

Reference : **C.1 – C.1.2 – 1 - CLS**



**Connected fishing gear:
for better management of resources and the environment,
and towards a possible circular economy recycling initiative**

*Call for projects to promote innovative and experimental projects
with strong potential for reproducibility or transferability*

ACTOR AND TERRITORY



CLS – Satellite Location Collection
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A project carried out in
the VAR department (83)

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CONTEXT

The project proposed and supported by CLS and its partners consists of carrying out an experiment in the Mediterranean, with the stakeholders concerned in the fishing industry, of a solution for marking fishing gear using satellite micro-tags. The primary objective is to enable the geolocation of gear to prevent it from becoming marine waste and permanently destroying the resource (ghost fishing). This program must also be part of a circular economy approach allowing the recovery and then valorization of this gear, for example within the framework of an EPR sector.

OBJECTIVES AND RESULTS

General objectives

- Define, design, prototype and deploy a suitable marking solution for surface and submerged vehicles, based on solutions already developed by CLS, to be adapted to local needs identified during the project,
- Consolidate through experimentation at sea and with local stakeholders all the operational benefits of such a system. The operational benefits of such identification/geolocation being:
 - o Remote monitoring of devices deployed at sea,
 - o Facilitated recovery to increase the chances of implementing a dedicated local EPR sector, and thus better protect the marine environment (plastic pollution but also fight against ghost fishing which is decimating the resource),

Quantitative objectives

- Prevent theft and loss of devices (and catches/contents) between fishermen ,
- Faster recovery at sea for greater efficiency (less time at sea = less pollution),
- Building, based on what already exists, and with local stakeholders, a solution well adapted to the needs and Mediterranean context, while considering the good replicability of the system, in other territories in mainland France, in French overseas territories and more generally for export,
- With our partners ReSeaclons and Planète Mer, study how such a system would promote the implementation of an EPR sector dedicated to the recovery and recycling of fishing gear, locally and replicable in other territories.

Deploy a representative number of prototypes (10-30) to several fishermen, in several departmental committees in the Region .

Quantitative results

Initial evaluations of 5 satellite tag prototypes from 3 different suppliers including CLS. Development of 2 satellite beacon models for marking fishing gear (NAOS beacon and rechargeable NAOS).

Development of 2 sea visualization systems (Radio and Satellite), and a smartphone configuration application.

Sea tests with 7 fishermen in 4 ports with provision of a total of 20 prototype beacons

Sea trials of several prototypes and systems have enabled:

- Collect feedback from artisanal fishermen,
- Consolidate the various needs related to the monitoring of fishing gear,
- Gradually improve tags and data visualization systems.

Qualitative results

The project thus directly contributed to the industrialization phases and then the start of marketing of 2 types of beacons.

In addition, a seminar was organized at the end of the project in La Seyne-sur-Mer to:

- Share feedback on the use of these systems by fishermen,
- Discuss the recycling of fishing nets and the possibilities of setting up an EPR sector.

IMPLEMENTATION

Description of the action

1. Raising awareness among user stakeholders
2. Review of specifications for improvement of prototypes
3. Production of improved prototypes (a small series)
4. Deployments at sea and collection of feedback
5. Preparation of a downstream sector (starter) for recovery
6. Sharing feedback and possible implementation of a fishing gear recycling sector

Planning

2021: Initial evaluations and support for the development of prototypes, contact with fishermen, awareness raising of the ecosystem and local stakeholders.

2022: Industrialization of the NAOS beacon and continued technical developments for data processing servers, at-sea visualization systems (radio and satellite), smartphone applications; meeting with fishermen and start of at-sea tests.

2023: Start of marketing of the NAOS beacon, continuation of sea tests with rechargeable version of the NAOS beacon, collection of feedback from fishermen, installation of communication panels for the general public in La Londe Les Maures and La Seyne-sur-Mer.

2024: Continuation of sea tests and product improvements, Organization of a project seminar with on-site visit (feedback and recycling of fishing nets). Start of marketing of rechargeable NAOS beacon.



Balise NAOS



Human resources

CLS and Partner Staff

Financial means

Total cost of the project: €706,200

Technical means

Prototypes of tags, processing chains, airtime , data access portal.

Mobilized partners

2 associations: Planet Sea and ReSeaclons.
A partner for electronics: Cabelvar , in Var (83).
A scientific partner for advice: IFREMER in La Seyne-sur-Mer (83).

FEEDBACK AND REPRODUCIBILITY

Success factors

Ability of the location system to assist fishermen in their operations to avoid loss of fishing gear at sea.

Difficulties encountered

For artisanal fishermen, the complexity of using sea visualization systems minimizes the operational contribution of the system in their fishing operations. In addition, the cost of the system remains a significant obstacle to mass use.

Recommendations

While the tags developed are effective in combating the loss of fishing gear at sea, the improved performance of the system, with the arrival of the Kineis satellite constellation , will allow for more efficient operational use. However, for the needs of artisanal fishing, the sea visualization systems still need to be simplified. Alternative and/or complementary uses such as use by managers of parks or marine protected areas should also be promoted in order to allow fishermen to equip themselves.