A PILOT STUDY TO START EVALUATING THE NEW "TRAPLINE/LOOP" GEAR IN THE EU.PORTUGAL PELAGIC LONGLINE FLEET OPERATING IN THE INDIAN OCEAN

Rui Coelho[1,2,*], Edgar Afonso[3], Cristina Rosa[3], Isabel Teixeira[3], Isabel Ventura[3]

SUMMARY

Recently, a gear modification known as "traplines" or "loops" has been introduced in pelagic longline fisheries targeting swordfish. It is unclear when this practice started, and what is the extension of its use, including in the Indian Ocean. The aim of this paper is to present a pilot study for the EU.PRT fleet that aims to collect data from this gear modification in the Indian Ocean, including collecting data on the "traplines/loops" configuration, and on species composition, catchability and size distribution in "traplines/loops" compared to hooks. Data on interactions with vulnerable species will also be collected and compared. The preliminary results will be presented to IOTC during 2026.

KEYWORDS: By-catch mitigation measures; Fishery indictors; Fishing gears, Selectivity.

[1]: Instituto Português do Mar e da Atmosfera (IPMA). Av. 5 de Outubro s/n, 8700-305 Olhão, Portugal
[2]: Centro de Ciências do Mar do Algarve (CCMAR/CIMAR-LA). Campus de Gambelas, Univ. Algarve, 8005-139 Faro, Portugal.
[3]: Direção Geral de Recursos Naturais, Segurança e Serviços Marítimos (DGRM). Av. Brasília, Lisboa, Portugal.
*: Corresponding author: Rui C

Introduction

Recently, a gear modification known as “traplines” or “loop” has been introduced in pelagic longline fisheries targeting swordfish. It is unclear when this practice started, and what is the extension of its use, including in the Indian Ocean.

There are records of the use of a similar gear in the Pacific Ocean for targeting other species (Ochi et al., 2025a), and more recently it started to be recorded and described for the Atlantic Ocean and Mediterranean Sea on surface longline fisheries targeting swordfish (Garibaldi et al., 2024; Coelho et al. 2025, Macías et al., 2025).

Some preliminary documents from the Mediterranean pointed to a much higher catchability of swordfish (Garibaldi et al., 2024), which has implications when producing indicators (e.g., standardized CPUEs) for use in stock assessments. In addition, the preliminary notes presented also mentioned very few catches of other species (Macías et al., 2025, Coelho et al., 2025), which has implications as a potential mitigation measure, especially with regards to interactions with vulnerable fauna (e.g., sea-turtles, seabirds, marine-mammals and some shark species).

In 2025, the IOTC WPEB (*Working Party on Ecosystems and Bycatch*) took note of this new loop gear known as “meka-ring/trap-line” (Ochi et al., 2025b), and made the following RECOMMENDATION:

- *The group RECOMMENDED that the SC takes note and REQUESTED CPC scientists to investigate within their fleets if such gear is in use in the Indian Ocean, and consider, taking into account the ongoing work at ICCAT, starting to include this type of gear in data collection methods in their logbook and/or observer program to collect the corresponding catch and effort data in the future. It is noted from some very preliminary literature that with this new loop gear the catch rates of swordfish are higher, and bycatch of sharks and turtles is much lower. As such, this new gear can also be further studied as a potential mitigation new measure for vulnerable species*

As such, it is currently of high priority to address the issue of this new gear, and there is a clear need to collect data and presenting results to the relevant IOTC working parties and SC.

For that purpose, the Portuguese Fisheries Administration (DGRM) together with the Portuguese Institute for the Sea and Atmosphere (IPMA) plans to start a pilot project in 2026 to collect quantitative data from this gear, that could provide the first preliminary results. The purpose of this paper is to present the pilot study for the consideration of the IOTC WPDCS.

Objectives of the pilot study

Given the need to start studying and evaluating this new gear, its implications and potential, the objectives of this pilot study are the following:

1) Collect data on the specific configuration that is used for the “traplines/loops” in the PRT LL fleet operating in IOTC.
2) Collect and analyze data on captures and catchability of the main target species (swordfish) in “traplines/loops” compared to the hooks regularly used by the fleet.
3) Collect and analyze data on the size distribution (i.e., size selectivity) of the main target species (i.e., swordfish and blue shark) in “traplines/loops” compared to the hooks used by the fleet.
4) Collect and analyze data on the bycatch of other species on “traplines/loops” compared to hooks, including interactions with vulnerable species.

Project dates

The data collection phase of the project is scheduled to start immediately and will take place during 2026. With regards to the project dates, we note that there might be interest in continuing this project for a phase 2 after 2026, possibly planning for at-sea experimental trials.

Specific details of the study

Areas covered

The main areas to be covered are the Indian Ocean areas where the EU.PRT LL fleet operates, which is mainly the SW Indian Ocean.

Effort covered

The EU.PRT fleet targets mainly swordfish and blue shark, and captures other species as occasional by-catch, such as marlins, tunas, other bony fishes and other sharks. The fleet also interacts occasionally with some vulnerable species, including sea-turtles, seabirds and marine-mammals. The intent is to collect data from as many vessels as possible, noting that the current fleet from EU.PRT operating in the Indian Ocean is limited to very few vessels.

For that purpose, all the vessels that intent to use the traplines/loops will register with the Portuguese Fisheries Administration (DGRM), and all data from the sets where traps are used will be reported to IPMA and DGRM.

Data collection strategy

The project includes two types of data collection strategies:

1) detailed logbooks developed specifically for this project and allowing the collection of data on effort, catches and size distribution on the loops and hooks;
2) data collected by onboard observers allowing more detailed and independent collection of similar data. The data collected by onboard observers has a few additional items, such as individual hooking/entanglement location, and data on at-haulback status (dead/alive upon capture).

Technical specificities

The EU.PRT LL fleet deploys almost exclusively shallow longline sets targeting swordfish and blue shark that operate at night. When using traplines/loops, the fishing strategy seems to remain mostly the same, with the same main line length deployed, and the main difference being that some of the hooks are substituted by the traplines/loops. There is not a full replacement of hooks by traplines/loops, but rather a substitution of some hooks with traplines/loops, and therefore both are used in the same set. This implies that less hooks are deployed compared to the regular operations in each set.

The technical details of the traplines/loops to be used is not yet fully know, as this is a new gear/strategy and there is still no data on that. One aspect of this pilot project is precisely to collect specific data on the specifications of the traplines/loops (i.e., number of loops used, length/diameter of the loops; if bait is used and what type).

Data to be collected

The data to be collected during this project includes the following 2 types described below.

- Data collected on detailed logbook: Set-by-set data on: date; initial and end position of the longline; number of traplines/loops, number of hooks, trace material on hooks, number of specimens (by species) captured in traplines/loops; number of specimens (by species) captured in hooks; discards (by species) captured in traplines/loops; discards of specimens (by species) captured in hooks; individual sizes of specimens (by species) captured in traplines/loops; individual sizes of specimens (by species) captured in hooks.
- Data collected by observers: Set-by-set data on: date; initial and end position of the longline; start and end of deployment time (used to calculate soaking time); start and end of hauling time (used to calculate soaking time); length of the mainline; number of traplines/loops; number of hooks; trace material on hooks; number of main buoys, gangions between floats (used as a proxy for gear configuration and depth); bait; number of specimens (by species) captured in

traplines/loops; number of specimens (by species) captured in hooks; individual sizes of specimens (by species) captured in traplines/loops; individual sizes of specimens (by species) captured in hooks; status (dead/alive) at-haulback; fate; hooking/entanglement location; sex (if possible); discards (by species) captured in traplines/loops; discards of specimens (by species) captured in hooks; detailed description of the traplines/loops (number of loops used, length/diameter of each loop, bait used).

It is noted that the data collected by the logbooks is already sufficient to perform many of the analysis envisioned, but that the more detailed observer data allows to both complement and validate the logbooks data, as an independent and more detailed source of data.

In terms of coverage, for the observer data we aim to cover the 5% minimum effort established by IOTC, noting however, that it is possible to cover vessels that are not using the new traplines/loops. On the other hand, the coverage of the data with logbooks aims to collect data from the sets when the fleet uses the new traplines/loops.

Data analysis

Various analyses are envisioned to be carried out with the collected data:

- Qualitative and quantitative description of the traplines/loops used.
- Species composition of the captures in traplines/loops vs hooks.
- Comparison of captures/CPUEs on traplines/loops for the main species (e.g., swordfish, blue shark), main bycatch (e.g., tunas, marlins) and vulnerable species (e.g., marine-turtles, sea-birds, marine-mammals).
- Size distribution of the main species (swordfish, blue shark) on traplines/loops vs hooks.

This pilot project will represent the first data collection and preliminary analysis for this gear in this fleet, and one of the first quantitative analysis for the Indian Ocean.

After this first year, with the preliminary results analysis, presented and discussed, it will be possible to discuss the next steps, including strategies and effort needed (by means of power-analysis) to carry out independent experimental trials at-sea for this new gear.

Control measures put in place

The vessels to be involved in the study are registered with the Portuguese Fisheries Administration (DGRM) and have licenses to operate under the respective RFMOs, including IOTC. The vessels need to comply with all IOTCT, EU and PRT measures put in place, such as no-retention measures for several species, TACs and quotas, any spatial/seasonal restrictions, minimum retention sizes, etc.

Presentation of the results

The IPMA scientist involved in this study has ample experience preparing and presenting papers to the IOTC, and other RFMOs scientific bodies. The following scientific outputs are envisioned during 2026:

- Presentation at the WPEB (Working Party on Ecosystems and Bycatch): This will one of the main 2026 presentations, that will be delivered to the WPEB with the first preliminary results from this study.
- Presentation at the WPDCS (Working Party on Data Collection and Statistics): If relevant, the results will also be presented in 2026 to the WPDCS.

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