

Sustainability Toolkit for Cephalopod Fisheries

CEPHS & CHEFS Project



Technical information

Title: Sustainability Toolkit for Cephalopod Fisheries: CephS & Chefs Project

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About Ceph & Chefs



In 2017, the INTERREG Atlantic Area European funding programme funded the project **Ceph & Chefs** – “**Octopus, Squid, Cuttlefish, Sustainable Fisheries and Chefs**”¹ which has the overall aim of promoting sustainable fishing on octopus, squid and cuttlefish.

The four main objectives of the Ceph & Chefs project are to:

- a) **Add value to cephalopod products**, by developing and promoting new products, new market initiatives (e.g., certification) and business opportunities for the sector;
- b) Improve knowledge of the **value chain** (“from sea to table”), the factors affecting sustainability in the short term (e.g., low prices, imports, consumer demand), and **potential market developments** in the long term;
- c) Improve knowledge of the **eating habits** of, and acceptance of **new cephalopod food products** by consumers in Northern and Southern Europe;
- d) Ensure the **sustainability of the fishing activity** by assessing the status of stocks, fisheries and ecosystems based on biological indicators.



¹<https://www.cephsandchefs.com>

In the **Atlantic Area**, fishing for cephalopods has a regional flavour. For example, the fisheries for common octopus (*Octopus vulgaris*) are very important in the South – in regions such as the Algarve (Portugal), Galicia and Andalusia (Spain) – where they form the basis of traditional cuisine. Squid and cuttlefish are also important, but less so than octopus. On the other hand, in Northern countries (Ireland and United Kingdom), squid fisheries (mainly for veined squid *Loligo forbesii*) are much more important. In addition, in the English Channel, cuttlefish fisheries (for common cuttlefish *Sepia officinalis*) also play an important role for France and the United Kingdom (UK), along with European squid (*Loligo vulgaris*) and veined squid.

As quotas for many finfish stocks are insufficient to meet demand, often because of past overexploitation, there is the need to stimulate consumers in the North to eat alternative sources of sustainable seafood – which could include octopus, squid and cuttlefish. Ceph & Chefs worked with chefs (including chefs of the future via Institutes of Technology such as the School Culinary Arts & Gastronomy of Galway-Mayo IT), to raise the profile of this delicious and healthy seafood among the general public (see Ceph & Chefs Recipe Book²), while ensuring that they are fished sustainably. In the South, new products such as smoked octopus were developed as interesting alternatives to add value to this fisheries resource.

In the Ceph & Chefs project, we have also tried to understand the importance of octopus, squid and cuttlefish in global value chains, as well as conducting consumer surveys to identify people's eating

habits, barriers to and drivers of consumption of cephalopods, and people's preferences for and perception about sustainable labelling initiatives. A summary of the main achievements can be accessed in the Booklet "Market Opportunities for Octopus in the Atlantic Area"³ and on the project's webpage (<https://www.cephsandchefs.com>).

To ensure everything is done sustainably, a large part of the research has been analysing data collected from landings, via the Europe Union (EU) Data Collection Framework, and fisheries surveys in the relevant fishery areas (International Council for the Exploration of the Sea (ICES) fishery divisions 4, 6, 7, 8 and 9), to examine status and trends.

In order to encourage cephalopod fisheries along the pathway towards sustainability, we developed a **Sustainability Toolkit for Cephalopod Fisheries**. This document was developed to engage cephalopod fishery and value chain stakeholders who are seeking (or already) following a pathway to sustainability. Our main aim is to provide information for stakeholders in the fishing industry and value chain, as well as for scientists, managers, regulatory authorities and governments, in the form of a simple, step-by-step, guide to how cephalopod fisheries can enter a Fishery Improvement Project (FIP) and achieve the Marine Stewardship Council (MSC) certification.

²<https://www.cephsandchefs.com/recipe-book/>

³<https://www.cephsandchefs.com/booklet/>

How to Achieve Sustainability for Cephalopod Fisheries?

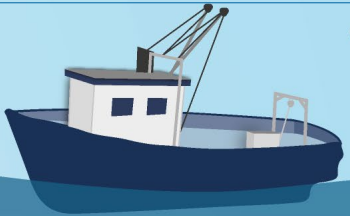
Firstly, we should try to define **sustainability** in cephalopod fisheries. In principle the definition of a sustainable fishery has long since been expanded to include not just the status of the fished stock but also the environment in which it lives, and the economic and social benefits provided by the fishery, in terms of income and employment. Nowadays even broader definitions are discussed, including consideration of human health, food security, traceability of products, the cultural value of fishing and animal welfare. In practice, even though an “ecosystem-based approach to fisheries” is gradually being introduced in Europe, the focus of fishery management advice still remains how much can be caught each year. For cephalopods, there are usually no limits on total catches, although a myriad of regulations applies to small-scale fisheries catching cephalopods in southern Europe.

The commercially important cephalopods in Europe mainly belong to four families: Octopodidae (octopuses), Sepiidae (cuttlefish, with which we may group their small relatives the Sepiolidae), Loliginidae (longfin squid) and Ommastrephidae (shortfin squid). The Loliginidae is the only group that is important to fisheries throughout Europe. Cuttlefish are fairly rare in the northernmost parts of Europe, with the highest catches coming from the English Channel. There is currently relatively little commercial interest in octopuses and shortfin squid in northern Europe, although the ommastrephid *Todarodes sagittatus* supported an important fishery in Norway in the 1980s. In the case of octopuses, the most important species in European fisheries,

common octopus (*Octopus vulgaris*), is rare in northern Europe, being an important fishery in southern Europe.

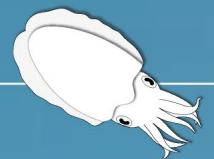
The four groups share similar life-cycles, mainly living for around 1-2 years and their abundance is generally both very seasonal (depending on the life stage) and highly variable from year to year. Successive generations usually do not overlap, so that removing all recruits or all spawning adults in a given year will cause a stock to disappear. This also means that abundance usually declines steadily from recruitment to spawning (e.g. typically from autumn to spring in *Loligo forbesii*). Another common feature is highly variable adult size (and differences in the size of males and females) so that minimum landing size regulations may not do much to protect the spawning stock (although they should help ensure that so-called growth overfishing does not take place). All cephalopods are extremely sensitive to environmental variation, which can affect their abundance, distribution, body size and the timing of the life-cycle.

There are also important differences between the four groups, which affect the best ways to catch them and the best approaches to management, e.g., related to the likely geographical extent of individual stocks (which basically increases from octopus, via cuttlefish and longfin squid to shortfin squid), the likelihood that discarded individuals will survive (which probably decreases from octopus through cuttlefish to squid), the habitat and the relevance of protecting spawning areas:



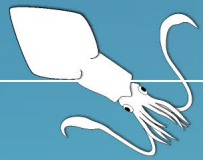
Octopus

Octopuses show little movement once the planktonic early life stages move to the seabed to settle down, hence it is difficult to define specific spawning or feeding grounds. They can be taken by bottom trawling but southern European SSF mainly catch them in pots. Since they lay their eggs on the seabed, trawling can destroy the eggs.



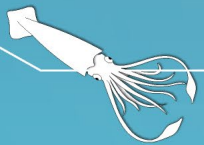
Cuttlefish

Cuttlefish are migratory, and mainly demersal in their habits and are fished by trawling as they move towards their spawning grounds and using traps on the spawning grounds, as occurs in the English Channel. One issue with the traps is that cuttlefish often lay their eggs inside the traps and these eggs are often destroyed in the process of hauling and cleaning the traps.



Longfin squids

Longfin squids are also migratory demersal species and are taken by bottom trawling once they are big enough to be caught in the nets, as well as by hand-jigging in coastal waters of southern Europe. Again, the eggs are laid on the seabed – and sometimes on fixed gear – so both use of fixed nets and trawling in spawning areas may destroy the eggs.



Shortfin squids

Shortfin squids are mainly pelagic species. They undertake long migrations between breeding grounds and feeding grounds and lay floating egg masses

Relevant differences among the main cephalopod groups

Monitoring, Assessment and Management of Fisheries

The bedrock of sustainable fishing is the **monitoring-assessment-management cycle**, but this presumes that we have defined the stock which is being fished and the fishery which is doing it, and several other components should also be considered:



Stock definition

Evidently stocks (or populations) should be defined so that we know what it is we are monitoring and assessing. It may appear to be convenient to monitor (say) “French” longfin squid but it is almost impossible that these are separate from “British” longfin squid. Much work still needs to be done to define cephalopod stocks, for example by studying their genetic make-up, morphology or life history attributes.



Monitoring

Ideally, monitoring will follow the whole life-cycle of each generation of a stock, certainly from recruitment to spawning. Recruitment surveys, e.g. based on research trawling, can be very useful to help predict subsequent abundance. Regular (at least monthly but preferably weekly) on-board or market sampling will allow the progress of growth and maturation to be followed and (if fishing effort is known) can provide an abundance index, which will allow the decline of the annual stock due to fishing to be followed and, if necessary, halted.



Assessment

Most assessment approaches which have been trialled in cephalopods provide retrospective assessments which, in a short-lived species are not very helpful to predict future abundance, even one year ahead. Nevertheless, they can help indicate whether the current level of fishing is sustainable (and most such exercises for European cephalopods have suggested that this is the case, at least for the stocks and areas under consideration). The best assessment solution probably is the application of “depletion methods”. Numerical abundance will inevitably decline over the course of the lifespan of each generation and monitoring this decline can provide an indication of when it would be good to stop fishing to ensure that sufficient adults survive to spawn. Currently only one cephalopod fishery in Europe (Asturias octopus) applies this approach. In others there is no routine assessment of the stock. It would also be useful to implement forecasting based on predictive models (e.g., based on environmental conditions) and/or surveys of recruitment, since this could help decide the appropriate amount of fishing effort for the next season.



Current management

In large-scale commercial fisheries there is little or no limitation on how many cephalopods can be caught, even when cephalopods are targeted. Trawlers may use smaller mesh nets if targeting squid. In directed small-scale cephalopod

fisheries, again there are usually no catch limits but there are numerous regulations including closed seasons, minimum landing sizes and restrictions on the amount and type of fishing gear which can be deployed, which undoubtedly help protect the stocks but which, in the absence of assessment, are not responsive to changes in abundance.

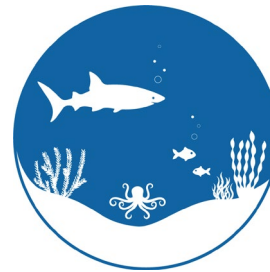


Future management

For target species of both large-scale and small-scale fisheries, if forecasting, recruitment surveys and/or “depletion” assessment can be introduced, limitations on effort or catches could be introduced, e.g. setting the number

of licences at the start of the season and having the option to close the fishing season once the stock falls below a certain level. Where cephalopods are not the target (usually in mixed fisheries) it is less useful to set such limits unless it can be accepted that this will affect catching of other species. In addition, protection of the spawning areas of those species which lay their eggs on the sea-bed would be a useful contribution, bearing in mind that these eggs may be present for several months until they hatch so that a short closed season may not be very useful. Above all, it is important to avoid a free-for-

all (as has happened with catching English Channel cuttlefish) since that is when overfishing is most likely. It is also important to note that even the best managed cephalopod fishery is likely to show highly variable production, so that the whole value chain, from producer to consumer must be resilient to such variation.



State of the marine environment

A sustainable fishery implies an ecosystem which is in good health. While such information is rarely collected in relation to fisheries it is collected in response to European marine conservation directives, and the availability

of such information can help ensure that fishing is not causing important damage to the ecosystem.



Economic and social costs and benefits of fishing

In principle it is reasonable to factor in the likely long-term social and economic costs and benefits of increased or decreased fishing when carrying out assessments, formulating scientific

advice and making management decisions, even if the systems in place for managing fisheries in Europe do not formally include such a step, so that (at least in large-scale fisheries for “quota” species) such considerations tend to come into play after the advice has been issued but before it is implemented. Evidently the costs and benefits arising from a fishery are contingent on the maintenance of the

resource on which it depends, and perhaps the most important and obvious point to make is that short-term increases in catch quotas above the amount recommended in the advice, supposedly to help preserve jobs and income in the production sector, rarely improve sustainability in the long-term, even in terms of the stated rationale for implementing them.

It is recommended that, insofar as it is practical to do so, fishery management should also aim to take into account a range of other factors relevant to sustainability, including (in no particular order) food safety and handling, product traceability, workplace conditions and safety, food security, cultural values, the carbon footprint, animal welfare, human rights, gender equality and illegal practices of all kinds.

In the end, sustainable fishing benefits us all, and it is essential that the voices of all interested stakeholders are heard, including those of the general public, and equally that all stakeholders recognise the legitimate rights of other stakeholders to hold a view. Some authors have stated that sustainable fishing is an example of a “wicked” problem, one not amenable to any easily achievable solution - and we may allow that no solution will satisfy everybody. Nevertheless, for relatively novel fishery resources such as cephalopods in European waters, for which management systems have not been fully evolved, we have an opportunity develop new and better approaches to achieving sustainability.

Additional information can be found on the Cephs & Chefs policy brief: <https://www.cephsandchefs.com/policy-brief/>



Roadmap to MSC-Certification

The FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries⁴ define certification as “a procedure by which a third party gives written or equivalent assurance that a product, process or service conforms to specified requirements”. In general, certification must address, through the direct engagement with fisheries stakeholders and the supply chain, the social and environmental challenges that must be overcome by the fisheries so to achieve a verified level of performance⁵. The Marine Stewardship Council (MSC)⁶ is the largest certifier of seafood globally, but only focus on environmental sustainability. Achieving sustainability and market recognition is a journey that implies investment in consolidating and improving management measures, increasing research and knowledge and optimizing control and monitoring systems. Therefore, appropriate management of these aspects is a must to obtain any credible certification. For this reason, although obtaining a certification could be understood as a single event, in fact it implies an evolutionary process with intermediate milestones and a need to engage with all relevant actors and interested parties linked to a fishery. To illustrate this step-wise approach, we present here the certification process recognised by the MSC certification program as a reference. The **steps to achieve MSC-certification** are described below.



⁴ FAO Fisheries and Aquaculture Dep., Rome (Italy). Guidelines for the ecolabelling of fish and fishery products from marine capture fisheries. FAO, Rome (Italy), 2009.

⁵ https://certificationandratings.org/wp-content/uploads/2019/06/Sustainable_Seafood_A_Global_Benchmark.pdf

⁶ <https://www.msc.org/for-business/fisheries>

Step-by-step to MSC-Certification

1



Pre- Assessment (not mandatory, but recommended)

The process starts by undertaking a baseline analysis of the environmental performance of the given fishery against the MSC Standard for Sustainable Fisheries. This first analysis is known as the pre-assessment. This preliminary stage allows identification, in a very detailed manner, of the strengths and weaknesses of the fishery and, therefore, helps to make any decision about progressing towards the formal certification process or investing efforts to improve certain areas of management, before facing the formal certification.

Once the pre-assessment delivers a promising outcome, the fishery might enter the full assessment process to try to achieve the MSC certification. The time-lapse between the initial pre-assessment and entering the full assessment process will necessarily depend on the environmental performance of the fishery and its readiness and capacity (including financial capacity) to achieve the requirements of the MSC Fishery Standard. This might imply few months or several years, depending on the degree of improvements necessary. It is recommended to update any pre-assessment results at least every 3 years in order to make decisions based on the most recent available knowledge.

2



Action Plan for Improvements (not mandatory, but recommended)

Where the pre-assessment reveals important gaps and demands improvements, the fishery might need to develop an action plan to guide these improvements, the completion of which may take several years. This might be best delivered through involvement of interested stakeholders and support of the industry, in some cases recognizing these efforts as part of a Fishery Improvement Project or FIP (see following section).

The MSC offers guidance for how to develop this type of initiative, recommending a time-bound, goal-oriented plan that systematically addresses the areas identified for improvement, identifies roles and responsibilities across stakeholders, and offers an approach for monitoring and publicly reporting progress via the Benchmarking and Tracking Tool. Actions may require activities such as improved information, new monitoring programs or specific impact evaluations which entail cooperation with researchers; they may require that the fishers change how they deploy their gear or change it to reduce harm to the environment or to bycatch species, which may rely on the adoption of technological innovations; or may require new management plans or control rules that will entail cooperation with managers and/or other

fishers operating in the area.

These are often collaborative efforts that require many interested parties to work together towards a common goal. Certification can represent the incentive that helps bring these disparate actors together.

3



Full Assessment

The full assessment exercise, following international best practices and guidelines, is an independent third-party audit undertaken by accredited entities and trained experts that entails the analysis of the fishery against the 28 performance indicators of the MSC Fisheries Standard. These indicators are structured in three main areas, or principles:

- 1) Target stock sustainability;
- 2) Environmental impacts;
- 3) Fishery management system.

After compiling and answering stakeholders' comments and peer reviewers' oversight, the independent entity would reach a conclusion about the compliance (or not) of the fishery with MSC requirements. Following that conclusion, the MSC certificate will be granted (or not). The full assessment analysis takes an average of 14 months of work. Thus, it is strongly encouraged

that a fishery attempt to do this only once they believe they are performing well from stock status, environmental impacts and management process perspectives. For this reason, a pre-assessment is a recommended preparatory step.

4



Certification

The MSC certification lasts up to five years and is subject to annual surveillance audits. If the certification process found that the fishery met sustainability requirements but not did not achieve best practice for a limited number of performance indicators, the fishery can be certified conditionally.

5



Surveillance Audits and Closing Conditions

The surveillance audits will verify progress towards the agreed targets. If the fishery was certified conditionally, it must make the specified improvements to achieve best practice, i.e. 'close the conditions'. If the fishery is found to no longer meet sustainability requirements and, therefore, is not adequately implementing the improvement actions agreed upon when the certification was approved, certification will be suspended.

6



Re-Assessment

The certificate expires after five years and the fishery will need to go through a new assessment to become re-certified. There are two types of re-assessment: (i) the full re-assessment, which requires all the steps carried out during the initial full assessment; and (ii) the reduced re-assessment, for fisheries with no outstanding conditions by the end of the third audit, with all stakeholder issues solved, and when the re-assessment is covered under the previous certificate.

7



Re-Certification

To obtain the re-certification, the fishery has to pass the re-assessment.

An example of one of the four MSC-certified cephalopod fisheries, the Western Asturias Octopus Trap Fishery, with a timetable of the steps followed to achieve certification is presented.



The MSC-Certified Western Asturias Octopus Traps Fishery

The Western Asturias Octopus Fishery was the first **MSC-certified cephalopod fishery** in the world and it is still the only one in European waters. Certified in 2016, this small-scale fishery integrates 29 boats targeting *Octopus vulgaris* using traps. The certificate is managed by an association (ARPEOS) including boats from seven different guilds in Asturias, landing in five different ports. In 2010, this group of fishers' guilds, supported by the Local Rural Development Action Group, undertook an analysis of the challenges faced by the fishery and decided to work towards MSC certification. The support of the Asturias fisheries administration (Dirección General de Pesca Marítima) and especially its advice centre (Centro Experimentación Pesquera) was fundamental to meet this ambitious goal. The steps to date are summarized below:

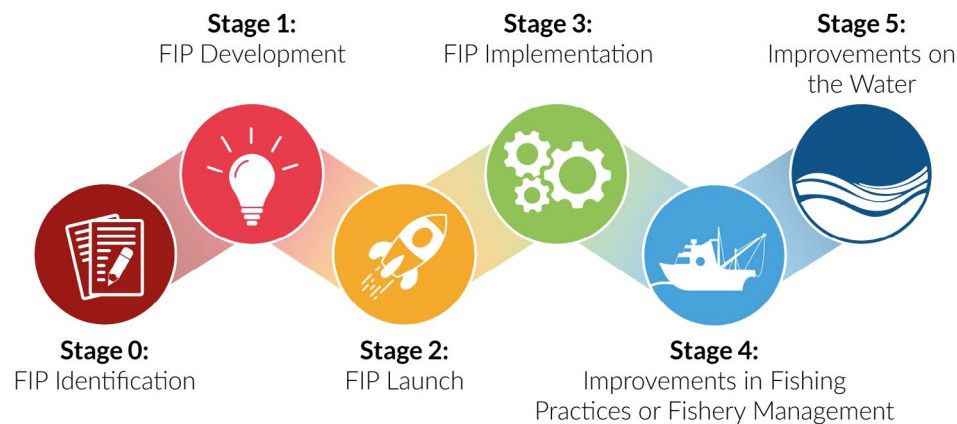
Pre-Assessment (Sep. 2013 – Feb. 2014)	● Gap analysis to identify weak points and obstacles in the fishery and the likelihood of achieving the certification.
Preparation of the Fishery (Mar.–Sep. 2014)	● Implement measures to improve weaknesses before starting the certification process. Collection of information of fishery impact on species, habitats and ecosystem starts.
MSC Full Assessment (Dec. 2014 – Feb. 2016)	● Analysis to assess the fishery against the MSC Standards of Fisheries and Chain of Custody.
MSC Certification (Feb. 2016)	● MSC certification obtained.
Action Plan (2016 – 2020)	● Implement measures to meet the four conditions raised in the certification in order to improve the sustainability of the fishery.
1st Annual Surveillance Audit (ASA) (2017)	● An Octopus Fishery Monitoring Commission is created as a consultative body for the management plan; Stakeholders (fishers, administrators, NGOs, scientists) work together.
2nd ASA (2018)	● GPS/GPRS tracking devices are installed on all vessels to determine the fishing areas/fishing effort. The fishery has almost ready two possible Harvest Control Rules (HCR) to be tested.
3rd ASA (2019)	● New objectives have been incorporated to the management plan related to the sustainability of the stock and the impact on other species.
4th ASA (2020)	● Another evaluation of the fishery started.
MSC Re-Assessment (started Nov. 2020)	● A stock assessment was done for the first time. Implementation of: new decision-making process; a marking program with ID seals; surveillance protocol.
Site visit (2021)	● The fishery has established a HCR based on the stock assessment. The Monitoring Control & Surveillance system demonstrates its ability to eliminate excessive fishing effort in the fishery.



What are Fishery Improvement Projects (FIPs)?

A **Fishery Improvement Project (FIP)** is a “multi-stakeholder effort to address environmental or social challenges in a fishery”⁷. The main goals of FIPs are to enable the supply chain to recognize those particular fisheries actively working to overcome their sustainability challenges, and to attract market stakeholders to support those fisheries and projects. Although there is no established best practice to develop FIPs, various such initiatives exist, aiming to assure the quality, homogeneity, robustness and credibility of these projects. The most authoritative source is FisheryProgress⁸, which is a collective effort to compile public information about FIPs around the world and to standardize the way improvements and progress towards sustainability goals are measured and reported.

FisheryProgress recognizes six FIP stages:



⁷<https://solutionsforseafood.org/resources/fishery-improvement/>

⁸<https://fisheryprogress.org/>

⁹<https://www.cephsandchefs.com/booklet/>

According to status FIPs can be active, inactive or completed.

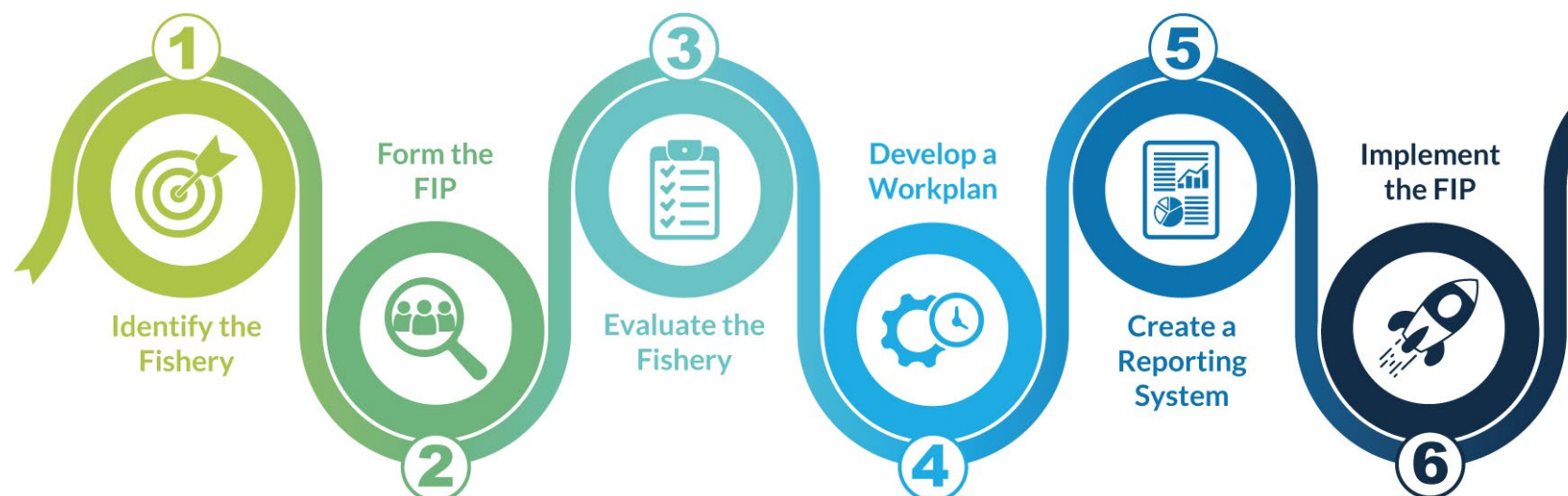
According to depth of the analysis and goals, FIPs can be prospective, basic or comprehensive. **Prospective FIPs** are either in stage 0 or 1 and intend to achieve stage 2 within one year. **Basic FIPs** are a good way for fisheries to start addressing specific environmental challenges to improve their performance against the MSC Fisheries Standard, while **comprehensive FIPs** aim to address all the fishery’s environmental challenges in order to achieve an unconditional pass of the MSC Fisheries Standard. If a fishery aims to enter a comprehensive FIP, a MSC pre-assessment is mandatory. **Active FIPs** are currently implementing their workplan and reporting progress to FisheryProgress. FIPs become **Inactive** if they suspend the work before achieving their goals or fail to submit progress reports (i.e., fail to submit a yearly report or three years of insufficient progress). On the other hand, if the FIP meets all their objectives or has graduated to MSC full assessment, it is considered a **Completed FIP**.

A total of 11 FIPs for cephalopod fisheries are currently ongoing, two basic and nine comprehensive FIPs, none of them in European waters. A map of these (and other) initiatives can be found in the Ceph & Chefs Booklet⁹. In the following pages, stepwise guidelines on how to enter a FIP is presented.

Roadmap to Enter a FIP

Although the benefits of achieving certification can potentially be significant, the costs and the duration of the process may make it seem impracticable for some fisheries, e.g., for small-scale fisheries in developing countries. Moreover, some fisheries have many issues and, as a consequence are unlikely to meet the MSC Fisheries Standards without substantial improvements. For these fisheries, FIPs offer means to improve fishing practices, enhance management and engage stakeholders until they achieve a level of sustainability consistent with certification. There may also be economic benefits in the short-term as fisheries in a FIP may have access to key markets that are interested in buying seafood from these sources, in recognition of their efforts to achieve sustainability even if sustainability has not been achieved yet.

In general, **FIPs are multi-year projects with specific sustainability objectives** to be achieved, formalized by one-to-one meetings and a scoping document: the Memorandum of Understanding (MoU). The MoU defines the specific roles and responsibilities of each stakeholder and reinforces the partnership among the parties. A FIP includes multiple fishery stakeholders – fishers, other actors from the supply chain, fishery managers and authorities, scientists, and non-governmental organisations (NGOs), who will collaborate to achieve the FIP's objectives. Next, we briefly describe the steps to enter a FIP, according to the Sustainable Fisheries Partnership (SFP)¹⁰.



¹⁰<https://www.sustainablefish.org/News/Sustainable-Fisheries-Partnership-Launches-the-Seafood-Industry-Guide-to-FIPs>

Step-by-step to Enter a FIP



1 Identify the Fishery

The identification and selection of the fishery to enter a FIP can be initiated by retailers, processors, producers, buyers or any organization closely related with the fishery, which may consider a series of criteria, such as: commercial importance of the fishery, its impacts on the environment, consumer awareness, the amount of investments to achieve positive results, among others.



2 Form the FIP

While forming the FIP, it is important to engage as many stakeholders as possible. The stakeholders can be involved as formal participants (e.g., providing active guidance and funds, attending meetings) or informal participants (eventual input and assistance). A written document (usually the MoU) is recommended to formalize roles and responsibilities.



3 Evaluate the Fishery

The evaluation of the fishery consists of identifying its weaknesses and specific areas for improvement. This can be done through a formal MSC pre-assessments (in the case of comprehensive FIPs) or a simpler approach, e.g., through the FishSource Rapid Assessment Program or a gap analysis comparing requirements for certification with the current status of the fishery.



4 Develop a Workplan

The workplan sets out the actions for improvement and timelines. If a MSC pre-assessment was done, the workplan will be based on addressing the weaknesses identified in this document, and therefore aligned with an MSC action plan. However, if the information about the fishery is limited, the workplan will focus on addressing fundamental data deficiencies and improvement activities to achieve these data.



5 Create a Reporting System

A public report system (via FisheryProgress) is essential to ensure the progress of the actions from the workplan. Regular periodic reports will allow all stakeholders to access the information about the fishery and will give the FIP credibility with the seafood supply chain and potential buyers.



6 Implement the FIP

Implementing the FIP means putting the workplan into action. It is recommended to try to achieve some solid results within one year of the FIP launch, since this demonstrates that the FIP is generating genuine and measurable benefits for the sustainability of the fishery.

An example of a FIP, the Southwest Madagascar Octopus Fishery and a timetable of the steps followed until the FIP's launch, is presented.

The Southwest Madagascar Octopus Fishery

The Southwest Madagascar day octopus (*Octopus cyanea*) diving and gleaning fishery is the subject of a **Comprehensive FIP** (2019), the first and only one in the country. The fishery is managed through the Velondriake Locally Managed Marine Area (LMMA) by Vezo (“the people who fish”) fishing communities. Octopus fishing is crucial for the livelihood of the Vezo people, particularly women, for whom there are few other ways of earning money, and the fishery has become a key driver of economic and subsistence activity in the region. The FIP is led by Blue Ventures (BV) in collaboration with multiple partners via the Comité de Gestion de la Pêche aux Poulpes (CGPP). The fishery takes place in 32 villages, engaging around 2,400 fishers and landing around 22 tonnes (€18,600) of octopus every year, mainly exported to the EU. BV has been involved with this fishery for almost 20 years, supporting the community in the steps towards sustainability and improving local livelihoods.

1st Velondriake Closure (Nov. 2004)	● A 7-month octopus fishing closure on a shallow reef was implemented for the first time in Andavadoaka, based on a traditional law, known as 'Dina', agreed upon by communal consensus. Catches and fisher incomes were higher when the fishery re-opened.
1st National Closure (2005)	● The national government formalized the community initiative by closing the entire southwest region octopus fishery for 1.5 months. A minimum catch weight (350 g) was also imposed.
1st LMMA established (2006)	● Velondriake LMMA was created, becoming the country's first LMMA, which was governed by a network of 25 fishing villages.
More Conservation & Fishing Measures (2006-2008)	● More ambitious coastal management efforts were set in motion, leading to the banning of destructive fishing practices, engagement in ecological monitoring, and the establishment of the first permanent community-enforced no-take area.
Data Collection Program (2011)	● Blue Ventures established an on-going data collection program in the LMMA; collecting data on fishing effort, catches, CPUE, sales, weights and biological data are collected.
MIHARI (2012)	● A Madagascar LMMA Network (MIHARI) was established in 2012 to facilitate networking and learning exchanges between LMMAs.
Stock Assessment (2018)	● A stock assessment of the Octopus fishery in Southwest Madagascar was carried out, indicating a stock status below full exploitation, and not over-fished.
MSC Pre-assessment (Oct. 2018)	● A MSC pre-assessment was completed, indicating the weak points to work on in the near future, including the harvesting strategy, fishery impacts on species and habitats, the decision-making process, compliance and enforcement.
FIP Launched (Jan. 2019)	● A comprehensive FIP (2019-22) was launched, incorporating several NGOs, the CGPP, the Madagascar fisheries administration (DREAP & SRPA) and the exporting industry. The FIP is making good progress, with 27% of the actions already completed by March 2021.



The Algarve Octopus Pot & Trap Fishery

The Algarve Octopus Pot & Trap Fishery is a small-scale fishery in the South of Portugal, that has considerable social and economic importance for livelihoods in this region. The Portuguese octopus fishery faces several challenges, especially those related to its governability – including lack of compliance, illegal fishing practices, inappropriate monitoring and assessment of the resource, among others – but also those related to the biology of the species and the fluctuations in its abundance due to environmental influences¹¹.

Several efforts have been made in the last few years to collect information and improve our understanding of the fishery and fishing practices (e.g., the Tertúlias do Polvo, ParticiPESCA project, among others). Aiming to evaluate the current status of the Algarve Octopus Fishery and propose concrete actions for improvement, the Cephs & Chefs project carried out a **MSC pre-assessment** and an **Action Plan**¹², respectively. The fishery does not meet the requirements of MSC certification at this point, and it would need to implement some improvements to increase its environmental performance. If considered, these improvement actions could be structured within a FIP. A summary of the main findings of the MSC pre-assessment and the Action Plan are presented below.



¹¹Pita, C., et al. "The traditional small-scale octopus fishery in Portugal: framing its governability." Interactive governance for small-scale fisheries. Springer, Cham, 2015. 117-132.

¹²<https://www.cephsandchefs.com/outcomes/work-package-6/>

MSC Pre-Assessment

The Unit of Assessment (UoA) includes all fishing boats using pots and traps for common octopus *Octopus vulgaris* in the Algarve region, south of Portugal. The fishery involves around 500 active vessels, mostly less than 9 metres in length and working within 6 nautical miles of the coast. The Algarve Octopus Fishery has passed (scored ≥ 80) on 13 of the 28 MSC performance indicators (PIs) under Principles 1, 2 and 3 (P1-P3). However, the fishery has several significant weaknesses and was therefore considered not consistent with the MSC Fisheries Standard. The fishery has automatically failed 6 PIs (< 60) and the other 8 PIs (scored between 60-79) would require conditions to improve. The main **strengths and weaknesses** of the fishery are summarized below:

	Strengths (PIs scored ≥ 80)	Indicators to improve (PIs scored 60-79)	Weaknesses (PIs scored < 60)
P1 Sustainable Stocks	<ul style="list-style-type: none"> Although there is no information on stock status, nor reference points for the Algarve octopus, a Risk-Based Framework Assessment was carried out. 	<ul style="list-style-type: none"> There are no specific stock management objectives, while the harvest strategy is not responsive to the state of the stock. The Algarve octopus stock is not at a Maximum Sustainable Yield (MSY). 	<ul style="list-style-type: none"> There are no generally understood harvest control rules available or in place that may limit stock exploitation. Monitoring of stock abundance is lacking.
P2 Environment Impacts	<ul style="list-style-type: none"> The fishery is selectivity, bycatch almost non-existent. The light nature of the gear has limited and non-permanent impact on the seafloor. Seafloor maps provide sufficient information on the nature of affected habitats. Information on both trophic relationships and ecosystem interactions available for the UoA. 	<ul style="list-style-type: none"> There is no information on the interactions and the impacts of the fishery on endangered, threatened and protected species (ETP) species. There are uncertainties on the implementation of management measures on habitat protection. There are uncertainties on the impact of octopus removals in the region. There are uncertainties on the impacts of lost gears on the ecosystem. 	<ul style="list-style-type: none"> There are no specific management measures to avoid interactions of ETP species with the fishery, no recording of such interactions, and no review of alternative measures to minimise these interactions.
P3 Fisheries Management	<ul style="list-style-type: none"> The fishery is in line with European and Portuguese fisheries law. There are clear long term precautionary and MSY objectives in the European and Portuguese fisheries law. There are monitoring systems in place to evaluate the fisheries management system. 	<ul style="list-style-type: none"> Consultation roles and responsibilities are well defined and clear, but there is no regular formal consultation process. 	<ul style="list-style-type: none"> There are no clear fishery specific objectives for the Algarve octopus pot and trap fishery. There is a lack of compliance with fisheries' laws necessary for the sustainability of the fishery. The Monitoring, Control and Surveillance mechanisms implemented are not effective.

Action Plan

The Action Plan proposed for the Algarve Octopus Pot & Trap Fishery (April 2021) aims to **address the weaknesses** identified in the MSC pre-assessment, i.e. in relation to those indicators for which the scores did not reach the level of good practices required by the MSC Fisheries Standard (≥ 80), that inevitably will need improvement actions. For the Action Plan, the same UoA was considered, thus, it includes all fishing boats using pots and traps to catch common octopus in the Algarve region. In this Action Plan, six actions (with estimated conclusion dates) were proposed:

- Action 1:** ● This action aims to: i. obtain regular monitoring of catches from the fishery with pots and traps (both target catches and by-catch); ii. obtain the real number of pots and traps used; iii. identify the total areas of operation of the fishery. These data are essential for a possible quantitative assessment of stock status, assessment of the impact of fisheries on endangered, threatened and protected species (ETP), the establishment of management measures, the prevention of illegal fishing and the removal of illegal sets, and an environmental impact assessment of the fishery.

Fisheries monitoring improvement
(Conclusion date: Oct. 2023)
- Action 2:** ● Based on data collected in action 1, time series of Catches per Unit of Effort (CPUE) will be estimated using the official landings data for octopus and the actual estimated fishing effort. At the same time, a study of the possible models to assess the state of the octopus stock at the level of the Algarve region will be carried out, taking into account the particularities of the octopus' biological cycle and assessments carried out in other populations. Finally, all the information collected so far will be combined with the biological data and the status of the Algarve's octopus stock will be determined.

Stock assessment
(Conclusion date: May 2024)
- Action 3:** ● Co-management is currently enshrined in Portuguese law (Decree-Law no 73/2020), which establishes the procedure for creating and operating co-management committees. The project "Tertúlias do Polvo" (2014–2016) established monthly meetings involving fishery stakeholders (fishing industry, government, NGOs, scientists) to discuss management measures. The ParticiPESCA project, currently underway (Oct. 2020–Dec. 2022), aims to implement co-management in this fishery, promoting the direct involvement of local communities in decision-making to achieve the sustainability of the fishery.

Co-management implementation
(Conclusion date: Dec. 2022)
- Action 4:** ● Decree-Law no 73/2020 Article 17 allow for management plans to be developed and approved by the co-management committees. Thus, the co-management committee established in action 3 will develop the management plan in this action, which should have specific objectives, catch control rules and tools that respond to stock status, and measures to reduce the environmental impact of the fishery - namely to decrease interactions with ETP species and prevent the loss of pots and traps in the sea (ghost fishing).

Management plan development
(Conclusion date: Dec. 2024)
- Action 5:** ● There is evidence that the fishery repeatedly violates several fisheries laws concerning the sustainability of the fishery, namely the minimum landing size for octopus and the maximum number of pots and traps permitted. Based on the geolocation and catch data from the fishing activity, collected in action 1, the control and enforcement of the management measures changed and/or agreed in the co-management committee (action 4) can be improved, in particular through the elimination of illegal sets of gears.

Monitoring, control and surveillance
(Conclusion date: Dec. 2026)
- Action 6:** ● This action aims to reinforce the implementation of the management measures agreed by the co-management committee and, at the same time, reinforce fisheries control and enforcement. It is developed through a chain of custody awareness campaign, to ensure that restaurants and buyers do not buy octopus below the minimum size. This campaign should complement and be carried out in conjunction with the campaigns planned within the ParticiPESCA project, which aim at raising awareness among the general public, and will extend beyond the completion of this project.

Awareness of Chain of Custody
(Conclusion date: Dec. 2024)

Final Highlights

While there are many definitions of sustainability, it is fundamental that the fished population and its environment are maintained in good condition and that the fishery can deliver real long-term social and economic benefits. FIPs and certification programmes are predicated on the fact that achieving sustainability can deliver socio-economic benefits as well as environmental benefits, not only by preventing overfishing and collapse of the stock on which the fishery depends, but by generating receptive markets that will recognize these efforts by purchasing its products. This is true both for fisheries managed under the EU Common Fishery Policy's quota system and those fisheries (like cephalopod fisheries in EU waters) which fall outside that system. It is possible that a top-down approach of including fishing for cephalopods under the Common Fisheries Policy could achieve greater sustainability but FIPs and certification offer an alternative, bottom-up, route to the same goal.

Certification schemes do not escape criticism (the lack of social issues¹³ or the high price of certification are probably the main critics) but – much like top down fishery management – they can deliver sustainability if due diligence is applied to ensure that participants do not break the rules. The value of the concepts of FIPs and certification is not undermined by failures or instances of loss of certification – the fact that such issues come to light and can be addressed is a positive feature. We would argue that it is better to work towards sustainable

fishing than to dismiss it as an impossible goal.

Thus we support the role of FIPs and certification in the development of fishing for cephalopods and we ask fishers, value chain actors, relevant authorities and the public to play their part in delivering sustainable cephalopod fisheries.



¹³ Fishery Progress has just created a "Social Responsibility Assessment Tool".
<https://fisheryprogress.org/social-responsibility/social-responsibility-assessment-tool>

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