialogue space has not been created yet.



The final evaluation of the first implementation period (2011-2016) should have been conducted in 2015, however, this evaluation was prepared in 2019 by two Consultants, as part of the consultancy "Evaluation of the National Action Plan for the Management of the Dorado resource in Ecuador (PAN Dorado) and update with strengthened governance arrangements", within the Coastal Fisheries Initiatives Project (CFI), implemented by the United Nations Development Programme (UNDP) and executed by the Vice Ministry of Aquaculture and Fisheries (VAP), Ministry of Environment of Ecuador (MAE), Conservation International (CI) and the World Wildlife Fund (WWF) as executing partners, thanks to funding from the Global Environment Facility (GEF). The mid-term and the final evaluation were done through a participatory process. The participatory process including scientists, the country's fisheries administration, fishermen, and civil society.

SG60 and SG80 are meet because the PAN Dorado is subject to internal review every 5 years and also occasional external review (as it was the one made in 2019). **SG100** is not meet since there is not a regular external review stablished.

References

Acuerdo Ministerial No. 023 de 14 de febrero de 2011 mediante el cual se establece el Plan de Acción Nacional para la Conservación y Manejo del Recurso Dorado de Ecuador

DORADO - IATTC Technical meetings:

https://www.iattc.org/Meetings/Meetings2015/DOR-02/pdfs/Docs/_Spanish/DOR-02-RPT_2a-Reunion-Tecnicasobre-el-dorado.pdf

https://www.iattc.org/Meetings/Meetings2015/DOR-02/2ndTechnicalMeetingDoradoSPN.htm https://www.iattc.org/Meetings/Meetings2014/DOR-01/1stTechnicalMeetingDoradoSPN.htm

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

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

Draft scoring range	≥80
Information gap indicator	 More information sought: Get more details on the expected date to implementation of the fishery-specific dialogue roundtable. Get more insight on the external reviews of the PAN-Dorado Get more insight on whether effectiveness of current management measures has ever been evaluated: when, how, what info was used

Overall Performance Indicator score	
Condition number (if relevant)	



7.4.3 Principle 3 references

IATTC 1990. Inter-American Tropical Tuna Commission Rules of Procedure. APPENDIX 1 (jattc.org)

MPCEIP, 2019. Plan de Acción Nacional para la conservación y el manejo del recurso dorado en Ecuador (PAN Dorado 2019-2024). MPCEIP, Ecuador. 47pp.

MPCEIP. 2021. Reporte de acciones de seguimiento, control y vigilancia realizadas durante el periodo de veda por reclutamiento para el recurso dorado (Coryphaena hippurus) en Ecuador: temporada 2021.

MINJUS, 2016. Guía sobre la calidad normativa y publicación de proyectos normativos. Guía para asesores jurídicos del Estado. Ministerio de Justicia y Derechos Humanos. MINJUS. Lima.

MoU 2014. Memorandum de Entendimiento en materia pesquera y acuícola entre el Ministerio de la Producción de la República de Perú y el Ministerio de Agricultura, Ganadería, Acuacultura y Pesca de la República del Ecuador.

Roa-Ureta, RH, Amancio, GR, Abanto, PM, Izquierdo, IG, Sior, AAN, Elías, E, Peralta, M. 2022. Stock Assessment of the dolphinfish (Coryphaena hippurus) in the South-East Pacific Ocean. IATTC Doc SAC-13 INF-O. 40 pp.

WWF, 2019a.Evaluación del Plan de Acción Nacional para la Conservación y el Manejo del Recurso Dorado en Ecuador (PAN Dorado) 2011-2016



8 Appendices

8.1 Assessment information

8.2 Stakeholder input

To be drafted at Client and Peer Review Draft Report stage

The CAB shall use the 'MSC Template for Stakeholder Input into Fishery Assessments' to include all written stakeholder input during the stakeholder input opportunities (Announcement Comment Draft Report, site visit and Public Comment Draft Report). Using the 'MSC Template for Stakeholder Input into Fishery Assessments', the team shall respond to all written stakeholder input identifying what changes to scoring, rationales and conditions have been made in response, where the changes have been made, and assigning a 'CAB response code'.

The 'MSC Template for Stakeholder Input into Fishery Assessments' shall also be used to provide a summary of verbal submissions received during the site visit likely to cause a material difference to the outcome of the assessment. Using the 'MSC Template for Stakeholder Input into Fishery Assessments' the team shall respond to the summary of verbal submissions identifying what changes to scoring, rationales and conditions have been made in response, where the changes have been made, and assigning a 'CAB response code'.

Reference(s): FCP v2.2 Sections 7.15, 7.20.5 and 7.22.3



8.2.1 Small-scale fisheries

As described in section 5.1.3, this fishery is performed by an 'oceanic-artisanal' fleet. It is estimated that nodriza-based operations produce as much as 80% of the total catches of the artisanal fishery (Martinez-Ortiz et al, 2015). The remainder is produced by independent fibras operating within 200NM from the baseline, Martinez-Ortiz et al. (2015)).

According to MPCEIP (2022b), in 2022 a total of 2,844 fiberglass skiffs were registered and authorized to target large pelagic species (using either longline or gillnets), while the number of motherships is 244 (of which 140 are artisanal and 104 are industrial).

Article 152 of Executive Decree N°362 passed in February 2022 sets that for all legal purposes, all vessels that operate as nodrizas will be subject to the legal regime applicable to industrial vessels. However, for the purpose of this section, the entire fishery could be considered as artisanal.

Table 8.1.1.1 – Small-scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
UoA1	All mother-ship vessels are above 12m in length, while all fiberglass skiffs are under that size.	Most of the fishery takes place outside the 12NM, even the independent fiberglass skiffs reach further searching for fishing grounds.



8.3 Evaluation processes and techniques

8.3.1 Site visits

The CAB shall include in the report:

- An itinerary of site visit activities with dates.
- A description of site visit activities, including any locations that were inspected.
- Names of individuals contacted.

Reference(s): FCP v2.2 Section 7.16

If the client proceeds to announce the assessment of the fishery, this ACDR will be published at the MSC website together with the announcement that the fishery is entering the assessment process, in accordance with FCP7.12.1. Dates, type (on-site/off-site) and itinerary of the site visit will be detailed at the announcement of the fishery.

Thus, this section will be completed at Client and Peer Review Draft Report

8.3.2 Stakeholder participation

The CAB shall include in the report:

- Details of people interviewed: local residents, representatives of stakeholder organisations including contacts with any regional MSC representatives.
- A description of stakeholder engagement strategy and opportunities available.

Reference(s): FCP v2.2 Section 7.16

This section will be drafted at Client and Peer Review Draft Report and completed at Public Certification Report.

8.3.3 Evaluation techniques

At Announcement Comment Draft report stage, if the use of the RBF is triggered for this assessment, the CAB shall include in the report:

- The plan for RBF activities that the team will undertake at the site visit.
- The justification for using the RBF, which can be copied from previous RBF announcements, and stakeholder comments on its use.
- The RBF stakeholder consultation strategy to ensure effective participation from a range of stakeholders including any participatory tools used.
- The full list of activities and components to be discussed or evaluated in the assessment.

At Client Draft Report stage, if the RBF was used for this assessment, the CAB shall include in the report:

- A summary of the information obtained from the stakeholder meetings including the range of opinions.
- The full list of activities and components that have been discussed or evaluated in the assessment, regardless of the final risk-based outcome.

The stakeholder input should be reported in the stakeholder input appendix and incorporated in the rationales directly in the scoring tables.

Reference(s): FCP v2.2 Section 7.16, FCP v2.2 Annex PF Section PF2.1

This section will be completed at Client and Peer Review Draft Report.

The assessment process will follow the MSC Fisheries Certification Process v2.2, and using the default assessment tree (Annex SA) of the MSC Fisheries Standard, v2.01. All public announcements will comply with FCP v2.2.

The assessment team has completed this ACDR mainly using the information provided in the Client Document Checklist, together with information from public sources such as the following websites: IATTC, SPRFMO, IUCN, ACAP. Also, several remote meetings were held with the client during January and February 2023 in order to discuss information gaps and needs



Each assessor drafted his/her own background and scoring sections (i.e. Lisa Borges prepared section 7.2, Natalia Mora and José Ríos prepared together Section 7.4, and José Ríos prepared Section 7.3 and all other sections -sections 3, 4, 5, 6 and 8-). These drafts were exchanged through email, so all team members had the chance to provide feedback on others sections. Some remote teams meetings were held to discuss scorings. All scores in this ACDR were adopted by consensus among all the team members. Once all background and scoring sections were agreed, the Team Leader compiled all documents in a single draft report which was shared among all team members for a final review and feedback.

Use of RBF

(i) Justification

A comprehensive list of all species impacted by all UoAs is presented in **section 7.3.1.1**. This list includes 50 different species and taxa of cartilaginous fish, teleost, and marine turtles. Among all these P2-species, 24 were considered to be Data Deficient species, either because there are no biologically based limits established and the status remains unknown, which is the case of 12 secondary species; or, in the case of the ETP species, because the impact of the UoA cannot be analytically determined due to the low observer coverage and poor data. This is the case of all ETPs species (with the only exception of the silky shark which is subject to national and international limits).

The secondary species listed here: Pompano dolphinfish (*Coryphaena equiselis*), wahoo (*Acanthocybium solandri*), black skipjack (*Euthynnus lineatus*), striped bonito (*Sarda orientalis*), black marlin (*Istiompax indica*), Indo-Pacific sailfish (*Istiophorus platypterus*), short bill spearfish (*Tetrapturus angustirostris*), escolar (*Lepidocybium flavobrunneum*), pelagic stingray (*Hypanus longus*), longtail stingray (*Pteroplatytrygon violacea*). RBF shall be triggered for assessing their status against this SI. However, PF4.1.4 allows the team to avoid conducting RBF on 'minor' species when evaluating PI2.1.1 or 2.2.1 as far as final PI score is adjusted downward according to clause PF5.3.2. Due to the high number of different species to be assessed as minor secondary species the assessment team decided to take this option.

A total of 12 ETP species were classified as Data-Deficient: oceanic whitetip shark (*C.longimanus*), Scalloped hammerhead (Sphyrna lewini), great hammerhead (*S.mokarran*), bonnethead (*S.tiburo*), smooth hammerhead (*S.zygaena*), Spotted eagle ray (*Aetobatus laticeps*), Rays (*Mobula spp.*), Loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), hawkbill turtle (*Eretmochelys imbricata*), and olive Ridley turtle (*Lepidochelys olivacea*). Besides, protected seabirds (albatrosses and petrels) and marine mammals overlapping with the UoA are also ETP components that shall be assessed despite no interactions have been reported by the observers. All these components were classified as DD, and RBF shall be triggered to assess them.

(ii) Activities

If the client proceeds to announce the assessment of the fishery the PSA for the species detailed above would be carry out during the site visit.

(iii) Consultation strategy

The team will follow requirements included in Annex PF regarding Announcement of the RBF and information gathering prior to the visit. This information will be shared with attendees straight after the announcement on the use of RBF, together with other supporting materials prepared to help stakeholders to understand the RBF process (Annex PF, a tailord guide on the use of the PSA, and a PPT on the MSC process and the use of the RBF and the PSA in particular). The team will consult the following stakeholders in relation to the use of the RBF: the client, PRODUCE, IPIAP, WWF-Peru, WWF-Ecuador. The language of the consultation will be Spanish, and all the documents related to the RBF will be prepared in Spanish to facilitate engagement.

The information gathered during stakeholder consultations will be used to inform the scoring of the PSA.



8.4 Peer Review reports

To be drafted at Public Comment Draft Report stage

The CAB shall include in the report unattributed reports of the Peer Reviewers in full using the relevant templates. The CAB shall include in the report explicit responses of the team that include:

- Identification of specifically what (if any) changes to scoring, rationales, or conditions have been made; and,
- A substantiated justification for not making changes where Peer Reviewers suggest changes, but the team disagrees.

Reference(s): FCP v2.2 Section 7.14



8.5 Conditions

8.5.1 Conditions

To be drafted at Client and Peer Review Draft Report stage

The CAB shall document in the report all conditions in separate tables.

Reference(s): FCP v2.2 Section 7.18, 7.30.5 and 7.30.6

Table 8.5.1.1 – Condition 1

Performance Indicator	
Score	State score for Performance Indicator.
Justification	Cross reference to page number containing scoring template table or copy justification text here.
Condition	State condition.
Condition deadline	State deadline for the condition.
Exceptional circumstances	Check the box if exceptional circumstances apply and condition deadline is longer than the period of certification (FCP v2.2 7.18.1.6). Provide a justification.
Milestones	State milestones and resulting scores where applicable.
Verification with other entities	Include details of any verification required to meet requirements in FCP v2.2 7.19.8.
Complete the following row	vs for reassessments.
	Check the box if the condition is being carried over from a previous certificate and include a justification for carrying over the condition (FCP v2.2 7.30.5.1.a).
Carried over condition	Include a justification that progress against the condition and milestones is adequate (FCP v2.2 7.30.5.2). The CAB shall base its justification on information from the reassessment site visit.
Related condition	Check the box if the condition relates to a previous condition that was closed during a previous certification period but where a new condition on the same Performance Indicator or Scoring Issue is set.
	Include a justification – why is a related condition being raised? (FCP v2.2 7.30.6 & G7.30.6).
Condition rewritten	Check the box if the condition has been rewritten. Include a justification (FCP v2.2 $7.30.5.3$)

8.6 Client Action Plan

To be drafted at Public Comment Draft Report stage

The CAB shall include in the report the Client Action Plan from the fishery client to address conditions.

Reference(s): FCP v2.2 Section 7.19

8.7 Surveillance

To be drafted at Client and Peer Review Draft Report stage

The CAB shall include in the report the program for surveillance, timing of surveillance audits and a supporting justification.

Reference(s): FCP v2.2 Section 7.28

Table 8.7.1 – Fishery surveillance program

Surveillance level	Year 1	Year 2	Year 3	Year 4
e.g. Level 5	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit & re-certification site visit

Table 8.7.2 – Timing of surveillance audit					
Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale		
e.g. 1	e.g. May 2018	e.g. July 2018	e.g. Scientific advice to be released in June 2018, proposal to postpone audit to include findings of scientific advice		

Table 8.7.3 – Surveillance level justification				
Year	Surveillance activity	Number of auditors	Rationale	
e.g.3	e.g. On-site audit	e.g. 1 auditor on-site with remote support from 1 auditor	e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.	



8.8 Risk-Based Framework outputs

To be drafted at Client and Peer Review Draft Report stage

8.8.1 **Productivity Susceptibility Analysis (PSA)**

The CAB shall include in the report an MSC Productivity Susceptibility Analysis (PSA) worksheet for each Performance Indicator where the PSA is used and one PSA rationale table for each data-deficient species identified, subject to FCP v2.2 Section PF4. If species are grouped together, the CAB shall list all species and group them indicating which are most at-risk.

Reference(s): FCP v2.2 Annex PF Section PF4

Table X – PSA productivity and susceptibility attributes and scores			
Performance Indicator			
Productivity			
Scoring element (species)			
Attribute	Rationale	Score	
Average age at maturity		1/2/3	
Average maximum age		1/2/3	
Fecundity		1/2/3	
Average maximum size Not scored for invertebrates		1/2/3	
Average size at maturity Not scored for invertebrates		1/2/3	
Reproductive strategy		1/2/3	
Trophic level		1/2/3	
Density dependence Invertebrates only		1/2/3	
Susceptibility			
Fishery Only where the scoring element is scored cumulatively	Insert list of fisheries impacting the given scoring element (FCP v2.2 7.4.10)	Annex PF	
Attribute	Rationale	Score	
Areal Overlap	Insert attribute rationale. Note specific requirements in FCP v2.2 Annex PF4.4.6.b, where the impacts of fisheries other than the UoA are taken into account	1/2/3	



Encounterability	Insert attribute rationale. Note specific requirements in FCP v2.2 Annex PF4.4.6.b, where the impacts of fisheries other than the UoA are taken into account	1/2/3
Selectivity of gear type		1/2/3
Post capture mortality		1/2/3
Catch (weight) Only where the scoring element is scored cumulatively	Insert weights or proportions of fisheries impacting the given scoring element (FCP v2.2 Annex PF4.4.4)	1/2/3

Table X – Species grouped by similar taxonomies (if FCP v2.2 Annex PF4.1.5 is used)						
Species scientific name	Species known)	common	name	(if	Taxonomic grouping	Most at-risk in group?
e.g. Genus species subspecies					Indicate the group that this species belongs to, e.g. <i>Scombridae,</i> <i>Soleidae, Serranidae, Merluccius</i> <i>spp.</i>	Yes / No



8.9 **Objection Procedure – delete if not applicable**

To be added at Public Certification Report stage

The CAB shall include in the report all written decisions arising from the Objection Procedure.

Reference(s): MSC Disputes Process v1.0, FCP v2.2 Annex PD Objection Procedure

