

ASSESSING PILOT STUDIES UNDER EU-MAP 2017- 2019 (2020-2021)

PILOT STUDY 2: LEVEL OF FISHING AND IMPACT OF FISHERIES ON BIOLOGICAL RESOURCES AND MARINE ECOSYSTEM

REPORT

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Introduction

0. Foreword

Under the EU MAP 2017-2019, Member States (MS) have executed pilot studies on four different areas of data collection: (1) recreational fisheries, (2) impacts on marine ecosystem, (3) employment data and (4) aquaculture environment. The descriptions of these pilot studies are shortly included in the work plans and annual reports. DG MARE intends to make an in-depth analysis of the outcomes and progress of the pilot studies - those already finished 2017-2019 and those still running for 2020-2021.

The Commission requested MS to submit a detailed but concise report in English (maximum 30 pages) with description of each pilot study (aim, methodology, available results, inclusion (or not) in regular sampling, difficulties encountered during the implementation, lessons learned and additional useful information). MS submitted their pilot studies reports by March 2021. However, some reports came later and/or did not follow the proposed format for the report.

The Commission then requested STECF to evaluate the pilot study reports, in first instance through specific ad-hoc contracts and then through the STECF Plenary. After endorsement by STECF PLEN, all reports will be publically available on the DCF website under the annual reports and work plans section.

STECF EWG 21-09 reviewed the final report from the ad-hoc contracts related to fisheries impacts on the ecosystem in June 2021. After their comments, the COM decided to redraft it before publication to take into account the suggestions made by the EWG. This redraft has been done by DG MARE.

1. Background

Member States (MS) have collected data under the EU MAP¹ to *assess the impact of the European Union fisheries on marine ecosystem¹, with a focus on the level of fishing and impact of fishing activities on marine biological resources and on marine ecosystems.*

Importantly, MS also have obligations outside the DCF under other legislative acts including the Habitats Directive (92/43/EEC), the Birds Directive (2009/147/EC), the Marine Strategy Framework Directive (2008/56/EC) and the Regulation on the conservation of fisheries resources and the protection of marine ecosystems through technical measures (2019/1241/EU). Member States also have commitments through international agreements like ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas) or ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area). Therefore, much more knowledge is available for the different topics covered in the pilot studies than what the Member States have expressed in the present pilot study reports.

¹ Chapter III, point 3 of the Commission Implementing Decision (EU) 2016/1251.

Some of the pilot studies have most likely been carried out to meet requirements from multiple legislative acts and not solely the DCF (data collection framework, Regulation (EU) 2016/1007). This also pinpoints the need for developments towards a better understanding of impact on fisheries on the marine environment, carried out in the framework of DCF to be aligned with other approaches within the Member States and at regional level.

Pilot studies were performed by the following Member States: Bulgaria (BG), Croatia (HR), Cyprus (CY), Denmark (DK), Finland (FI), France (FR), Germany (DE), Greece (EL), Ireland (IE), Italy (IT), Lithuania (LT), Malta (MT), Portugal (PT), Romania (RO), Slovenia (SI), Spain (ES) and Sweden (SE). Belgium (BE) and Estonia (EE) were excluded from the review by the independent experts as they sent a text, in which Belgium explained its participation in the regional coordination group (RCG) and Estonia communicated that the collection of this information is already included in their regular sampling scheme.

From the STECF EWG 21-09, it became clear that there was a need to highlight a regional approach (e.g. the GFCM criteria followed by MS from the Mediterranean and Black Sea) to the pilot studies. The report also needs to put more emphasis on best practices of MS in order to ensure replicability of possible approaches or methodologies.

There are many lessons to learn from these pilot studies performed by the MS, and could be shared amongst the MS or in relevant regional coordination groups. This report therefore aimed to modify the text created by the experts and highlight positive aspects such as best practices.

2. Terms of References

The reported pilot studies were evaluated by a group of experts according to the following Terms of References (ToRs):

ToR 1: Review of the supporting reports and documents on pilot studies provided by the Member States.

The text documents contain: objectives; duration; geographical scope; material and methods, including fishing and monitoring/sampling effort, fleet selection, sampling protocol / observer manual, inclusion of deterrent devices, etc.; outcomes and results, including achievements and deviations, difficulties encountered and lessons learned; and inclusion into regular sampling or not with justifications.

ToR 2: Draft a single and harmonised document containing an evaluation and a comprehensive summary of the main outcomes of the pilot studies in fisheries impact on the seabed (1); incidental catch of unwanted species (2); and stomach content (3). This document should then highlight achievements and best practices, and whether it could be shared and extended amongst Member States or relevant regional coordination group.

3. General comments on the evaluations process

The evaluation encompassed 36 pilot studies from 17 Member States (Table 1). Three main themes became apparent from the performed pilot studies. Almost half of the studies covered

the topic of incidental catch of unwanted species (including protected, endangered, threatened or sensitive species, PETs); others on fisheries impact on the seabed; and studies on predator-prey relationship supported by stomach sampling.

Next to these three themes, MS also performed studies on varying topics related to the general impact of fishing on marine resources. These covered a wide range of topics such as the characterization of national fisheries to better fit future sampling programs to management needs (BG, IE, ES), a framework aiming to develop methods that could generate MSY (maximum sustainable yield) reference points or proxies for data limited stocks (IE), approaches to mixed fisheries analysis (EL), or tagging schemes to assess the retention-ban as a conservation measure for oceanic whitetip shark (FR, ES, PT).

3.1 Main achievements (including best practices)

3.1.1 Regional approaches

Mediterranean- and Black Sea

Several countries in the Mediterranean and Black Sea made a good starting point in creating a common, standardized methodological approach.

Data from the Mediterranean International Bottom Trawl Survey (MEDITS) provided input to study PETs bycatch, but also diet composition (e.g. of Hake by IT and EL). Almost all MS in the Mediterranean and Black Sea basins performed pilot studies that focused on incidental catch of PETs, and used the GFCM criteria on incidental catch as common methodology (BG, FR, CY, EL, HR, IT, MT, RO). This in turn allowed for a standardized, regional monitoring approach. Some MS will continue to improve this approach, and discuss issues like vessel coverage and species identification through the Regional Coordination Group Mediterranean and Black Sea (RCG Med&BS).

As for stomach sampling programs, the use of a common sampling protocol at the Mediterranean level was explored. Methodologies were described in the WKSTCON² 2018 report (EL) and in the EU MARE/2014/19 project³ (EL, HR, IT, MT). More information from other geographical sub areas (GSAs), on for instance seasonal and spatial feeding habits, could improve the sampling program and bring it to the EU level.

North Atlantic, and Baltic- and North Sea

No regional sampling program was mentioned in pilot studies performed for incidental catch in the North Atlantic, Baltic or North Sea. Many MS already have experience in methodologies used for their national sampling programs (e.g. DK, SE).

² Report Workshop on sampling, processing and analysing the stomach contents (WKSTCON) 24-27 April 2018 Palma de Mallorca, Spain.

³ EU MARE/2014/19 grant project Strengthening regional coordination in the area of fisheries data collection in the Mediterranean and Black Sea. [MARE 2014-19 strengthening regional cooperation - European Commission \(europa.eu\)](https://ec.europa.eu/mare/2014-19-strengthening-regional-cooperation)

Many MS in this sea basin performed seabed studies by using a wide array of methodologies, and the absence of a regional approach was not seen as an issue by MS.

One MS however mentioned a regional approach for stomach sampling, which was conducted by the Regional Coordination Group North Atlantic, North Sea and Eastern Arctic (RCG NANSEA). This aimed to improve data on natural mortality for its use in multi-species modelling and stock assessments. Further development in the regional coordination could benefit a successful sampling program for the North Sea and Skagerrak.

3.1.2 Inclusion of incidental catch in standard sampling

Many pilot studies have increased the understanding of bycatch, especially of protected, endangered or threatened species (PETs). The knowledge gained under the pilot study and possible future systematic sampling will be in turn very useful for the formulation of possible management measures for minimizing incidental catch of vulnerable species where occurring.

The types of bycatch ranged from marine mammals to seabirds, sea turtles, elasmobranchs and macro benthos. The topics of the studies included an array of methodological approaches to understand the level of bycatch in fisheries. These approaches include at-sea observations (e.g. BG, RO), questionnaires (HR, CY, LT), use of cameras (FR), email surveys (FI), on-shore survey (ES, FR), and self-reporting (IE, MT, FI, LT).

The increased understanding resulted from pilot studies that focused on the implementation of the monitoring program on bycatch of vulnerable species, the acquisition of in-depth information on the species incidentally caught, as well as their quantities, locations and the timing of such catches (e.g. SI, ES). Based on the outcomes, systematic sampling and ad-hoc monitoring program may be proposed.

The sampling activity was included in national work plans of most MS at the end of the pilot study period (CY, HR, EL, DK, FI, IE, PT, RO, SI, SE, BG). Some Member States focused on fisheries that were already covered by routine sampling programs (FR, DE, MT), while others extended the sampling to fisheries that were not yet covered by routine sampling.

3.1.3 Increased understanding of species interactions

Another achievement by several MS (EL, DE, FR, IT) was the increased understanding of species interactions. Several pilot studies provided valuable information to improve stomach sampling programs and protocols, which could help in the evaluation and study of predator-prey relations. Different MS focused on different aspects of such relations. Italy for instance performed a study on the trophic food chain and different life cycle phases of the European hake, while France conducted a stomach sampling program to study diet composition and feeding ecology of elasmobranchs. The latter showed that stomach sampling requires good collaboration with the industry, and provides supplementary data to at-sea surveys at a low cost.

3.1.4 Analysing impact of fisheries on the seabed

Several MS increased the use and analysis of data collected to support better understanding of the impact of fisheries on the seabed (e.g. DK, DE, IE, LT). Some of the best practices were from MS that used VMS⁴ data (IE), connected logbooks with VMS data and AIS⁵ (DK) or used historical data already collected under the DCF (PT, SI).

Ireland, for instance, conducted a trial study with alternative VMS systems that indicate when the gear is actively used rather than tracking the vessel activity. This was considered relevant for the small-scale coastal fisheries (SSCF) as it improves the understanding on how the SSCF interacts with other sectors that utilize the same coastal zone. Another example from Portugal showed that long data time series, which already exist for several MS resulting from DCF, can be used to describe and assess changes in benthic communities. Portugal used historical data from groundfish surveys to identify changes in spatial differentiation of communities over different latitudes and depths. This approach allows for good management of coastal areas and the conservation of biodiversity as it enables to define ecological areas suitable for monitoring and assessment.

3.2 Difficulties encountered (and solutions found)

3.2.1 Covering sampling effort

A difficulty encountered by several countries was with regard to the sampling effort needed to allow for a sufficient coverage of the bycatch (e.g. to get precise estimates of the total bycatch per fleet). Several MS decided to support their current data collection/surveys under the national sampling program by testing alternative ways of collecting data. As a solution, MS thereby used different data collection methods to increase the sampling effort. Such methods required collaboration with the industry, and included self-reporting through (electronic) logbooks by the vessel crew (IE, DK, CY, FI, IT, LT and MT) or methods designed by specialists to allow for data collected through on-shore interviews (CY, IT), questionnaires (ES, HR, CY, LT) or email surveys (FI).

Self-reporting was seen by many MS as a successful means to increase the monitoring of bycatches (ES, IT, HR, CY, EL, FI). This approach can thus provide additional data in cases where standard at-sea surveying activities are limited. This does require continuous training of fishers, and frequent communication between technical staff and fishers. The distribution of logbooks and promotion of self-sampling will then allow for a significant increase in the quality of information on the by-catch of vulnerable species.

Even though the use of self-reporting boosts the fleet coverage and give a minimum estimate of the discard, it will remain important to crosscheck the data originating from logbooks, interviews, questionnaires and on-shore sampling. This can be done with data from email surveys, observers/cameras on board or using fishery independent data. Finland for instance used a thorough email survey to verify figures of self-reported bird bycatches. Using email

⁴ VMS, vessels monitoring systems

⁵ Automatic identification system

surveys to collect data was considered a quick, but also cheap way to generate knowledge on by-catch in comparison with observer schemes. Crosschecking was also done with data from observer schemes (CY, EL, HR), which could help to understand the robustness of self-reported data. This however requires adequate training of scientific observer to ensure appropriate species identification and data handling.

Another issue for some MS was with regard to the coverage of the fisheries per métier. In the standard observer program, gillnetters are often covered to only a small degree. Some MS therefore included gillnetters in their pilot study (EL, IE, FR, DK, SI, ES, SE). Some MS mentioned difficulties in coverage of the gillnetter fleet because of ‘swapping’ between métier, which was mainly the case for small-scale fisheries (FR, DK).

3.2.2 Common structure missing

There were several differences in structuring and presenting information in the report, which made it difficult to evaluate the pilot studies in a harmonized manner. Some countries did not use the common structure provided by the COM in the request to report the outcomes of the pilot studies. Results (e.g. number of bycatch species, individuals, rate of bycatch) and the amount of coverage effort (e.g. number of planned and achieved observations, and vessel selection) were often missing from the report. This made it difficult to assess whether the original expected outcomes were achieved.

Table 1. Number of pilot studies under the different topics for each MS (some pilot studies cover multiple topics and these have been evaluated as independent pilot studies for each topic covered).

MS	Fisheries impact on seabed	Incidental bycatch of unwanted species (PETS, non-quota species etc.)	Stomach content	Other topics focusing on level of fishing and impact on biological resources and marine ecosystem
Bulgaria		1		1
Croatia		1		
Cyprus		1		
Denmark	1	1		
Finland		1		
France		2	1	
Germany	1		1	1
Greece	1	1	1	
Ireland	2	1		1
Italy		2	1	
Lithuania	1	1		1
Malta		1	(1)	
Portugal		1		1
Romania		1		1
Spain		1		1
Slovenia		1		
Sweden		1		

(1) = Not results/data, period, species, were present in the pilot study. Only a reference to the methodology

4. Member States summary of pilot study and report evaluation

Bulgaria

Bulgaria, has conducted a first pilot study in 2017 aimed to estimate the effect of *Rapana venosa* fishery (with beam trawlers) on the juvenile stages of bottom fish species, such as turbot (*Scophthalmus maximus*) and spiny dogfish (*Squalus acanthias*).

The second study, performed during 2018-2019, aimed to collect for the target catches, bycatch (i.e. discards and incidental catch) of marine organisms by the main types of activities of the Bulgarian fisheries' fleet:

- turbot fishery with gillnets;
- pelagic and bottom species fishery with pelagic trawls;
- *Rapana* fishery with beam trawls;
- pelagic and bottom species fishery with polyvalent gears.

The pilot studies are generally comprehensive, and MS has correctly followed the common agreed structure to report the requested information. References to regional protocols (e.g. FAO, 2019) and scientific guidelines on incidental catch and discards are clearly reported. Fishing effort and monitoring/sampling effort is well detailed: in 2017, 20 fishing days of observations and 104 hauls were performed on fishing vessels with beam trawls. During 2018 - 2019, the total number of scientific observations on board of fishing vessels included 122 fishing days divided for the different fishing activities.

Results are also clearly detailed with maps of the different sampling stations reporting information on the distribution of the catch composition, and detailed info (e.g. abundance, distribution, length size, ratio, etc.) on both main commercial species, discards, and data on the few incidental catch of vulnerable species (e.g. *Dasyatis pastinaca*). Two sturgeons' specimens, the beluga sturgeon (*Huso huso*), were caught and released alive during 2017 - 2018. No deviations from planned activities is reported.

Overall, MS reported that the scientific observations on board of fishing vessels allowed the collection of data on the quantities and biodiversity of catches, on discards and incidental catch, as well as information on age, size and sex structure of the main species. Bulgaria mentioned that main difficulty encountered during the pilot studies was building trust in fishermen. MS considers this a necessary prerequisite to fulfill the scientific observations onboard the fishing vessels.

Bulgaria reported that the benefits of the first study (i.e. bycatch in *Rapana venosa* fishery with beam trawls), providing a piece of completely new information on the composition, quantities and biological parameters of bycatch in Bulgarian Black Sea waters has been assessed positively, therefore MS took measures to expand the scope of the monitoring survey (to include several fishing segments), as the collected information could be useful for more complete reporting of catches.

Member State:	Bulgaria, report evaluation		
Topic of pilot study	Evaluation of discards (beam trawl) and bycatch (beam trawls gillnets, pelagic trawls, polyvalent vessels)		
Reference year(s):	2017-2019		
Duration of pilot study:	3 years		
Metier(s):	beam trawls (2017), beam trawls, gillnets, pelagic trawls, polyvalent vessels (2018-2019)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	Objectives are clearly reported
Duration	Yes	Yes	
Description of area of application	Yes	Yes	The area (GSA 29) is described, maps of investigation are reported, for the future a short description of the ports could be added
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	MS reported clear tables with the fishing effort and the monitoring effort per each metier and MS reported also maps of the area with the distribution of the scientific observations
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	
Sampling protocol / observer manual	Yes	Yes	References to regional protocols (FAO, 2019) and guidelines on incidental catch and discards are clearly reported
Inclusion of excluder or deterrent devices etc	Yes	NA	There is not any mention to the use of deterrent devices. It was out of the scope of the pilot study

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	MS reported all the results with the bycatch rate for the main species by fishery and year. Discards were not registered during the study in 2018-2019, and bycatches consisted mainly of fish, mollusks and crustaceans.
Deviation from planned with justification	Yes	Yes	No deviations from planned activities
Difficulties encountered	Yes	Yes	MS reported that main difficulty was creating trust in fishermen. MS considers this a necessary prerequisite to fulfill the scientific observations onboard the fishing vessels.
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	MS reported that the benefits of the first study in 2017, providing a piece of completely new information on the composition of the bycatch fraction in <i>Rapana venosa</i> fishery with beam trawls. Therefore, MS took measures to expand the scope of surveys (to include several fishing segments), as the collected information could be useful for more complete reporting of catches as well as in decision-making in the sector management.

Croatia

Croatia conducted a pilot study the period from 2018 to 2020 covering:

2018 - Pilot study for assessing incidental catches of vulnerable species from bottom trawlers.

2019 - Pilot study for assessing incidental catches of vulnerable species from longlines.

2020 - Pilot study for assessing incidental catches of vulnerable species from set nets (gillnets).

The collection of data on incidental catches of sensitive and vulnerable species was based on the methodology described in the FAO/GFCM protocol “*Monitoring of incidental catches of vulnerable species in Mediterranean and Black Sea fisheries*” (FAO, 2019), and also on the outputs of the EU MARE/2014/19 project for the Med&BS. Data that have been collected concern the identification of species, the number and weight (when possible) of individuals, the gear specifications, the location and timing of catches.

MS has partially reported the information in the common format. It is not presented a clear description of the investigated GSA, no information on the main characteristics of the area are reported (e.g. ports, sea bottoms, fleet characteristics, etc.); there is no description on the effort employed and, on the planned coverage (MS reported only that “*coverage for each métier is reported in Annual Reports for each year*”); no mention on the sampling coverage (e.g. number of planned onboard observations, questionnaires, etc.); no results on the bycatch are reported. It is reported only the achieved numbers: MS mentioned that monitoring bottom trawl fisheries was carried out in 2018 on 33 on board and 72 landing sites; monitoring longlines was carried out in 2019 on 43 boarding sites; during 2020 monitoring gillnets was carried out on 37 boarding sites. However, no results on the bycatch of vulnerable specimens were reported.

Croatia reported that there was no deviations in comparison to the national work plan. Main problem were related to the cooperation with fishermen in all métiers. MS highlighted the need to educate fishermen about the purpose of recording incidental catches and additional motivation to ensure good and continuous cooperation for scientific monitoring. Other issue is related to the unidentified species of sharks. When sharks are caught on the hook during the competition, they are soon released alive by cutting the line making it hard to identify. Most of these releases are recorded, as competitors have to declare fish on a hook and eventual subsequent release.

Croatia reported that training of scientific observers is needed to ensure appropriate handling and identification of vulnerable species and benthic organisms. MS reported that the incorporation of the results of the pilot studies into regular sampling will be in accordance with the recommendations of relevant expert groups under RCGMed&BS, RCGLP and relevant RFMOs (GFCM and ICCAT). Where needed, sampling effort will be increased in order to increase coverage of fishing effort through observers on board.

Member State:	Croatia, report evaluation		
Topic of pilot study	Monitoring incidental catch of vulnerable species		
Reference year(s):	2018-2020		
Duration of pilot study:	3 years		
Metier(s):	Trawlers (2018), longlines (2019), trammel net (2020)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Partly	Reading only this section, the objective of the study it is not clearly described, there is no mention on the fleet investigated
Duration	Yes	Yes	MS should report the duration of the pilot studies under the right section
Description of area of application	Yes	Partly	It is mentioned only that the area of application is the GSA 17. No information on the main characteristics of the area are reported (e.g. ports, sea bottoms, vessels)
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Partly	In the report, there is no description on the effort employed and, on the coverage. MS reported that “ <i>coverage for each métier is reported in Annual Reports for each year</i> ”
Fleet selection and vessel selection with observers on board coverage	Yes	Partly	MS reported that on board sampling is carried out during fishing activities according to the National Fisheries Sampling Plan. The selection of métiers was made by cumulative analysis of the annual catch. However, there is no mention on the sampling coverage (e.g. number of planned onboard observations, questionnaires etc.)
Sampling protocol / observer manual	Yes	Yes	MS mentioned that both the FAO 2019 protocol and the EU/Mare/2014/19 project have been followed
Inclusion of excluder or deterrent devices etc	Yes	NA	There is not any mention to the use of deterrent devices. It was out of the scope of the pilot study

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Partly	MS mentioned that monitoring bottom trawl fisheries was carried out in 2018 on 33 on board and 72 landing sites. Monitoring longlines was carried out in 2019. Pilot study has been conducted throughout 2019 on 43 boarding sites. During 2020 monitoring gillnets was carried out on 37 boarding sites. However, no results on the bycatch of vulnerable specimens were reported.
Deviation from planned with justification	Yes	Partly	MS stated that there were no deviations in comparison to National work plan. However, it is difficult to evaluate that there are no deviations due to the fact that no planned activities were reported
Difficulties encountered	Yes	Yes	MS reported that the problem of cooperation with fishermen is present in all métiers. MS highlighted the need to educate fishermen about the purpose of recording incidental catches and additional motivation to ensure good and continuous cooperation for scientific monitoring.
Lessons learned	Yes	Yes	MS reported that training of scientific observers is needed to ensure appropriate handling and identification of vulnerable species and benthic organisms.
Inclusion into regular sampling or not with justification	Yes	Yes	MS reported that the incorporation of the results into regular sampling will be in accordance with the recommendations of relevant expert groups under RCGMed&BS, RCGLP and relevant RFMOs (GFCM and ICCAT).

Cyprus

Cyprus has carried out in 2019 a specific pilot study on incidental catch of vulnerable species with bottom trawlers.

The pilot study is comprehensive and MS has correctly followed the common agreed structure to report the requested information. There is a clear description of the investigated GSA with also some physical characteristics on the area and general notes on the vulnerable species. The use of standard and common methodology (i.e. FAO, 2019, “*Monitoring the incidental catch of vulnerable species in Mediterranean and Black Sea fisheries: Methodology for data collection. FAO Fisheries and Aquaculture Technical Paper No. 640*”) as mentioned by MS, represent also a good starting point for the continuation of this activity and for having common and standard results to compare at regional level. The activity has been completed through observer programmes, interviews and electronic logbooks. Interviews were made following the templates for questionnaires as described in the FAO/GFCM guidelines on incidental catch. However, MS considered questionnaires useful as complementary information on incidental catch, but not for collecting accurate information at species level, at least for elasmobranch species.

The percentage of trips for which information on incidental catches has been collected from observers accounts for 2.7%, which falls within the optimal coverage of 2-7% in accordance with the FAO/GFCM manual on incidental catches. Results do not suggest incidental catches of seabirds, marine mammals and sea turtles from trawlers. Based on the interviews, sharks are not common in catches, while rays are occasionally caught. Some issues (e.g. problems with vessel coverage in cases where a vessel becomes unavailable for sampling; difficulties in the identification of elasmobranch species etc.) were also highlighted in the report and MS consider that those problems should be further discussed at Regional level (i.e. RCG Med&BS).

Cyprus proposed to include the collection of incidental catches of vulnerable species into regular sampling, joined with the observer programme already in place for monitoring commercial catches and discards. The regular sampling programme on commercial catches can be adjusted for collecting data on the incidental catch of vulnerable species.

Member State:	Cyprus, report evaluation		
Topic of pilot study	Monitoring incidental catch of vulnerable species		
Reference year(s):	2019		
Duration of pilot study:	1 year		
Metier(s):	Trawler		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing?
Objective	Yes	Yes	The objective of the pilot study is clearly described in the report
Duration	Yes	Yes	MS asked to conduct the pilot study only in 2019
Description of area of application	Yes	Yes	There is a clear description of the investigated GSA with also some physical characteristics on the area and general notes on the vulnerable species
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	MS clearly reported both the total effort and the coverage
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	
Sampling protocol / observer manual	Yes	Yes	MS referred to the FAO (2019) protocol.
Inclusion of excluder or deterrent devices etc	There is no description of any mitigation device	NA	There is not any mention to the use of deterrent devices. It was out of the scope of the pilot study

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Main results are reported
Deviation from planned with justification	Yes	Yes	MS clearly explained the deviations from the planned activities. The planned trips to be sampled for incidental catch by observers were 8. However, due to changes in the trip durations, cancellations of fishing trips, and even unavailability of the observers, only 5 trips were sampled, covering all quarters open for trawling
Difficulties encountered	Yes	Yes	Having a very small fleet of trawlers operating in Cyprus waters, it was easily for the MS obtains a high sampling coverage of the fleet. The cons were that in cases where a vessel becomes unavailable for sampling, it could be difficult to replace it with another one that it was not already sampled. MS mentioned problem in the identification of elasmobranch species by the fishing crew and their distinguishment in vulnerable species.
Lessons learned	Yes	Yes	MS reported that it was very difficult to collect accurate data from the fishing crew through interviews, even with the use of identification guides. MS considered questionnaires useful as complementary information on incidental catch, but not for collecting accurate information at species level, at least for elasmobranch species.
Inclusion into regular sampling or not with justification	Yes	Yes	MS proposed to include the collection of incidental catches of vulnerable species into regular sampling, joined with the observer programme already in place for monitoring commercial catches and discards.

Denmark

Denmark presented information on two different studies which are explained below. Both refer to the level of fishing and impact of fisheries on biological resources and marine ecosystem. While the first one focus on incidental by-catch of all birds, mammals and reptiles (A); the second one refers to impacts of fisheries on marine habitats (B).

(A) incidental by-catch of sensitive species

Denmark started a project to collect by-catch data of air-breathing species using video-based electronic monitoring (EM) in 2010. The original project was not financed by the DCF program but was funded by the EMFF. In the beginning of the project, was only harbour porpoise captures monitored. By-catches of seabirds and seals were later added, since 2021 the project also includes elasmobranchs and chelonians. The project target gillnetters as these only to a smaller degree are covered in the standard observer program.

The pilot study report does not completely follow the requested format as some of the headings are missing. The only result present in the report is number of participating vessels by ICES area. It would benefit the understanding if the total number of vessels also were reported allowing the reader to get an understanding of coverage by the project. It is difficult to evaluate the success of the pilot study as both sections “Achievement of the original expected outcomes” and “Deviation from planned with justification” are missing in the report.

It is however evident from this report that Denmark has a long experience in monitoring by-catches of PETS with EM. It would thereby be interesting with more results on, for example, how large proportions of the videos that can be analyzed with good precision and main challenges for species identification and how these have been overcome.

Member State:	Denmark, report evaluation		
Topic of pilot study	Level of fishing and impact of fisheries on biological resources and marine ecosystem; A: incidental by-catch of all birds, mammals and reptiles		
Reference year(s):	WP 2017-2019		
Duration of pilot study:	2010-2021 (11 years)		
Metier(s):	gillnetters		
	Is section described in report? (Y/N/P)	Is the information sufficient to evaluate the pilot study? (Y/N/P)	What is missing? Comments
Objective	Yes	Yes	
Duration	Yes	Yes	
Description of area of application	Yes	Yes	

Material and methods			
Fishing effort and monitoring sampling effort. Effort coverage through observers on board and/or other methods	Yes	Partly	It would improve the report if information on total number of active vessels by area to contrast vessels equipped with cameras was present in table 1.
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	Opportunistic selection of vessels. Vessels that participate get additional quota.
Sampling protocol / observer manual	Yes	Yes	Methodologies and approaches used in the pilot study is broadly described.
Inclusion of excluder or deterrent devices etc	No	No	Information not present
Expected outcomes and results obtained			
Achievement of the original expected outcomes	No	Partly	Section not present, no results are presented, only number of participating vessels by fishing area
Deviation from planned with justification	No	Partly	Section not present, difficult to know what the planned activities where. Participation from vessels in all area is an objective and this is achieve in recent years
Difficulties encountered	No	Partly	Section not present, some difficulties are mentioned elsewhere in the report
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	A: The CCTV monitoring of mammals, birds and elasmobranchs is in 2021 included as a targeted sampling program within the Danish DCF monitoring.

(B) Impact of fisheries on marine habitats

Denmark is conducting a pilot study to improve the method for assessing the impact of fisheries on marine habitats using available data sources. To do this Denmark combines VMS data (which is more stable) with AIS data (which has higher resolution). This means that impact from fisheries on habitats can be analysed with a higher spatial resolution. Denmark has further developed an algorithm to, as far as possible, assign sales-slips from vessels not carrying logbooks to metier codes. The result have been that a larger part of the overall catches can be assigned to gear which in turn means that the impact on habitats can be assessed for a larger part of the fisheries. Finally Denmark has implemented a method, based on work in the ICES FBIT, for assessment on the impact on seabed habitat.

The pilot study report does not completely follow the requested format as some of the headings are missing. Results are presented as the development between 2009-2019 in percentage of landings that can be merged with position data (VMS/AIS/BlackBox) in relation total landings. The trend is positive and a larger proportion of the landings can be attached with position data. It is however difficult to evaluate the success of the pilot study as such as both sections “Achievement of the original expected outcomes” and “Deviation from planned with justification” are missing in the report.

Member State:	Denmark, report evaluation		
Topic of pilot study	Level of fishing and impact of fisheries on biological resources and marine ecosystem; B: Impact of fisheries on marine habitats		
Reference year(s):	WP 2017-2019		
Duration of pilot study:	2018-2022 (4 years)		
Metier(s):	Mobile bottom-contacting gears and small scale fleet without VMS		
	Is section described in report? (Y/N/P)	Is the information sufficient to evaluate the pilot study? (Y/N/P)	What is missing? Comments
Objective	Yes	Yes	The objective is to make high resolution mapping of fishing pressure and impact on seabed habitats for the Danish fishery with mobile bottom-contacting gears, and where possible also assessing the impact from small-scale fishery where VMS and logbook data are not available.
Duration	Yes	Yes	
Description of area of application	Yes	Yes	

Material and methods			
Fishing effort and monitoring sampling effort. Effort coverage through observers on board and/or other methods	Yes	Partly	Blackbox data need (and how this is used) to be better described.
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	The aim is to improve the ability to map fishing pressure for parts of the Danish fleet using existing data sources. This is described.
Sampling protocol / observer manual	Yes	Yes	Approach well described
Inclusion of excluder or deterrent devices etc	NA	NA	Not applicable
Expected outcomes and results obtained			
Achievement of the original expected outcomes	No	Partly	Section not present, increased coverage in fisheries that can be assessed as a consequence of method is reported
Deviation from planned with justification	No	Partly	Section not present,
Difficulties encountered	No	Partly	Section not present, some difficulties (and “problems” with data) are mentioned elsewhere in the report
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	The methods for combining the VMS, AIS, BlackBox data and using interpolation is now implemented in the DTU Aqua data flow

Finland

Finland has performed a pilot study to verify figures on by-catches of birds self-reported in logbooks and monthly coastal forms through an email survey. The report of the pilot study is thorough and follows the requested structure. There is no specific section on deviation from planned but methods used and results are presented in detail and there seems to have been no major deviations. The results indicates underreporting in logbooks and monthly coastal forms. The email survey was a quick and in comparison with observer schemes, cheap way to generate knowledge on by-catch of birds. The report could however have benefitted from a discussion on how reliable data from an email survey are and on how these can be verified.

Member State:	Finland, report evaluation		
Topic of pilot study	Level of fishing and impact of fisheries on biological resources and marine ecosystem. By-catch.		
Reference year(s):	2019 WP		
Duration of pilot study:	2019-2020 (survey of by-catches 2019)		
Metier(s):	NA		
	Is section described in report? (Y/N/P)	Is the information sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	Verify figures on bird by-catches from self-reporting through an email survey
Duration	Yes	Yes	
Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	Population targeted by the email survey is all fishermen with an email address registered in KAKE (central register of commercial fishery).
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	Selection of fishermen to contact well described
Sampling protocol / observer manual	Yes	Yes	Methodologies and approaches used in the pilot study is well described.
Inclusion of excluder or deterrent devices etc	Yes	Yes	No excluder or deterrent devices preventing bird bycatches were used in the fishing gear.

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Response rate well presented, results of email survey presented, comparison with figures in logbook presented
Deviation from planned with justification	Partly	Partly	No specific section on deviations from planned.
Difficulties encountered	Yes	Yes	
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	The overall outcomes. Inclusion of the survey in the regular collection of data (for example, every other year) is being considered. A decision on this matter will be made in connection with WP 2022–2024.

France

France presented information on three different studies which are explained below. All refer to the level of fishing and impact of fisheries on biological resources and marine ecosystem, but focus on different fisheries and areas. The first one focus on incidental by-catch of mammals in the Bay of Biscay (01); the second one refers to stomach sampling of rays in the Channel (02); and the third one analysed the post-release mortality of the oceanic white tip shark in the longliners and purse seiners operating in the Indian Ocean (03)

(01) Incidental by-catch of mammals in the Bay of Biscay

The objective of the pilot study was to achieve a better sampling effort (observer coverage) for the fleets which by spatial correlation analysis have been shown to have the highest correlation with the stranding of common dolphin in the Bay of Biscay (ICES divisions 8a-d).

The fleets were gillnetters and midwater twin trawlers. The incidental bycatch of common dolphin was thus observed on these fleets by increasing the observer effort in the national sampling program (ObsMer).

The study was carried out during two winter periods (the highest at-risk periods for bycatch):

2018-2019: 1st December 2018 – 30th April 2019

2019-2020: 1st December 2019 - 15th March 2020

Marking of bycaught individuals, which were then thrown back into the sea, were used together with the time and position of the incident, to validate the drift model for bycaught cetaceans, which was used to determine the most likely areas for bycatches.

The pilot study increased the coverage of the targeted fleets, however in the first period only 86% and 23% for the gillnetters and midwater twin trawlers respectively of the planned observer trips were carried out. For the second period this was 35% and 28%. MS explains the missing coverage, compared to what was planned, with the COVID-19 situation, problematic administrative rules for boarding the vessels, new gears taken into use by vessels already drawn from the sampling frame (here it could be useful with replacements) and bad weather conditions.

A total of 3 and 32 marine mammals were registered bycaught on a total of 182 and 60 trips for the gillnetters and midwater twin trawlers respectively. The sampling of incidental bycatch is already included in the ObsMer program, but according to MS, the coverage does not allow for a precise extrapolation/raising to bycatch per fleet.

Member State:	France, report evaluation		
Topic of pilot study	Incidental bycatch of PETS (common dolphin in Bay of Biscay)		
Reference year(s):	2018 - 2020		
Duration of pilot study:	3 years		
Metier(s):	PTM (midwater pair trawl), Gillnet		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	
Duration	Yes	Yes	
Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	
Sampling protocol / observer manual	Yes	No	Report has a web link to the ObsMer sampling protocol, which is used as basis for the pilot study protocol.
Inclusion of excluder or deterrent devices etc	Yes	Yes	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	The sampling effort was only 36% of the planned total trips
Deviation from planned with justification	Yes	Yes	
Difficulties encountered	Yes	Yes	
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	According to MS the coverage of the ObsMer program alone doesn't allow for a sufficient coverage to estimate bycatch per fleet

(02) stomach sampling of rays in the Channel

The main aim of the pilot study was to test a new survey aiming to collect data on diet composition and feeding ecology by a valorization of elasmobranch commercial landings and to use the results to propose a potential national on-shore stomach sampling program for elasmobranchs.

Two commercially important species of rays *Raja brachyuran* and *Raja montagui* for the French fishery in the western Channel and Bristol Channel (ICES divisions 7e and 7f) were used as a case study. A partnership with a wholesaler was arranged to get access to landings of the two species. In total there was 10 sampling occasions covering 13 fishing trips from both trawlers and gillnetters. The study made use of two methods to analyze the 186 collected samples. Diet composition was studied by analyzing stomach contents and feeding ecology by using ecological tracers (stable isotopes) to estimate the trophic position of the two species of rays.

The pilot study shows that it is possible to use on-shore sampling of elasmobranch stomachs by establishing a partnership with the wholesalers. The on-shore sampling of stomachs from the commercial fishery can be used to increase and supplement the data gained from at-sea surveys at a low cost.

Member State:	France, report evaluation		
Topic of pilot study	Stomach sampling		
Reference year(s):	2019 - 2020		
Duration of pilot study:	2 years		
Metier(s):	Trawl, gillnet		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	No	Yes	Test of a new on-shore survey aiming to collect data on diet composition and feeding ecology by a valorization of elasmobranch commercial landings.
Duration	No	Yes	No section but well described in the report
Description of area of application	No	Yes	No section but well described in the report

Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	
Sampling protocol / observer manual	Yes	Yes	Protocol carried out in the case study in the pilot study took into consideration the guidelines from FishPi2 work package 4 (2019) which proposed an at-sea research survey for stomach content collection.
Inclusion of excluder or deterrent devices etc	NA	NA	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	
Deviation from planned with justification	No	Yes	
Difficulties encountered	No	Partly	
Lessons learned	Partly	Yes	MS tested a new survey aiming to collect data on diet composition and feeding ecology by a valorization of elasmobranch commercial landings.
Inclusion into regular sampling or not with justification	No	Yes	MS states that before upgrading the survey to a national level, it is necessary to set the protocol: How many seasons should be considered per year? How many species should be collected per year and per region? These are some of the questions, strongly species dependent, that still need to be addressed in order to design properly the survey and estimate costs, prior to upgrading.

(03) post-release mortality of the oceanic white tip shark in the Indian Ocean

The aim of the pilot study was to quantify the post release mortality (PRM) of the oceanic white tip shark bycaught by the EU tuna and swordfish fisheries (pelagic longline and purse seine) in order to assess the retention-ban on the species.

Four EU fleets were engaged in the pilot study; 2 purse seine fleets (**France** and **Spain**) and two longline fleets (**France** and **Portugal**). The fishing area was the southwestern part of the Indian Ocean.

The methodology was based on tagging bycaught sharks with pop-up tags onboard vessels from the fleets covered. During the period April 2018 to November 2020, only 19 tags (of the 35 planned) were deployed, with 13 and 6 on sharks caught by purse seiners and by longliners respectively. Although 11 tags popped up prematurely, they had enough days at liberty to be included as valid results. Of the 19 bycaught, tagged and released sharks, only one suffered from PRM. Tag operations for the two French fisheries involved in the pilot study, purse seine and pelagic longline were not achieved in 2020 due to Covid health issues.

The preliminary results could be used as an argument for the efficiency of the retention ban as a conservation measure for oceanic whitetip shark in the Indian Ocean and at the same time it can be considered as an incentive for the fishers to apply best practice when releasing vulnerable bycaught species, to ensure the highest potential survival.

Member State:	France, report evaluation		
Topic of pilot study	Incidental bycatch of PETS – Post release mortality of Oceanic white tip shark		
Reference year(s):	2018 - 2020		
Duration of pilot study:	3 years		
Metier(s):	Purse seine and the pelagic longline		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	Study to quantify the post-release mortality (PRM) of individuals released by EU fleets
Duration	No	Partly	Not present as a section, but described elsewhere under Material and methods
Description of area of application	No	Partly	MS describes study area as southwestern part of the Indian ocean. No major fishing/management areas or sub-areas are presented.

Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	No	No	MS does not describe the number of fishing trips and trips with observers on-board.
Fleet selection and vessel selection with observers on board coverage	Yes	Partly	The selected fleets are described but the vessel selection is not.
Sampling protocol / observer manual	Yes	Yes	Tagging protocol is present in annex. The sampling protocol is missing.
Inclusion of excluder or deterrent devices etc	NA	NA	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	The MS describes only the overall number of different tags planned to be used for the bycatches for each fleet.
Deviation from planned with justification	No	Yes	No section for deviations, but described under Results and conclusion. Due to the COVID-19 situation, only 19 of the planned 35 tags were deployed.
Difficulties encountered	Partly	Partly	Impact on tagging effort for the French fleet, due to the COVID-19 situation.
Lessons learned	No	No	
Inclusion into regular sampling or not with justification	No	No	

Germany

Germany presented information on three different studies which are explained below. All refer to the level of fishing and impact of fisheries on biological resources and marine ecosystem, but focus on different fisheries and areas. The first one focus on mixed fisheries in the North Sea (2a); the second one refers to stomach sampling in Baltic and North Seas (2b); and the third one studied the fishing impact on marine habitats in the North Sea (2c). All projects contributed to several national research studies, as well to international working groups, notably related to ICES.

(2a) mixed fisheries in the North Sea

Germany is carrying out a project to improve availability of data and tools for estimating the level of fishing and the impact of fishing activities on marine biological resources and on marine ecosystems by investigating mixed fisheries models. Within the pilot are mixed fisheries model constructed, in collaboration with ICES WGMIXFISH, using the FLBEIA framework. The FLBEIA framework allows for including more options for describing stock dynamics (age-base, biomass-based, and fixed), as well as a more developed economic module than the framework presently used by ICES WGMIXFISH. The adoption of FLBEIA within the North Sea and other case studies involved in WGMIXFISH has resulted in a significant shift towards a more coordinated methodology in recent years.

It is difficult from the pilot study report to understand which part of this work that is the German pilot study and which part that are work of ICES WGMIXFISH. If a more specific objective of this pilot project was expressed in the pilot study report, this would be easier to understand. It is evident from the report that the work has been successful in terms of aligning the FLBEIA framework to ICES WGMIXFISH but it is unclear to what extent this is due to the pilot study.

Member State:	Germany, report evaluation		
Topic of pilot study	Mixed fisheries in the North Sea		
Reference year(s):	2017-2019		
Duration of pilot study:	2018-2021 (4 years)		
Metier(s):	NA		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Partly	“Improve availability of data and tools for estimating the level of fishing and the impact of fishing activities on marine biological resources and on marine ecosystems” is a very broad aim. A shorter and more precise objective will improve this section. Other “specific scientific goals” are mentioned later but are not clearly spelled out making difficult to

			understand their contribution to achieve the overall aim of the study.
Duration	Yes	Partly	Unclear. In the WP the planned duration of the pilot was 2017-2019. In the report 2018-2019 (with extension 2020-2021)
Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Partly	Methods need to be better described. The report would benefit from more information on <i>how</i> additional enhancements within the FLBEIA framework has been developed to meet the specific goals. That would also allow the reader to understand how the pilot study contributes to the overall work that is done in ICES WGMIXFISH.
Fleet selection and vessel selection with observers on board coverage	NA	NA	
Sampling protocol / observer manual	NA	NA	
Inclusion of excluder or deterrent devices etc	NA	NA	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	No	It is, since the specific goals for this project is not clearly spelled out, difficult to evaluate if achievements have been met. It would be interesting to know how stocks/species that are so limited in data can be incorporated in the framework. This will also give an indication on how well the MIXFISH approach works beyond TAC/data rich stocks to protect resources.
Deviation from planned with justification	Yes	Partly	Duration of the project is 2017-2019 in the WP and 2018-2019 in the report. This is not mentioned.
Difficulties encountered	Yes	Yes	
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	No	No	Not applicable

(2b) stomach sampling in Baltic and North Seas

Germany have conducted a pilot study on stomach sampling and diet analysis of selected fish species in the Baltic Sea and North Sea. In the Baltic sampling was carried out on a monthly basis for five species in different areas in the west and south. The sampling was stratified by depth. For some species the analysis of stomachs is still pending. In the North Sea, three species were sampled in the German Bight. One of the outcomes is the depth dependence in the diet composition for cod in the Baltic. This have implications for the design of future sampling programmes. It is however unclear from the report how this will be considered in the future. One of the conclusion from the pilot is that the sampling of fish stomachs on-board scientific surveys is feasible and cost-effective without complex planning. The outcomes of the pilot project in the North Sea are currently incorporated in the planning of a regionally coordinated stomach sampling programme being conducted by the EU Regional Coordination Group North Atlantic, North Sea & Eastern Arctic (RCG NANSEA).

The report is short and concise and follows the requested format. Methods and results are clearly described.

Member State:	Germany, report evaluation		
Topic of pilot study	Stomach sampling and analysis of selected fish species in the Baltic Sea and North Sea		
Reference year(s):	WP 2017-2019		
Duration of pilot study:	Baltic Sea 2015-2021 (7 years); North Sea 2018-2021 (4 years)		
Metier(s):	NA		
	Is section described in report? (Y/N/P)	Is the information sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	
Duration	Yes	Yes	In the WP the planned duration of the pilot was 2017-2019. In the report 2018-2019 (with extension 2020-2021)
Description of area of application	Yes	Yes	

Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	Sampling strategy described. Number of sampled and analyzed stomachs are expressed
Fleet selection and vessel selection with observers on board coverage	NA	NA	
Sampling protocol / observer manual	Yes	Yes	References to sampling manual (FishPi2), North Sea part and to a publication for the Baltic part
Inclusion of excluder or deterrent devices etc	NA	NA	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Achievements and initial conclusions are expressed
Deviation from planned with justification	Yes	Yes	No deviations from planned
Difficulties encountered	Yes	Yes	
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Partly	It is unclear if the depth stratified sampling in the Baltic will be incorporated in regular sampling scheme. In the North Sea are outcomes of the project incorporated into planning of a regionally coordinated sampling programme.

(2c) fishing impact on marine habitats in the North Sea

Germany is carrying out a project to improve availability of data and tools for estimating the level of fishing and the impact of fishing activities on marine biological resources and on marine ecosystems by investigating the fishing impacts on marine habitats. According to the report two aspects have been considered: i) bottom-contacting fishing gears potentially impact habitat quality and thus suitability and carrying capacity of marine ecosystems and ii) non-target species including rare and sensitive species are by-caught in the fishery potentially affecting ecosystem composition and functionality. Within the first part of the project (2018-2019) the objective was to determine fishing effort at highest possible geographical resolution and classify impact on different fishing gears to habitats. Germany writes that this has been done by adapting methods used by ICES and OSPAR. Germany is also currently updating workflows in the programming language R to generate data used in ICES and other data-calls, mainly to improve quality control and improve automated data-processing. The report would benefit from more information on how the methods have been adapted and updated. That would also allow the reader to understand how the pilot study contributes to the overall work that is done in for example ICES WGSFD. The report have all the headings requested. It is however difficult from the pilot study report to understand which part of this work that is the German pilot study and which part that are work of ICES WGSFD or other projects. The report would be improved by making this clearer.

Member State:	Germany, report evaluation		
Topic of pilot study	Fishing impacts on marine habitats in the North Sea		
Reference year(s):	2017-2019		
Duration of pilot study:	2018-2021		
Metier(s):	NA		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Partly	The aim of the project is very broad. The section in the report could be improved by a more precise objective. It would be easier for the reader to understand how this particular pilot study contributes to the achievement of the overall aim.
Duration	Yes	Partly	Unclear. In the WP the planned duration of the pilot was 2017-2019. In the report 2018-2019 (with extension 2020-2021)
Description of area of application	Yes	Yes	

Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Partly	Within the first part of the project (2018-2019) the objective is to determine fishing effort at highest possible geographical resolution and classify impact on different fishing gears to habitats. Germany writes that this has been done by adapting methods used by ICES and OSPAR. The report would benefit from more information on how the methods have been adapted. That would also allow the reader to understand how the pilot study contributes to the overall work that is done in ICES WGSFD.
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	Sylter Outer Reef and the Dogger Bank are chosen as case studies because most fisheries take place there.
Sampling protocol / observer manual	Yes	Partly	The report would benefit from methods and approaches being more explicitly described. In particular adaptations done on the work carried out by ICES WGSFD. Further scarce information on how the pilot study contributes to increased knowledge about sensitive by-catches.
Inclusion of excluder or deterrent devices etc	NA	NA	Question not applicable for this project
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Partly	The section in the report is a mixture of methods and results. It is also unclear what part of the work that is actually a part of the pilot study as the section contains a lot of references to other projects and work going on in Germany.
Deviation from planned with justification	Yes	Partly	Not clear what the reference to point 7c means. Duration of the project is 2017-2019 in the WP and 2018-2019 in the report. This is not mentioned.
Difficulties encountered	Yes	Partly	Experienced difficulties in the management of the project are mentioned but not difficulties related to the content of the project.
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	

Greece

Greece presented information on one single study to cover three different objectives: a. incidental by-catch of Protected, Endangered & Threatened species (PET), b. marine habitats; and c. marine biological resources and ecosystems. These are assessed here as two different studies, one related to stomach sampling and the second one unifying the monitoring of incidental catch of PETS and the impact on marine ecosystems.

Stomach sampling

Greece performed a pilot study on the analysis of stomach contents of hake (*Merluccius merluccius*) in the GSA 22-North Aegean Sea during 2018-2019 and extended that to 2020-2021.

Greece did not follow the common format to report the results/information, therefore it has been quite difficult to correctly evaluate the report, even if the information were present.

Greece refers to the methodologies described in the WKSTCON 2018 report (work shop on stomach content methodologies, RCG MED&BS) and in the EU MARE/2014/10 project. Hake stomach samples were collected from the GSA 22-North Aegean Sea, during the MEDITS (Mediterranean International Bottom Trawl Survey) trawl survey, during the summer of 2018 and 2019, and stomach contents were thereafter analyzed based on the agreed protocol. In 2018 and 2019, were collected 102 and 101 stomachs respectively.

Results, illustrating the diet composition (in weight W, %), are clearly presented for the different year. According to the analysis performed, the results indicate that Osteichthyes were the most important prey item (>80% W) followed by Decapoda (>15% W) and Cephalopoda (4% W). The importance of European anchovy *Engraulis encrasicolus* (23% W) in the diet of Mediterranean hake sampled in the GSA 22, for 2018-2019, should be noted. On the other hand, the most important decapod prey was *Parapenaeus longirostris*, constituting the 8% W in 2019. Greece highlighted that within the pilot study the following difficulties, among others, emerged:

- Sampling stratification by size proved very difficult to realize due to the lack of larger individuals collected during the MEDITS survey.
- A large number of everted stomachs found during sampling.
- The MEDITS approach is inadequate in providing information on seasonal variations in the feeding habits of this or any other species.
- In order to have a better understanding of the species feeding habits, information on other GSAs/seas should be included.

Greece considered that the pilot study has been proved as a valuable tool for its incorporation in the National Data Collection Program. Greece considers that stomach content analysis, in the context of an integrated ecosystem approach, it is a necessary tool and thus, this should be part of the sampling programs on monitoring carried out by the EU MSs.

Member State:	Greece, report evaluation		
Topic of pilot study	Stomach contents analysis		
Reference year(s):	2018-2019		
Duration of pilot study:	2 years		
Metier(s):	N/A		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Partly	Yes	MS didn't follow the common format to report the data/information. The description of the objectives are under the "Introduction" section
Duration	Partly	Yes	MS didn't follow the common format to report the data/information. The description of the duration is under the "Materials" section
Description of area of application	Partly	Partly	It is only mentioned that the area of application is GSA 22 (a map is also present). No information on the main characteristics of the areas are reported (e.g. ports, sea bottoms, vessels)
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Partly	Yes	This section is not present in the report. Data were collected during the implementation of the scientific surveys at sea Medits
Fleet selection and vessel selection with observers on board coverage	N/A	Yes	Hake stomach samples were collected from the GSA 22-North Aegean Sea, during the scientific survey at sea MEDITS (Mediterranean International Bottom Trawl Survey) trawl survey
Sampling protocol / observer manual	Yes	Yes	MS refers to the methodologies described in the WKSTCON 2018 report and in the EU MARE/2014/10 project
Inclusion of excluder or deterrent devices etc	N/A	N/A	Not applicable

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Results are clearly presented for the two years of activity.
Deviation from planned with justification	N/A	N/A	This section is not present, and no justification is provided for the deviations.
Difficulties encountered	Yes	Yes	MS reported that the sampling stratification by size proved to be very difficult to realize due to the lack of larger individuals collected during the MEDITS survey. Another problem mentioned by the MS is related to the large number of everted stomachs found during sampling, especially in large-sized individuals that are very rare during samplings, further enhancing the difficulty of sample size spanning in larger size classes.
Lessons learned	Yes	Yes	MS consider the MEDITS approach is inadequate in providing information on seasonal variations in the feeding habits of hake or any other species. The lack of larger individuals in the samples obtained is an issue that should be tackled (e.g. by including samples from other sampling sources). In order to have a better understanding of the species feeding habits, information on other GSAs/seas should be included.
Inclusion into regular sampling or not with justification	Yes	Yes	MS consider that stomach content analysis, in the context of an integrated ecosystem approach, it is a necessary tool and thus, this should be part of the sampling programs on monitoring carried out by the EU MSs.

Greece has conducted also a pilot study to monitor the impact of fisheries on Protected, Endangered & Threatened (PET) species and on marine habitats.

Greece monitored the incidental catch of vulnerable species with bottom trawlers in 2018, longlines in 2019, and gillnets in 2020. Greece did not follow the common format to report the results/information, therefore it has been quite difficult to correctly evaluate the report, even if the information were present.

The spatial coverage of the pilot study included three geographical subareas (GSAs): GSA 20 (Ionian Sea), GSA 22 (Aegean Sea) and GSA 23 (Cretan Sea). However, it is not present a clear description of the investigated GSAs, no information on the main characteristics of the areas are reported (e.g. ports, sea bottoms, fleet characteristics, etc.). MS reported the coverage (%) by GSA and for different métier.

Sampling protocols and data quality assurance framework were based on FAO/GFCM protocol (2019) as well as on WKPETSAMP report (ICES 2019).

Results are clearly presented for single gear and the different year. Regarding trawlers, both in GSA 20 and GSA 22, the vulnerable species with higher bycatch rates were *Alosa fallax*, *Squalus acanthias*, and *Mustelus mustelus*. A second group of species, including *Centrophorus granulosus* and *Oxynotus centrina*, exhibit moderate bycatch rates, mainly in Aegean Sea. Other important PET species recorded in the pilot study with low bycatch rates (rare bycatch events) were *Gymnura altavela* in GSA 20, *Mustelus punctulatus* in GSAs 20 and 22, *Hexanchus griseus* in GSA 22 and *Caretta caretta* in GSA 22. For the latter species, MS mentioned that since the recorded incidents were very low and therefore calculations had high uncertainty, total numbers should be treated with caution. It has also be noted that sea turtle species, such as *C. caretta*, are usually caught alive and always returned into the sea relatively unharmed.

In longliners (GSA 20), the PET species with higher bycatch rates were *Epinephelus marginatus*, *S. acanthias* and *C.granulosus* (*M. mustelus* and *Hippocampus hippocampus* were also recorded). In GSA 22 *M. mustelus*, *E. marginatus* and *G. altavela* were recorded and in GSA 23 only *E. marginatus* was recorded. The data collected during 2020 (with gillnets) are being processed. Concerning deviations from planned activities, this section is not present, and no justifications are provided for possible deviations. In general terms, Greece did not encounter serious problems during the monitoring programme, except from the issue on low sampling coverage on small scale fisheries. The number of vessels and the corresponding effort on these fisheries in Greece is quite high, so it is practically unfeasible for MS to reach the desirable threshold of 0.5% coverage with on board observers as requested from the guidelines.

MS proposed to include into the regular sampling activity, the bycatch monitoring on bottom trawls, longlines and gillnets-trammel nets, in GSAs 20, 22 and 23. The pilot study has revealed that monitoring could provide valuable information on the impact of fisheries on incidental catch of PET species.

Member State:	Greece, report evaluation		
Topic of pilot study	Monitoring incidental catch of vulnerable species and the impact of fisheries on marine ecosystems		
Reference year(s):	2018-2020		
Duration of pilot study:	3 years		
Metier(s):	Trawlers (2018), Longliners (2019), Gillnets (2020)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Partly	Yes	MS didn't follow the common format to report the data/information. The description of the objectives are under the "Introduction" section
Duration	Partly	Yes	MS didn't follow the common format to report the data/information. The description of the duration is under the "Materials" section
Description of area of application	Partly	Partly	It is mentioned only that the area of application are GSAs 20, 22 and 25 (a map is also present). No information on the main characteristics of the areas are reported (e.g. ports, sea bottoms, vessels)
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Partly	Yes	MS reported the coverage (%) by GSA and for different métier.
Fleet selection and vessel selection with observers on board coverage	No	No	No information is reported on the selection of fleet vessel
Sampling protocol / observer manual	Yes	Yes	MS mentioned that the FAO 2019 protocol has been followed
Inclusion of excluder or deterrent devices etc	There is no description of any mitigation device	NA	There is not any mention to the use of deterrent devices. It was out of the scope of the pilot study

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Results are clearly presented for single gear and the different year.
Deviation from planned with justification	No	Partly	This section is not present, and no justifications are provided for possible deviations. MS reported low coverage for small scale fisheries
Difficulties encountered	Yes	Yes	MS reported that the number of vessels and the corresponding effort on these fisheries in Greece is quite high, so it is practically unfeasible to reach the desirable threshold of 0.5% coverage with on board observers.
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	MS proposed to include into the regular sampling activity, the bycatch monitoring on bottom trawls, longlines and gillnets-trammel nets, in GSAs 20, 22 and 23. The pilot revealed that monitoring could provide valuable information on the impact of fisheries on incidental by catch of PET species.

Ireland

Ireland presented information on four different studies which are explained below. All refer to the level of fishing and impact of fisheries on biological resources and marine ecosystem, but focus on different fisheries and areas. The first one presents a methodology to map fishing pressure on habitats for vessels under 12 metres (a); another one assesses fisheries interactions of Irish offshore reef habitat using the ROV (remotely operated vehicle) Exploration of Reef (SeaRover) (b); a third one relates to species catch composition in fisheries posing a risk for biodiversity (c); and, finally, the last study relates the MYDAS project, establishing Maximum sustainable Yield proxies for data limited stocks for key stone species and sensitive species (d).

(a) mapping small scale fisheries pressure on habitats

Ireland is conducting a pilot study to trial the functioning of different available systems for inshore VMS on the small scale commercial fleet (SSCF). The topic of the pilot study is highly relevant as vessels smaller than 12 meters usually not carry VMS. This results in difficulties to determine location of fishing operations and hence fishing pressure on the same spatial scale as for fisheries with larger vessels. This implies that spatial fishing pressure is less known in areas, usually within the coastal zone, utilized by the SSCF fleet. It has implications for the understanding on how the SSCF interacts with other sectors utilizing the same area and also with habitats and species in e.g. Natura 2000 zones. The Irish pilot study is very thorough. Approximately 160 vessels (out of the about 1600 SSCF vessels in the Irish fleet) have participated in the study.

The pilot study tests VMS systems from several suppliers taking the special needs for the SSCF into account from an array of perspectives, including costs and the need for external power sources on small vessels. The study also includes aspects important for effort VMS based effort estimation for passive gears. Such aspects include test of different sensors that indicate when the gear is fishing (in contrast to the VMS that indicate when the vessel is active) and frequency of VMS pings needed to estimate effort at a sufficient spatial scale.

The pilot study also covers data flows from several suppliers can be integrated into one database. A conclusion is that a standardized format is needed to achieve this. Another conclusion is that intelligent data analysis is needed to examine the large volume of incoming VMS data from SSCF.

It seems from the report that the pilot study primarily focuses on the razor clam fishery but that other vessels could participate on a voluntary basis. It would be interesting to know how many of the participating vessels that were from other fisheries and thereby how the generic results on i.e. ping frequencies and sensors are the SSCF fleet as a whole. The report of the pilot study would also generally benefit from more details as the topic most likely is of interest for other Member States as well. The study is however ongoing.

Member State:	Ireland, report evaluation		
Topic of pilot study	Methodology to map fishing pressure of <12m vessels: Inshore VMS		
Reference year(s):	2017-2019		
Duration of pilot study:	2014-2021 (7 years)		
Metier(s):	Vessels fishing for razor clams (Ensis spp) in shallow (<15m) waters in the Irish Sea and vessels using traps and set nets in the Celtic Sea and west coast of Ireland.		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	
Duration	Yes	Yes	
Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	The objective of the PS is to trial the functioning of iVMS systems on a part of the SSCF fleet. Parts of the fleet that are involved in the project on a mandatory (dredges) and voluntary (pots and gillnets) basis are well described.
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	It would be interesting to know how large part of the fleet that could participate in the project on a voluntary basis that actually did that to better understand the overall acceptance of the iVMS. Report would benefit from inclusion of this information
Sampling protocol / observer manual	Yes	Yes	Methods and approaches to meet objectives are generally well described.
Inclusion of excluder or deterrent devices etc	NA	NA	Question not applicable for this project

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Achievements are well described.
Deviation from planned with justification	No	Yes	No section in the report regarding deviations from plan. However, achievements largely meet the objectives so no major deviation from planned seemed to have happened.
Difficulties encountered	Yes	Partly	It would be beneficial for the report if this section could be extended and also include how the difficulties were overcome. Eg. There is a statement on difficulties to coordinate gear sensors with VMS. It would be interesting to better understand those difficulties and how and to what extent they were solved.
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Partly	It is not completely clear how the results from the pilot study will be implemented in management (and data collection) of the Irish SSCF fleet. New control regulation might imply that location trackers will be mandatory for the entire European SSF fleet. Results and experiences from this project can support the implementation of such decision.

(b) assessing fisheries interactions of Irish offshore reef habitat using the ROV Exploration of Reef (SeaRover)

The primary aim of the present study was to map distribution and abundance of biogenic and geogenic reefs along Ireland's continental margin. The SeaRover Survey were conducted 2017-2019. 154 transects (depth range 540 - 2600 m) were investigated using a ROV (remotely operated vehicle) equipped with high-definition (HD) camera and a robotic arm for sample collection. Reefs and other sensitive habitats were identified from HD video footage and so where (putative) species. The footage was also analysed for frequency and type of marine litter (including lost fishing gear) and trawl marks.

The survey was conducted in accordance to plan and the report is very informative. The data from the survey *“will ensure the availability of comprehensive biological baseline datasets which will be critical to the formulation of future policy on the management, monitoring and conservation of Ireland's deep- water ecosystems.”*

What is missing in the report is however an analysis of fishing pressure in relation to the identified sensitive habitats. The interaction with fisheries is presently only indicated through presence of lost fishing gear and trawl marks. The analytical part of the pilot study is however still ongoing.

Member State:	Ireland, report evaluation		
Topic of pilot study	Assessment of fisheries/habitat interactions of Irish offshore reef habitats: Sensitive Ecosystem Assessment and ROV Exploration of Reef (SeaRover)		
Reference year(s):	WP 2017-2019		
Duration of pilot study:	2017-2021 (4 years), Data collection 2017-2019, Data analysis also 2020-2021		
Metier(s):	NA		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Partly	The primary aim expressed in the report is “to map the distribution and abundance of Ireland's biogenic and geogenic offshore reef habitat within Ireland's EEZ with a view to protecting them from deterioration due to fishing pressures.” In the WP 2017-2019 it is indicated that the findings should be mapped towards pressure from fisheries. This part of the analysis is missing from the report.

Duration	Yes	Yes	Duration of the project very well described
Description of area of application	Yes	Yes	Area of application very well described
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	Survey area (Ireland's continental slope), proportion of the survey area to be covered by the survey and are very well described.
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	Selection procedures for transects and films/samples taken within transects are very well described
Sampling protocol / observer manual	Yes	Yes	Methods to perform the survey and analysis of material from the survey are well described.
Inclusion of excluder or deterrent devices etc	NA	NA	Question not applicable for this project
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Achievements are well described.
Deviation from planned with justification	Yes	Yes	No deviations from planned.
Difficulties encountered	Yes	Yes	Important point on challenges with taxonomical knowledge for other groups than fish in deepwater environments.
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	Future sampling in the areas covered by the SeaRover project will depend on monitoring requirements in fulfilment of the Habitats directive and/or as part of monitoring programmes of potential future MPA designations and management measures.

(c) species catch composition in fisheries posing a risk for biodiversity

Ireland is carrying out pilot studies to increase the knowledge of interactions between fisheries and marine mammals, birds and other PETS species. An overall objective, besides collect data, is to learn about what monitoring programmes are most efficacious in obtaining such knowledge. The pilot study report covers three different studies; monitoring of by-catch of protected species, necropsies of stranded cetaceans and observations of sea-birds during surveys. The different studies are well separated in the report. Methods, preliminary results and lessons learned are generally sufficiently well described for the different parts. The pilot study on by-catches would benefit for more information on sampling coverage (percentage of fishing effort covered by sampling) to supplement the information on sampling effort. It is not clear to what extent the sampling is carried out within the “routine” sea-sampling programme and to what extent extra sampling have been carried out within the pilot. The study on necropsies of stranded cetaceans would benefit from inclusion of more results. It would, for example, be interesting to understand how many of the stranded cetaceans that have died after encounter with fishing gear.

By-catches of birds and mammals seems, based on the results of the pilot study, be rare events in Irish fisheries with the exemption of some high-risk fisheries. A conclusion in the report is thereby that it is extremely challenging to estimate bycatch rates solely through observer schemes. Risk assessments need to be done to direct observer effort.

As the sub-studies are presented within one common report, it would be interesting a comparison with the different approaches (eg. by-catch rate estimated from necropsies versus by-catch rate estimated from sea-sampling).

Member State:	Ireland		
Topic of pilot study	Fishing and impact of fisheries on biological resources and marine ecosystem; Species catch composition in fisheries posing a risk to biodiversity		
Reference year(s):	WP 2017-2019		
Duration of pilot study:	2017-2021 (5 years)		
Metier(s):	Demersal vessels: OTB_CRU, OTB_DEF, TBB_DEF, SSC_DEF and GNS_DEF; Pelagic vessels OTM and PTM (divided into SPF and LPF)_		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	The report covers 3 studies carried out to support the overall objective (monitoring of by-catch of protected species, necropsies of stranded cetaceans and observations of sea-birds during surveys)

Duration	Yes	Yes	Duration of the project is well described
Description of area of application	Yes	Yes	Area of application is well described
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Partly	Observer effort is well presented. The report would benefit from inclusion of fishing effort as well, allowing the reader to get an understanding of sampling coverage. It is further not possible from the report to understand how many of the reported trips that are part of the Irish “standard” sea-sampling programme and if “extra” trips have been carried out within the pilot.
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	Vessel selection procedures (by-catch study) are well described. Reason for selecting certain surveys for bird observations are described.
Sampling protocol / observer manual	Yes	Partly	Sampling manual for the by-catch study is attached and sufficient. The report would benefit from a better description/ inclusion of the observer manual for observations of birds/mammals on surveys
Inclusion of excluder or deterrent devices etc	Yes	Yes	The studies of by-catch did not cover use of excluders
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Achievements are well described.
Deviation from planned with justification	Yes	Yes	
Difficulties encountered	Yes	Yes	
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	Since its inception, the by-catch study has been fully integrated into the existing at-sea catch sampling programme.

(d) MYDAS project, establishing Maximum Sustainable Yield (MSY) proxies for Data-limited Stocks for key stone species and species sensitive to the impacts of fishing

The background for this is that many stocks caught in Irish (and other Member States) commercial fisheries are considered data limited for different reasons.

The report of the pilot study is short and concise. It is clear from the report what the expected outcomes are and that results will be published in peer-reviewed journals. The report has all requested headings included. More details can be found on the project website and within a project report (links to those included in the pilot study report). It is also clear that the work is carried out in conjunction with relevant ICES expert groups.

Member State:	Ireland, report evaluation		
Topic of pilot study	Establishing Maximum Sustainable Yield (MSY) proxies for Data-limited Stocks for key stone species and species sensitive to the impacts of fishing		
Reference year(s):	WP 2017-2019		
Duration of pilot study:	2017-2019 (3 years) with extension 2020-2021		
Metier(s):	NA		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	
Duration	Yes	Yes	Duration of the project is described
Description of area of application	Yes	Yes	Area of application is described. However within the project methods are developed that can be used elsewhere.
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	NA	NA	Project is about developing methods to assess data limited stocks with the focus to establish MSY reference points (or proxies). And to create a generic structure for those methods to enable for users. Methods are broadly described in the pilot study report. Details are found in the report (link in the pilot report). Results from the project are/will be published in peer review journals.

Fleet selection and vessel selection with observers on board coverage	NA	NA	Rationale for case studies chosen are described.
Sampling protocol / observer manual	NA	NA	
Inclusion of excluder or deterrent devices etc	NA	NA	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Partly	Achievements are described. The outputs of the projects needs to be evaluated by the scientific community (which also is an objective/taken care of in the project as outcomes will be published in peer review journals). The work is also recognized by different ICES EGs. The partly just indicate that the information in the pilot study report solely can be used to evaluate the success of the project.
Deviation from planned with justification	Yes	Yes	Output from project are made more generic than originally planned
Difficulties encountered	Yes	Yes	No major difficulties encountered
Lessons learned	Yes	Yes	
Inclusion into regular sampling or not with justification	Yes	Yes	Outcomes of the project can be used to identify gaps in data collection.

Italy

Italy presented information on three different studies which are explained below. All refer to the level of fishing and impact of fisheries on biological resources and marine ecosystem, but focus on different fisheries and areas. The first one focus on incidental bycatch of PET species in drifting longline fisheries (01); the second one refers to incidental by catch of vulnerable species (birds, mammals, reptiles and fish) in the otter bottom trawl fisheries during 2018 (02); and the third one studied predator-prey relations during 2018 and 2019 (03).

(01) incidental bycatch of PET species in drifting longline fisheries

The aim of the pilot study was to observe the incidental bycatch of PET species in drifting surface and midwater longline fisheries. Data on bycatches from observer trips and self-reporting logbooks were integrated to estimate the bycatch of PET species. The use of self-reporting as a method, allows for a ‘boost’ in the sampling effort i.e., a better coverage of the fleet.

A total of 20 vessels were covered by a total of 429 days of monitoring: 36 days by observers on-board and 393 days by self-reporting. The areas included in the study were the Mediterranean Sea geographical sub-areas (GSA) 9, 11, 16, 18 and 19.

The results show that most of the bycatches of vulnerable species were observed on midwater longliners.

The study did not deviate from what was planned according to the national WP and did not encounter any significant difficulties.

During the 2019 monitoring of drifting longlines, no incidental catches of mammals or seabirds were detected but several fishes (mainly elasmobranchs) and few turtles (4% catch frequency).

The study uses self-reporting and observers on board sampling, but no comparison in terms of numbers of bycaught vulnerable species is made between the two types of sampling. It would be interesting to see if there is a mismatch between the observer data and the self-reporting data.

Member State:	Italy, report evaluation		
Topic of pilot study	Incidental by-catch of PETs		
Reference year(s):	2019		
Duration of pilot study:	1 year		
Metier(s):	Longline		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / Comments
Objective	No	Partly	Not specified in the report, but likely to be the monitoring of bycatch of PETs in the Italian longline fishery.
Duration	Yes	Yes	

Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	Sampling focused on longlining vessels targeting swordfish and tuna.
Sampling protocol / observer manual	No	No	Not present in the report but the methodology is described in the report MARE / 2014 / 19 -SI2.705484: Spedicato, 2016.
Inclusion of excluder or deterrent devices etc	NA	NA	PS focusing on monitoring the by-catch, not to mitigate it.
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Partly	Partly	Data on bycatches from observer trips and self-reporting logbooks are integrated to estimate the bycatch of PET species. However, sampling design and sampling effort are not described in the report, making it difficult to assess if the expected output is achieved.
Deviation from planned with justification	Partly	Partly	Not possible to determine since the sampling design and effort is not described in the report, but no deviation from the MS WP
Difficulties encountered	Yes	Yes	No difficulties were encountered
Lessons learned	No	No	Not present in the report
Inclusion into regular sampling or not with justification	No	No	Not present in the report

(02) incidental by catch of birds, mammals, reptiles and fish in the otter bottom trawl fisheries

The pilot study aims to monitor the incidental bycatch of vulnerable species in the bottom trawl fisheries in all the Italian Geographical Sub-areas (GSA 9, 10, 11, 16, 17, 18 and 19) by a combination of three different methodologies:

1. Observers onboard
2. Self-reporting by the fishers.
3. Interviews at landing points

4536 fishing days were covered in total in 2018, split in 3343 self-sampling using log-books, 1000 interviews (only for OTB_DES) and 193 observations on board and at landing.

In the results the observers on-board and at landing points are pooled, which could bias the observer results, since no verification exists of the actual bycatch when doing on-shore/harbor sampling.

A comparison of the bycatch observed for the 3 different methodologies would be fruitful, to see if there is a mismatch between the observer onboard and the interviews/self-reporting data.

The results from the self-reporting can be used to increase the monitoring of bycatches though data originating from self-reporting, interviews and at landing points should be cross checked and validated with at-sea observations. The self-reporting/interviews do however give an idea of the magnitude of the minimum bycatch.

No by-catch of birds were reported so far, but one single bottlenose dolphin, released alive at sea. As in previous study, elasmobranchs appeared more frequently and reptiles the less often.

Member State:	Italy, report evaluation		
Topic of pilot study	Incidental bycatch of vulnerable species		
Reference year(s):	2018		
Duration of pilot study:	1 year		
Metier(s):	Otter bottom trawl (OTB)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / Comments
Objective	Partly	Partly	Not clearly described in the report. Unclear if the main objective is to get estimates of bycatch of vulnerable species by monitoring the otter bottom trawl fisheries or to test a methodology using data from self-sampling program (by the fishers) to support the data from the observer program.
Duration	Yes	Yes	

Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	Fleet observer program supported by self-reporting (logbooks) and interviews at landing point (access-point surveys).
Fleet selection and vessel selection with observers on board coverage	Yes	Partly	Fleet and vessel selection was based on existing fleet observer program combined with a representative sub-sample of vessels self-reporting their bycatches. The selection of fishing gears to be monitored was based on the outcomes of the EU Project MARE/2014/19 Med&BS.
Sampling protocol / observer manual	No	No	Not present in the report but described in EU Project MARE/2014/19 Med&BS.
Inclusion of excluder or deterrent devices etc	NA	NA	Not in the scope of the pilot study.
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Partly	Partly	There is not information on the planned sampling effort. The achieved sampling effort in number of days monitored is described in the report split by métier and methodology used (i.e. self-reporting, observers and interviews). Frequency of occurrence for the vulnerable species for all OTB métiers in each GSA
Deviation from planned with justification	No	No	
Difficulties encountered	Yes	Yes	Increased difficulties of performing observations on board commercial vessels during normal fishing activities due to administrative and bureaucratic issues. Low degree of cooperation from the fishers.
Lessons learned	Yes	Yes	The logbook methodology has a low cost, but requires a high degree of cooperation from the industry. In this sense, fishers often have too many forms to complete on a daily basis and their voluntary collaboration may suffer from the obligation of reporting different data.
Inclusion into regular sampling or not with justification	Partly	Partly	New handbooks and guidelines for the data collection and identification of PET species, for onboard observers and self-sampling will be prepared.

(03) predator-prey relations during 2018 and 2019

The main aim of the pilot study was to increase the understanding of the trophic chain and on the pool of resources sustaining the different phases of the life cycle of European hake *M. Merluccius* by means of the diet composition using stomach content analysis.

During 2018 and 2019 a total of 31466 specimens of European hake were analyzed in all the Italian Geographical Sub-areas (GSAs 9, 10, 11, 16, 17, 18 and 19) for the evaluation of stomach repletion and 3007 stomachs were analyzed for their content/diet composition.

International bottom trawl surveys in the Mediterranean (MEDITS) were used to collect data together with additional samples (in particular hakes of large size) originating from biological sampling of the commercial fisheries (trawling, longline and gillnet).

Results shows that the European hake exhibits ontogenetic differences in the diet, e.g., switching to become more piscivorous when reaching a certain size, and this is in line with other studies on this species diet composition.

Member State:	Italy, report evaluation		
Topic of pilot study	Stomach content - Predator-prey relations		
Reference year(s):	2018 - 2019		
Duration of pilot study:	2 years		
Metier(s):	Scientific trawl surveys, commercial trawl, longline and gillnet.		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / Comments
Objective	Yes	Yes	The main objective is to increase the understandings on the trophic chain and on the pool of resources sustaining the different phases of the life cycle of <i>M. merluccius</i> ; the outcomes will provide useful elements to evaluate some parameters of population dynamics (e.g., natural mortality) of the species.
Duration	Yes	Yes	
Description of area of application	Yes	Yes	

Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	No	Partly	Data collection (stomach sampling) planned and executed but no description of the actual sampling plan.
Fleet selection and vessel selection with observers on board coverage	NA	NA	MEDITS experimental surveys together with biological sampling from commercial fishing vessels used to collect stomach samples.
Sampling protocol / observer manual	Yes	Yes	Data analyses of the sampled stomachs is described but no sampling protocol of the actual data collection is presented in the report
Inclusion of excluder or deterrent devices etc	NA	NA	Not relevant for the pilot study
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	With respect to the number of stomachs sampled and analysed per length class per GSA.
Deviation from planned with justification	No	No	No description in the report of the actual data collection. The protocol for analyzing the stomach samples was described.
Difficulties encountered	No	No	Not described in the report
Lessons learned	Partly	Yes	
Inclusion into regular sampling or not with justification	No	Partly	MS recommends to continue the collection and analysis of the stomachs, increasing the stomach samples for all the size classes of hake (<i>M. merluccius</i>).

Lithuania

Lithuania have conducted a pilot study to summarize the knowledge on the interaction between the Lithuanian fisheries and the marine environment. The pilot study consist of three parts where most effort in the report is given to the analysis of the Lithuanian fisheries with particular focus on catches of fish species listed in table 1D. The study is comprehensive and gives a lot of input to future sampling programmes. The second part of the pilot study is a summary of a survey (TRIPOLIS) undertaken 2014-2016. This survey included evaluation a bottom trawling intensity in the Lithuanian Exclusive Economic Zone (LEEZ) and its effects on bottom macrofauna communities. Bottom trawling intensity was estimated using VMS data. Data on impact on the seabed was collected with multibeam echosounder and side-scan sonar in areas of intensive trawling and data on benthic macrofauna was sampled using Van Veen grab. The report of the pilot study would benefit from a more thorough description of both methods and results from this survey. The third part of the pilot study is a summary of the results from a questionnaire on by-catches of birds and mammals. Results are well presented but a description on how this survey was carried out is missing. It is evident from the results that data on by-catches are missing through the self-reporting in the official statistics.

The pilot study report does not completely follow the requested format as “achievements”, “difficulties” and “lessons learned” are presented together within a result section. This means that it is somewhat challenging to evaluate the success of the project. Each section ends nicely with a conclusion on implication of the results for future sampling programmes. It is however unclear to what extent Lithuania intend to implement those changes as there is no specific title “Inclusion into regular sampling or not with justification”. The report would benefit from making this clearer.

Member State:	Lithuania, report evaluation		
Topic of pilot study	Level of fishing and impact of fisheries on biological resources and marine ecosystem		
Reference year(s):	2017-2019 WP		
Duration of pilot study:	2019-2020 (2 years), data from 2010-2018		
Metier(s):	NA		
	Is section described in report? (Y/N/P)	Is the information sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	Estimation of the level of fishing of Lithuanian commercial fishing fleet in the Baltic Sea and the impact of fishing activities on marine biological resources and on marine ecosystems.
Duration	Yes	Yes	
Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling	Yes	Partly	The pilot study have three parts; a) analysis of fish species present in table

effort Effort coverage through observers on board and/or other methods			ID, in landings from different parts of the Lithuanian fleet using data registered in the Lithuanian fisheries information data system (data from 2010-2018); b) evaluation of bottom trawling intensity in the Lithuanian Exclusive Economic Zone and its effects on marine ecosystems (2014 – 2016); c) anonymous questionnaires to skippers on by-catch of birds (2015-2017) and mammals (2016-2018). The methodology, in particular for the questionnaire and the evaluation of the trawling intensity could be better described.
Fleet selection and vessel selection with observers on board coverage	NA	NA	
Sampling protocol / observer manual	NA	NA	
Inclusion of excluder or deterrent devices etc	NA	NA	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Partly	Yes	The report does not have a specific section on achievement of original expected outcome. The results from the analysis in the pilot study are however well presented.
Deviation from planned with justification	Partly	Partly	No specific section on deviations from planned.
Difficulties encountered	Partly	Partly	No specific section on difficulties encountered. Not much information on difficulties in the text
Lessons learned	Partly	Partly	No specific section on lessons learned. Each section with presentation of results does however end with a conclusion on how the outcomes should be considered in a revision of the sampling programme.
Inclusion into regular sampling or not with justification	Partly	Partly	The overall outcomes are clearly formulated as justifications for adaptations in the Lithuanian sampling scheme. There is however no specific header on this topic so it is unclear to what extent the findings actually will be included in a new WP.

Malta

Malta presented two different documents: one related to the incidental catches of protected species (a) and the other one related to impact of fisheries on marine habitats (b) and on the marine biological resources and on marine ecosystems (c).

The first document (a) explains that Malta has been collecting data on incidental catch of sensitive species since the start of the implementation of the Commission Implementing Decision (EU) 2016/1251, i.e. January 2017. Malta makes use of the observers on-board for the collection of biological data to also collect data on the incidental by-catch of birds, mammals, reptiles and fish. Malta's protocol follows the recommendations of the GFCM-FAO 2019 manual.

The second document (b and c) explains that RCM Med&BS 2016 noted that to date, no end-user indicated the need of such data. In the case of such requirements, the methodology as outlined by the MARE/2014/19 Project with regard to stomach content analysis can be followed. Malta will follow the RCG Med&BS 2019 Recommendation 6 by implementing the monitoring of fish stomach content following the protocols provided by the STREAM project by the established deadline of 2021.

Finally, as a member of the project STREAMLINE (Streamlining the establishment of regional work plans in the Mediterranean and Black Sea) consortium, Malta will actively work towards the drafting of Regional Work Plans in the Mediterranean and Black Sea with respect to the monitoring of vulnerable species incidental bycatch and the fish stomach contents data collection.

Member State:	Malta, report evaluation		
Topic of pilot study	Level of fishing and impact of fisheries on biological resources and marine ecosystem: Stomach contents analysis		
Reference year(s):	N/A		
Duration of pilot study:	N/A		
Metier(s):	N/A		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	No	The section is present in the report, but wrong objective is reported. MS mentioned the bycatch and not the collection stomachs contents.
Duration	Yes	No	The section is present in the report, but no information are reported
Description of area of application	Yes	No	The section is present in the report, but no information are reported

Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	No	The section is present in the report, but no information are reported
Fleet selection and vessel selection with observers on board coverage	Yes	No	The section is present in the report, but no information are reported
Sampling protocol / observer manual	Yes	Yes	MS reported that the methodology as outlined by the MARE/2014/19 Project with regard to stomach content analysis is followed.
Inclusion of excluder or deterrent devices etc	Yes	No	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	No	
Deviation from planned with justification	Yes	No	The section is present in the report, but no information are reported
Difficulties encountered	Yes	No	The section is present in the report, but no information are reported
Lessons learned	Yes	No	The section is present in the report, but no information are reported
Inclusion into regular sampling or not with justification	Yes	Yes	MS reported that Malta will actively works towards the drafting of RWPs in the Mediterranean and Black Sea with respect to fish stomach contents data collection.

Portugal

The pilot study aimed to identify communities (fishes, cephalopods and crustaceans) and assess how they changed in space and time from 1990-2016 (along the Portuguese coast, ICES 9a) to be able to define ecological areas suitable for monitoring and assessment. For that end, the study used groundfish surveys data conducted by IPMA (and former institutes) from 1990 to 2016 to identify the communities and to make an assessment of how they have changed in space and time over the years.

Latitude and depth were found to play a major role in communities' spatial differentiation, probably associated to temperature, and three ecological areas were defined (north, southwest and south). In the studied period, *Macroramphosus spp.* abundance showed a marked decrease in all areas whereas Sparids increased in abundance in the south. Despite these major changes and fluctuations in species abundance over time no major trends in communities were observed.

The pilot study shows, that when trying to describe and assess trends in communities long data times series are needed. For several Member States such data series already exists as a result of the DCF.

To ensure a good management of coastal areas and the conservation of biodiversity it is of importance to have a good knowledge on the communities, which this project contributes to by identifying communities, assess their structure and perceive their changes.

Portugal included as annex to the pilot study a paper published in Marine Environmental Research (reference at the end of this document).

Member State:	Portugal, report evaluation		
Topic of pilot study	Level of fishing and impact of fisheries on biological resources and marine ecosystem.		
Reference year(s):	2017 - 2019		
Duration of pilot study:	3 years		
Metier(s):	Groundfish survey (Bottom trawl)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	To identify communities and assess how they changed in space and time (from 1990 - 2016).
Duration	Yes	Yes	
Description of area of application	Yes	Yes	Portugese waters in ICES 9a

Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	Described in annex: Portuguese Autumn Groundfish Survey (PT-GFS) conducted from 1990 to 2016 under the EU Data Collection Framework (PNAB/DCF).
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	Scientific Groundfish survey
Sampling protocol / observer manual	Yes	Yes	ICES, 2017. Manual of the IBTS north eastern atlantic surveys. Series of ICES Survey Protocols SISP 15, 92. Analysing of results is presented in annex
Inclusion of excluder or deterrent devices etc	NA	NA	
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	MS identifies communities as planned and assessed how they changed from 1990 – 2016.. Fishing activity, environmental conditions (including climate change) and biotic factors are all drivers possibly responsible for changes in species abundance. No major trends found in communities. Described in detail in: https://doi.org/10.1016/j.marenvres.2020.105044
Deviation from planned with justification	No	No	Not described in the report
Difficulties encountered	No	No	Not described in the report
Lessons learned	No	No	Not described in the report
Inclusion into regular sampling or not with justification	Yes	Yes	Potential changes in the regular sampling cannot be evaluated or determined before completion of PSII 2. Phase (2020-2021).

Romania

Romania has conducted a pilot study to assess the bycatch (i.e. discards and vulnerable species) in rapa whelk (*Rapana venosa*) fisheries. Main objective of the study was to estimate the effect of *Rapana venosa* fishery (with beam trawlers) on the juvenile stages of bottom fish species, such as turbot (*Scophthalmus maximus*) and spiny dogfish (*Squalus acanthias*), and also on the bycatch (when present) of other species. The study covered the Black Sea (GSA 29) with a duration of three years, starting in 2017 and end in December 2019. From 2020 the observers have started to observe also vessels with drift and/or fixed nets, vessels with pelagic trawls and vessels with active and passive gears in the GSA 29 and reported also if any incidental catch occurred during the daily mission.

The pilot study is comprehensive, and MS has correctly followed the common agreed structure to report the requested information. Even if Romania reported maps of the different sampling stations, a dedicated section with a clear description of the area (e.g. ports, sea bottoms, fleet characteristics, etc.) it is not present.

Romania reported that the methodology and techniques that were used for the collection, verification, processing and analysis of data and for the assessment of fish stocks are those generally accepted for the Black Sea basin and in accordance with international methodology. The methodologies of data collection were coordinated at Black Sea level between Romania and Bulgaria and or based on the needs of the end users. There is no mention on common protocols or guidelines.

Results are clearly detailed with also maps reporting information on the distribution of the catch composition and detailed info (e.g. abundance, distribution, length size, ratio, etc.) on both main commercial species, discards, and few data on the incidental catch of vulnerable species (i.e. some sharks).

Regarding the vulnerable species, during 2020, the observers on board the pelagic trawl did not record any bycatch specimen from the group of marine mammals, seabirds or sea turtles. Further, in the official statistics, there were no reported information of bycatch of vulnerable specimens discharged into the sea. However, in this period of time, the presence of some species have been reported around the vessels using pelagic trawl: dolphins (common dolphin *Delphinus delphis ponticus*, marsuin *Phocoena phocoena*, and rough-toothed dolphin *Tursiops truncatus ponticus*) and birds Caspian gull *Larus canhinans*, Black-headed gull *Larus ridibundu*, and great cormorant *Phalacrocorax carbo*).

No deviations from the initial planning.

In subsequent years Romania will continue collecting data for the target species and bycatch of marine organisms by the main types of activities of their fleets, in particular turbot fishery with gillnets and Rapana fishery with beam trawls.

Member State:	Romania, report evaluation		
Topic of pilot study	Level of fishing and impact of fisheries on biological resources and marine ecosystem		
Reference year(s):	2017-2020		
Duration of pilot study:	4 years		
Metier(s):	Beam trawlers (3 years); pelagic trawl and fixed nets (1 year)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / comments
Objective	Yes	Yes	
Duration	Yes	Yes	
Description of area of application	Partly	Partly	A dedicated section with a clear description of the area (GSA 29) it is not present. However, MS reported maps of different sampling stations.
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	No	Yes	Section not included, but a general section with the methodology where the main methods used are described together with maps of the sampling stations. Coverage (204 fishing days and 1551 fishing hauls) is reported. MS should add info on the total effort
Fleet selection and vessel selection with observers on board coverage	No	Partly	Section not included but there is a general section on methodology where the vessels selected for the study are described.
Sampling protocol / observer manual	Yes	Partly	Methodology used is described, but common protocols or guidelines are not mentioned.
Inclusion of excluder or deterrent devices etc	No	NA	There is not any mention to the use of deterrent devices.

Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Results are clearly detailed with also maps reporting bycatch distribution and bycatch rate for the main species. MS has also detailed the info collected both on discards and on incidental catch of vulnerable species.
Deviation from planned with justification	Yes	Yes	MS reported that there were no deviations from the initial planning. However, MS should report the planned sampling activity at the beginning of the pilot study.
Difficulties encountered	Yes	Yes	MS reported that there were no difficulties
Lessons learned	No	No	This section is not present in the report
Inclusion into regular sampling or not with justification	Yes	Yes	MS mentioned that the assessment of the impact on the ecosystem and marine species will include monitoring of beam trawl and sampling of data and samples, and the study will have annual continuity.

Slovenia

Reading the report, it seems that Slovenia, more than a pilot study, has conducted an analysis of 16 years of regular data collection (from 2005 to 2020) to assess also the impact of main fisheries on the vulnerable or protected species, and to collect accurate information on these species in terms of quantities, gears, temporal and spatial areas. The study focus on incidental catch of vulnerable or protected species incidentally caught with set nets (gillnet GNS and trammel net GTR) in the period from 2005 to 2020. Reported data are quite comprehensive, even if Slovenia has not strictly followed the common agreed structure to report the requested information (e.g. information on the fleet selection is missing, as well as deviations from plans and lessons learned).

There is not mention to common protocol or methodology already used in other areas of the Mediterranean and Black Sea. However, MS reported that the activity has been completed through observer programmes, self-sampling, and logbooks. No interviews have been conducted with fishermen. Results are presented for the different methodologies.

From the analysis of logbook data reported, 53580 fishing trips were scrutinised in the period 2005-2020 (involving fishermen using GNS or GTR). During this period, a total of 105 species were reported in the landing data, six of these were vulnerable or protected species: *Homarus gammarus* European lobster, *Maja squinado* spinous spider crab, *Lamna nasus* porbeagle, *Alopias vulpinus* thintail thresher, *Carcharhinus plumbeus* sandbar shark and *Anguilla Anguilla* European eel.

Between 2006 and 2020, 73 fishing trips were sampled with on board observers and, among others, eight vulnerable or protected species were observed (for a total of 79 specimens). The most abundant protected species was *Maja squinado*, counting 58 individuals. Other species were found occasionally and always with few specimens. No results for the self-sampling methodology are reported. MS mentioned that the collection of data regarding the incidental catches of vulnerable species is included in regular sampling programme.

Member State:	Slovenia, report evaluation		
Topic of pilot study	Monitoring incidental catch of vulnerable species		
Reference year(s):	2005-2020		
Duration of pilot study:	16 years		
Metier(s):	Gillnet and Trammel net		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing?
Objective	Yes	Partly	Although the aim of the study is to assess the impact of main fisheries on the vulnerable species and to collect accurate information on them, it is not clear if the objective is an analysis of the data collected during last 16 years.

Duration	Yes	Partly	It is not clear if MS has conducted a pilot study during the last 16 years or has carried out a regular sampling programme for the observation of PET species. Or if the pilot study began after 2017 analysing data from previous years.
Description of area of application	Yes	Yes	There is a clear description of the investigated GSA with a map of the fishing area
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	No	Partly	MS did not follow the common format to report the data/information. Information on fishing effort (i.e. fishing trip), are under the section “logbook data analysis”. Information on the sampling plan is not reported.
Fleet selection and vessel selection with observers on board coverage	Partly	Partly	MS did not follow the common format. On-board coverage description is under the “Results” section. Information on the fleet/vessel selection is not present.
Sampling protocol / observer manual	No	No	This section it is not present. Reference to protocols or guidelines are missing. MS reported that the species for which information have been collected are the ones listed in Appendix E of the GFCM Data Collection Reference Framework (DCRF).
Inclusion of excluder or deterrent devices etc	NA	There is no description of any mitigation device	The use of deterrent devices was out of the scope of the study
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	Main results are reported and are presented for different methodologies and by year.
Deviation from planned with justification	No	No	This section is not present, and no justifications are provided for possible deviations.
Difficulties encountered	No	No	This section is not present and no difficulties are mentioned in the report (with the exceptions of problems related to the COVID for last years)
Lessons learned	No	No	This section is not present in the report
Inclusion into regular sampling or not with justification	Yes	Yes	MS mentioned that the collection of incidental catches of vulnerable species is included in regular sampling programme

Spain

In one single document Spain presented two different type of studies, one focus on the Atlantic small scale coastal fleet, notably in the Basque country, and the other one in the Mediterranean.

The main objective for the pilot study was to estimate the Basque Country's catch and effort in the small-scale fisheries (SSF) and to estimate the possible incidental bycatch of seabirds by this fleet (especially gillnets, trammel nets, and longlines).

A combination of questionnaires (self-reporting) and on-shore sampling was used to get the information on catches and effort from the SSF. Selected skippers were trained for collecting data on discards.

There was found to be a mismatch between the pilot study data (self-reporting and on-shore sampling) and the data coming from official transversal data (sales notes and logbooks), which could be explained by a combination of the official data being of a lower quality regarding the species identification and sale of fish via unofficial channels.

The discard is only assessed using questionnaires with a one-year recall period. This is known to introduce recall bias in the results and the self-reported data is not cross-checked. The discard in self-reporting surveys is known to be of a lower quality than observer data. However, the use of self-reporting data can boost the coverage of the fleet and give a minimum estimate of the discard.

The monitoring of the SSF fleets is both difficult and important. The fleets are difficult to cover due to their many trips and their diversity in terms of gear types and harbors and they are important in terms of their potential harvest of a substantial amount of a fish stock.

Member State:	Spain, report evaluation		
Topic of pilot study	Incidental bycatch of PETs - Impact of small-scale fisheries on non-commercial and protected, endangered and threatened species (PETS)		
Reference year(s):	2017 - 2019		
Duration of pilot study:	3 years		
Metier(s):	Longline (LLS), handline (LHM), gillnets (GXX)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / Comments
Objective	Yes	Yes	The main objective was to get Basque Country's catch and effort estimates in the SSF and to estimate the possible incidental bycatch of seabirds by this fleet (especially gillnets, trammel nets and longlines)
Duration	No	Partly	It is not evident from the report if the duration of the actual study on SSF catch estimates was from 2017 to 2019. In the text there is reference to

			2018 but in a table the sampling design (harbour*day matrix) is given for 2017.
Description of area of application	Yes	Partly	On-shore sampling in a number of Basques harbours. However, the actual fishing areas are not described besides 'Basques country'
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Yes	Yes	
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	
Sampling protocol / observer manual	Yes	Yes	
Inclusion of excluder or deterrent devices etc	Yes	Yes	There were not mitigation devices. Fishers has a negative impression about them and consider that mitigation devices do not bring any benefit.
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Yes	It is unclear if the planned number of trips was covered. However, the sampling effort was 372 out of 5092 performed fishing trips. The pilot study did present catch estimates for the SSF together with estimates on the accidental bycatch of seabirds in the SSF.
Deviation from planned with justification	No	No	Not present in report
Difficulties encountered	No	Partly	The characteristics of SSF makes data collection difficult. SSF has some exceptions in terms of reporting catch and effort data through the Control Regulation, that has an important impact in the quality of the data obtained from the official statistics.
Lessons learned	No	Yes	Scientific sampling of the SSF fleet is necessary to get good enough data for the management of the fishery.
Inclusion into regular sampling or not with justification	No	No	Not clear if the sampling of the SSF is already included in the regular DCF sampling program

The aim of the pilot studies in the Mediterranean Sea was to assess the impact of main fisheries (bottom trawlers in 2018, longliners in 2019 and set nets in 2020 which was postpone to 2021) on the vulnerable species (birds, mammals, reptiles and fish) and to collect accurate information on these species in terms of quantities, gears, temporal and spatial areas.

The study area covers the Spanish Mediterranean, being for the trawlers the geographical sub-areas (GSA) 01, 02, 05, 06, 07 while GSAs 01 and 02 were covered for the longline fisheries too. The longline fishery was supposed to be covered in GSA 06 but the vessels operating in this area were not available during the pilot study.

Two sources were used to collect the data: observer programmes using standard data collection procedures by experienced on-board fishery observers, and official logbook data.

For both fleets the bycatches primarily were composed of sharks and rays.

When comparing the results coming from the two different data sources e.g., bycatches from observer trips with logbooks, it gives an impression of unreported bycatch (in the logbooks). This highlights the importance of having the observer programmes to get more precise and accurate data.

Member State:	Spain, report evaluation		
Topic of pilot study	Incidental bycatch of birds, mammals, reptiles and fish in the Spanish Mediterranean		
Reference year(s):	2018 (trawl) – 2019 (longline) – 2020 (gillnets)		
Duration of pilot study:	2 years (2020 study on gillnets postponed)		
Metier(s):	Bottom trawl, Longline (LLS)		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / Comments
Objective	Yes	Yes	Aim was to assess the impact of main fisheries on the vulnerable species and to collect accurate information on these species in terms of quantities, gears, temporal and spatial areas.
Duration	Yes	Yes	
Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling	Yes	Yes	

effort Effort coverage through observers on board and/or other methods			
Fleet selection and vessel selection with observers on board coverage	Yes	Partly	The proposed métiers are in agreement with the GFCM planned incidental catch sampling program which would be performed in the period 2018 - 2020
Sampling protocol / observer manual	No	Partly	MS describes sampling protocol as 'In the observer programmes the incidental bycatches have been recorded according to standard data collection procedures' Data on bycatch of species listed in annexes Data Collection Framework Handbook (GFCM 2018)
Inclusion of excluder or deterrent devices etc	No	No	Not mentioned in the report
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Yes	Partly	The results are presented without raising or comparing bycatches gained from the two data sources. E.g. comparing the bycatches of the species <i>Centrophorus granulosus</i> in GSA 6 from observer trips with logbooks gives an impression of unreported bycatch in the logbooks. Logbooks: 74817 trips = 92.1kg reported Observer: 211 trips = 34kg
Deviation from planned with justification	No	No	Not present in report
Difficulties encountered	No	No	Not present in report
Lessons learned	No	No	Not present in report
Inclusion into regular sampling or not with justification	No	No	Not present in report

Sweden

The overall aim of the pilot study was to investigate the suitability of incorporating passive gear fisheries in the regular national sampling program. The pilot study's objectives were to test observer sampling and coverage of small vessels, to test a multi-scheme setup, (observing both bycatch of fish and harbor porpoises on the same trip), and if this could be done in a way to allow for a good enough coverage of the fleet and at the same time being cost-effective.

The data on bycatches was collected using observers onboard longline and gillnet vessels. The areas covered were the Baltic Sea (ICES SD 23, 24, 25, 27 and 28) and Kattegat (ICES SD21).

Observers cannot do the regular sampling program and at the same time observe in an effective way for bycatches of harbor porpoises, as usually they fall down into the water before coming on board. During the pilot study there were two observers in each trip. The results showed little bycatches in some areas, which implies that to get precise quantitative estimates of by-catch a large number of trips must be covered. Observer programs are relatively costly and would need to be complemented by other more cost-effective ways to collect data to increase sample coverage.

MS plan to test the use of camera systems on small vessels as a replacement and/or complement to observers onboard. Despite the limited sampling effort, bycatches of harbor porpoises in the gillnet fishery in ICES SD21 were observed with a high frequency, making the MS include these fisheries in the regular sampling program.

Member State:	Sweden, report evaluation		
Topic of pilot study	Incidental bycatch Bycatches of birds and mammals in passive gear		
Reference year(s):	2017 - 2019		
Duration pilot study	3 years		
Metier(s):	Gillnet, longline		
	Is section described in report? (Y/N/P)	Is the information in the section sufficient to evaluate the pilot study? (Y/N/P)	What is missing? / Comments
Objective	Yes	Yes	a) if it is possible to put observers on sufficient number of (small) vessels to generate accurate data; b) occurrence and patchiness of by-catch. Effectiveness of observer schemes as methodology to collect data and, if so, how to design the schemes and sampling intensity needed; c) efficiency and possibilities of having multi-purpose observer schemes (e.g., fish and by-catches); d) cost-effective way to obtain data on by-catches of birds and harbour porpoises.

Duration	Yes	Yes	Not present as a section but present in Description of the study area
Description of area of application	Yes	Yes	
Material and methods			
Fishing effort and monitoring sampling effort Effort coverage through observers on board and/or other methods	Partly	No	Longliners and gillnetters pooled. Total coverage of the combined fleet is presented for the different ICES SD's.
Fleet selection and vessel selection with observers on board coverage	Yes	Yes	
Sampling protocol / observer manual	Partly	No	Sampling protocol for by-catches of sea-birds is present, but not for mammals.
Inclusion of excluder or deterrent devices etc	Yes	Yes	The use of deterrent devices is not a focus point in the PS but presence or absence of pingers on the sampled gillnets was noted by observers.
Expected outcomes and results obtained			
Achievement of the original expected outcomes	Partly	Partly	The number of planned sampling events and sampling intensity (PSU=week) is not described in the study. One of the aims of the study was to investigate the possibility of putting observers on sufficient number of (small) vessels to generate accurate data. No success criteria are present regarding the accuracy of the data. No result on the cost-effective way to obtain data on by-catches of birds and harbour porpoises. It is however mentioned that observers on-board sampling needs to be complemented by other sampling or observation method.
Deviation from planned with justification	No	No	Sampling plan not described
Difficulties encountered	No	No	Not described
Lessons learned	Yes	Yes	Observers can be used on small vessels to monitor by-catches. However, observer schemes are expensive and it could be difficult get enough coverage to achieve reliable estimates of by-catches.
Inclusion into regular sampling or not with justification	Yes	Yes	Gillnet fisheries in ICES SD21 and SD23 included in the regular sampling program since 2020, due to relatively high frequency of harbor porpoise bycatches during the pilot study

Published papers or documents related to the pilot studies

Bulgaria

Petrova E., Tserkova F., Mihneva V., Stoykov S., Valchev S., Penchev F. 2020. Fish Bycatch Rate by *Rapana venosa* (Valenciennes, 1846) Fishery in the Bulgarian Black Sea Waters, with a Special Emphasis on the Bycatch of Turbot *Scophthalmus maximus* (L., 1758) August 2020, *Acta Zoologica Bulgarica* Supplement 15(August 2020):165-172; http://www.acta-zoologica-bulgarica.eu/Suppl_15_30.pdf

Petrova E., Mihneva V., Tserkova F., Valchev S., Hyusein A. 2019, Bycatch by pelagic trawling off the western coasts of the Black Sea; 14th MEDCOAST Congress on Coastal and Marine Sciences, Engineering, Management and Conservation, MEDCOAST 2019, Volume 1, 203-214; https://www.researchgate.net/publication/336892622_Bycatch_by_pelagic_trawling_off_the_western_coasts_of_the_Black_Sea

Cyprus

[http://www.moa.gov.cy/moa/dfmr/dfmr.nsf/All/67011A7774B00003422581CA0023C467/\\$file/2017%20Cyprus%20surveys.pdf](http://www.moa.gov.cy/moa/dfmr/dfmr.nsf/All/67011A7774B00003422581CA0023C467/$file/2017%20Cyprus%20surveys.pdf)

Denmark

Beest, F.M., Kindt-Larsen, L., Bastardie, F., Bartolino, V., Nabe-Nielsen, J., 2017. Predicting the population-level impact of mitigating harbor porpoise bycatch with pingers and time-area fishing closures. *Ecosphere* 8. <https://doi.org/10.1002/ecs2.1785>

Glemarec, G., Kindt-Larsen, L., Lundgaard, L.S., Larsen, F., 2020. Assessing seabird bycatch in gillnet fisheries using electronic monitoring. *Biological Conservation* 243, 108461. <https://doi.org/10.1016/j.biocon.2020.108461>

France

ObsMer program 2018 report is available here: <https://archimer.ifremer.fr/doc/00619/73122/72281.pdf>

ObsMer manual is available online: <https://w3.ifremer.fr/archimer/doc/00664/77630/79680.pdf>

Peltier H., Authier M., Deaville R., Dabin W., Jepson P.D., van Canneyt O., Daniel P. & Ridoux V. (2016) Small Cetacean Bycatch as Estimated from Stranding Schemes: the Common Dolphin Case in the Northeast Atlantic. *Environmental Science and Policy*, 63, 7-18. <https://doi.org/10.1016/j.envsci.2016.05.004>

Brown-Vuillemin, S., Barreau, T., Caraguel, J.-M., and Iglésias, S.P. (2020). Trophic ecology and ontogenetic diet shift of the blue skate (*Dipturus cf. flossada*). *Journal of Fish Biology*, <https://doi.org/10.1111/jfb.14407>

Germany

Funk S, Frelat R, Möllmann C, Temming A, Krumme U (2020) The forgotten feeding ground: patterns in seasonal and depth-specific food intake of adult cod *Gadus morhua* in the western Baltic Sea. *J Fish Biol*: 1-16, [DOI:10.1111/jfb.14615](https://doi.org/10.1111/jfb.14615)

Greece

GREECE-Sampling scheme and Data Quality Assurance Framework. National Data Collection Programme 2019. 13 pp. Available at: [Sampling scheme & Data Quality Assurance Framework 2019.pdf](#)

Ireland

Sensitive Ecosystem Assessment and ROV Exploration of Reef (SeaRover), Synthesis Report. [Sensitive Ecosystem Assessment and ROV Exploration of Reef \(SeaRover\), Synthesis Report \(marine.ie\)](#)

MsY proxies for Data-limited Stocks (MYDAS) for key stone species and species sensitive to the impacts of fishing Phase 2. <https://emff.marine.ie/marine-biodiversity/msy-proxies-data-limited-stocks-mydas-key-stone-species-and-species-sensitive#outputs>

Project website: <https://github.com/laurieKell/mydas/wiki>

Italy

Sala A., Bonanomi S., Benetti A., Cani M. V., Ciofi C., Colombelli A., et al. (2018). Valutazione delle catture accidentali di specie protette nel traino pelagico BYCATCH 2016-2017. Relazione finale del progetto, 109 pp [\(PDF\) Valutazione delle catture accidentali di specie protette nel traino pelagico BYCATCH 2016-2017 \(researchgate.net\)](#)

Portugal

Teresa Moura, Corina Chaves, Ivone Figueiredo, Hugo Mendes, Ana Moreno, Cristina Silva, Rita P. Vasconcelos, Manuela Azevedo. 2020. Assessing spatio-temporal changes in marine communities along the Portuguese continental shelf and upper slope based on 25 years of bottom trawl surveys. <https://doi.org/10.1016/j.marenvres.2020.105044>