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Novel identification approach for quantifying and characterizing Abandoned, Lost, or otherwise Discarded Fishing Gear (ALDFG)

PLASFITO RESEARCH PROJECT

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INTRODUCTION

Annual plastic pollution from abandoned fishing gear (FG) ranges from 28.4 kt to 100 kt , constituting 2.3% to 4.7% of global FG production [1]. To identify FG sources and complement existing marine litter classifications, we developed an easy-to-use identification-key (ID-K) (Fig. 2) that we applied on marine litter sampled in the southeastern Bay of Biscay (BoB) shores (Fig. 1).

M&M

1. What? Sampling of beached marine litter
   When? Seasonal sampling from Nov. 2022 to Nov. 2023
   Where? 8 beaches of the southeastern BoB (Fig. 1)
   How? OSPAR Marine Litter Monitoring Protocol
2. Identification of the FG according to their fishing fleet (Fig. 2)
3. Polymer analysis through ATR-FTIR spectroscopy

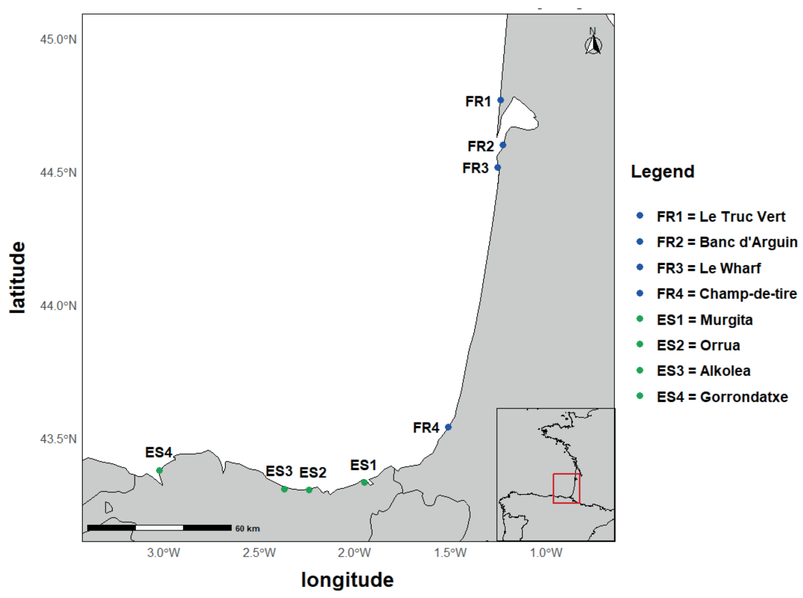

Fig. 1 : Studied area of the Plasfito research project and sampling beaches.

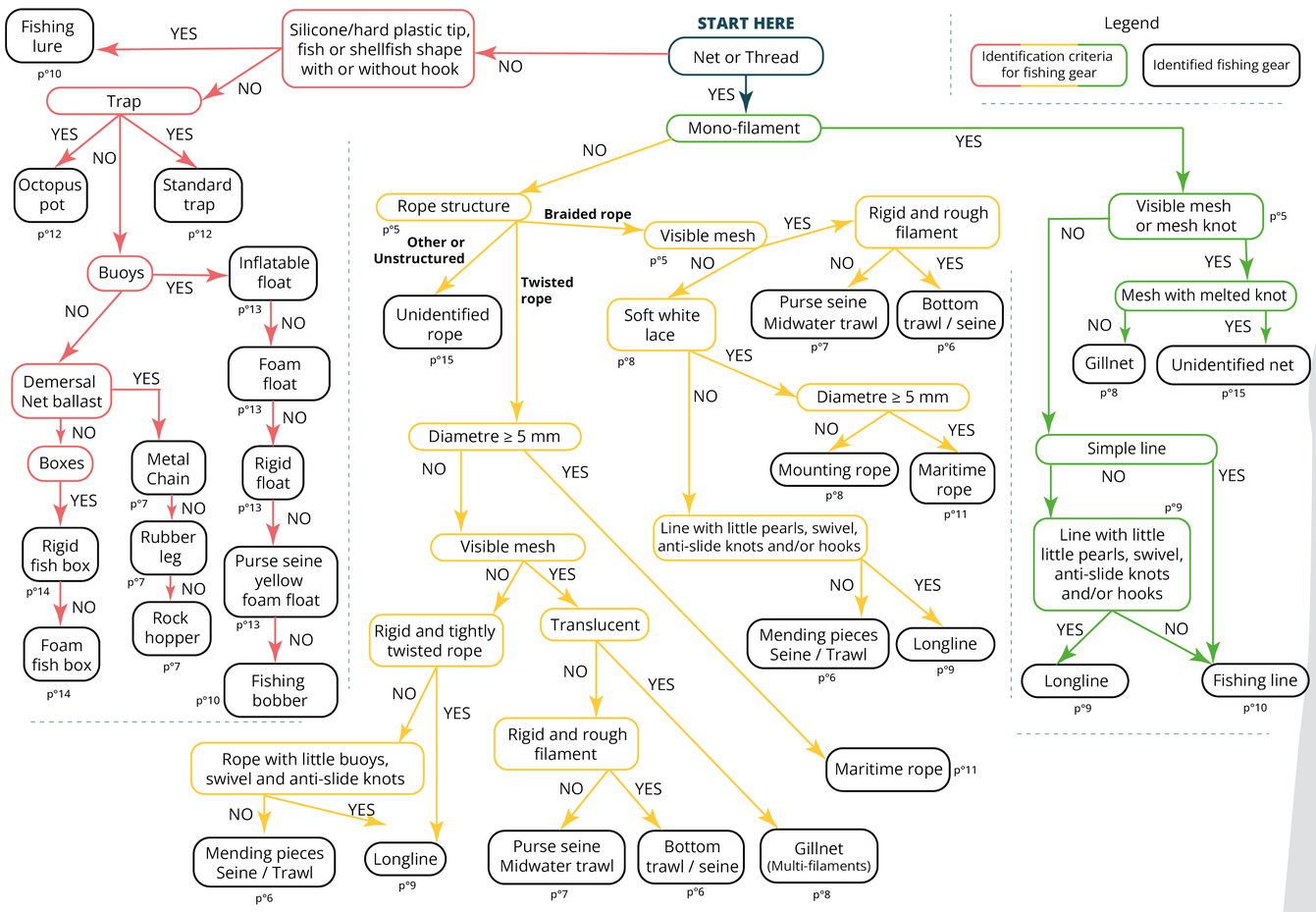

Fig. 2 : Identification key for abandonned, lost or otherwise discarded fishing gear.

RESULTS & ADVANTAGES OF THE NOVEL ID-K?

- Enable the identification of FG based on the fishing fleet they are used for and allow for the exclusion of items not related to the maritime sector.
- 14,462 items of plastic waste collected, 10.3% (1,486 items) of which came from the fishing and maritime sector.

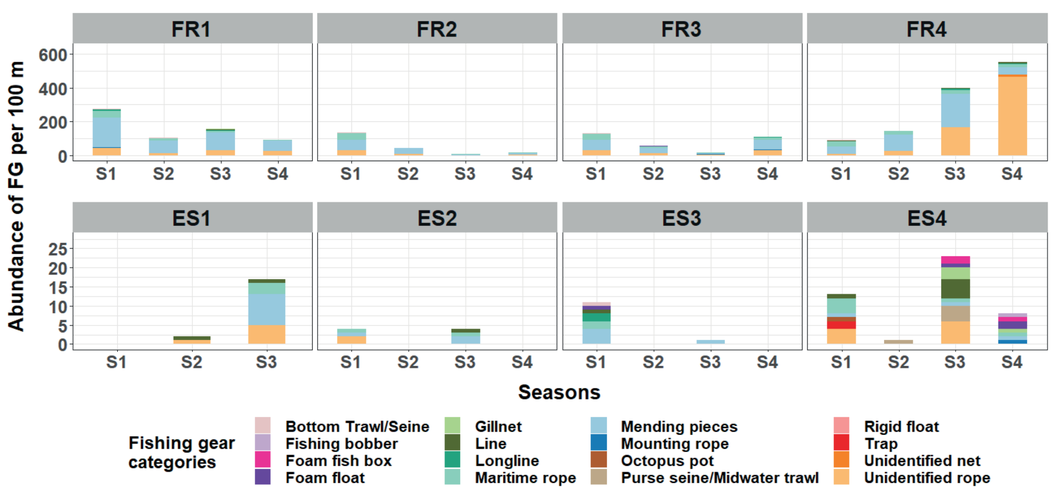

Fig. 3: Total amount of FG items collected by beach and by season. S1 = winter 2022-2023; S2 = Spring 2023; S3 = Summer 2023; S4 = Autumn 2023. ES1 S4 not sampled due to bad weather.

- Most of the FG found are mending pieces (45.1%), unidentified ropes (37.6%) and maritime ropes (11.5%)
- Higher seasonal average of ALDFG on French sandy beaches (145±175 items/100m) than on rocky shores of the Basque Country (Spain) (6±7 items/100m)

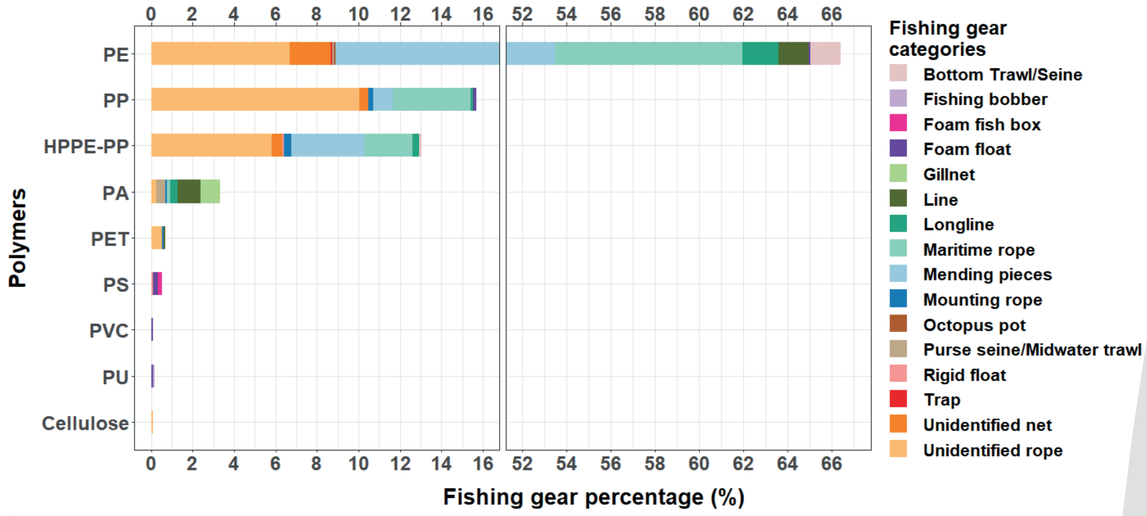

Fig. 4: Percentage of the polymer according to the fishing gear

- Predominance of ALDFG in PE, PP and HPPE-PP (polysteel).
- PA items mainly from gillnets and longlines, have rarely been found.

Main hypothesis: the PA buoyancy is negative, and they are often lost with their weights. Thus a large part of lost FG is deposited on the seafloor and does not reach the shores.

CONCLUSIONS

- Mending pieces from repairing FG and their direct discarding into oceans or docks seem a relevant source of ALDFG. This type of ALDFG could be relatively easy to address.
- PA gear make up a large portion of lost FG, yet they rarely wash up on shores.
- Identifying the fisheries of origin is crucial for better managing plastic pollution from ALDFG.

FUNDINGS & PARTNERS:

References & Resources