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Enhancing biodegradable fishnets to promote sustainability:

a pilot study in the Northern Littoral Natural Park

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Enhancing biodegradable fishnets to promote sustainability: a pilot study in the Northern Littoral Natural Park

Main objectives:

- **To implemente a pilot study in the Marine Protected Area of the Northern Littoral Marine Park, were degradable gillnets and trammel nets will be provided to the fishing community in an unprecedented pilot test. The effect of this initiative on the reduction of ghost fishing and of synthetic plastic materials in the ocean will be assessed;**

- **To assess the sustainability of using biodegradable materials *versus* conventional synthetic gear considering economic (costs and local economy), environmental (ecosystems health and biodiversity) and social (traditions and local practices) factors;**

- **To identify litter sources and evaluate the amount and nature present on beaches. This information is crucial to take action against the sources of marine litter and help to design future management measures to tackle this challenge, based on systematic and consistent monitoring to provide decision makers with the evidence needed to take action;**

- **The promotion of awareness in the community.**

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Project budget is 249.237,61€, co-financed with 199.390,09€.

Promoted by Esposende Municipality in a partnership with the Municipal Company - Esposende Ambiente, a University of Minho and Rio Neiva - Environmental Defense Association. It will run for 18 months.

Through the Agreement on the European Economic Area (EEA), Iceland, Liechtenstein and Norway are partners in the internal market with the Member States of the European Union.
As a way of promoting a continuous and balanced strengthening of economic relations and trade, the parties to the EEA Agreement have established a Financial Mechanism multiannual, known as EEA Grants.

The EEA Grants aim to reduce social and economic disparities in Europe and to strengthen bilateral relations between these three countries and the recipient countries.

For the 2014-2021 period, a total contribution of € 2.8 billion was agreed for 15 beneficiary countries. Portugal will benefit from a budget of 102.7 million euros.

Learn more at **eeagrants.gov.pt**

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Did you know?

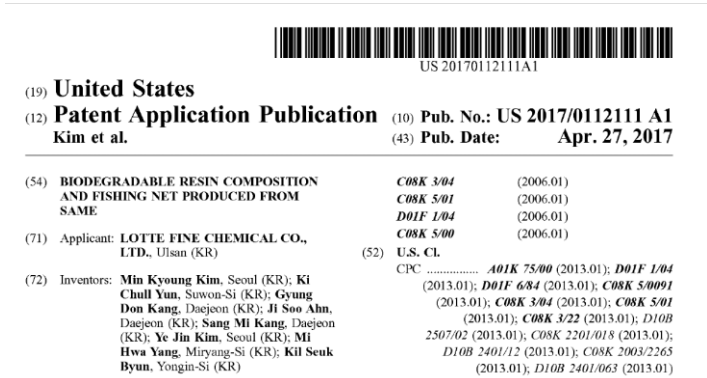
Lost gear promotes continuous capture of target and non-target species, causing depletion of resources, both economically and ecologically.

Task 1.

Prospecting and obtaining biodegradable resins for fishing gear production

There are already available on the market biodegradable PBSAT and PBS resins specifically designed for the manufacture of monofilaments to be used in fishing nets.

The present task consists of market research, supplier selection and material acquisition.



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(54) **BIODEGRADABLE RESIN COMPOSITION AND FISHING NET PRODUCED FROM SAME**

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Task 2.

Selection, certification, durability, resistance and biodegradability tests to biodegradable resins for the production of fishing nets

The new filaments will be tested in the laboratory, in order to obtain mechanical characteristics of resistance and deformability;

A thorough study and update of the state of knowledge will be conducted in order to determine the physical properties to be measured, the procedures to be adopted in the characterization of the degradation of biodegradable monofilaments and to promote the capacity building for producing fishing gear from selected biodegradable monofilaments.

Possibilities of inserting sensors in the fishing gear will be explored to allow the monitoring of critical variables to be identified, during the life span of the gear at sea.

This information is essential in the design phase, to allow the validation and extrapolation of the results obtained in the laboratory.

Did you know?

The synthetic materials used in the manufacture of nets end up degrading into microplastics that enter the marine food chain.

These particles are a problem for all living organisms, including man, since their ingestion can cause serious health problems or even death.

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Did you know?

Fishing gear abandoned on the seabed cause changes to the benthic environment and harm sensitive species such as corals and gorgonians.

Task 3.
Manufacturing fishing nets from biodegradable materials

Fishing industry is dependent on reliable equipment and gear is targeted for commercial species.

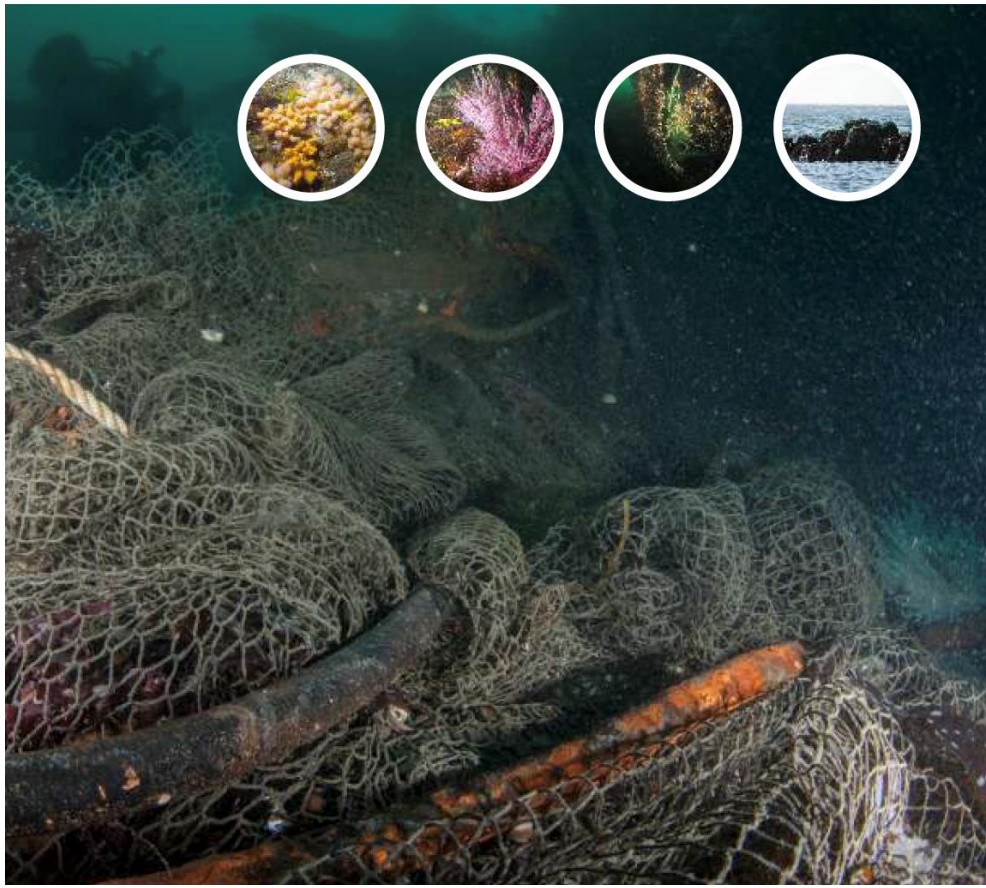
The fishing nets will be manufactured according to the characteristics of the gear used locally, namely gillnets and trammel nets.

It is expected to manufacture 2,000 cloths that should equip 1/2 of the local artisanal fleet.

The fleet will be equipped for a period of one year, however being able to use conventional materials in parallel.

The manufacturing of biodegradable nets will be optimized in collaboration with local manufacturers who currently produce using traditional filament.

The process will require some industrial development, as there will be a need to adapt the manufacturing process to the characteristics of the new filaments.



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The amount, distribution and effects of lost fishing gear have risen substantially in past decades with the rapid expansion of fishing effort and the use of synthetic, durable and buoyant materials.

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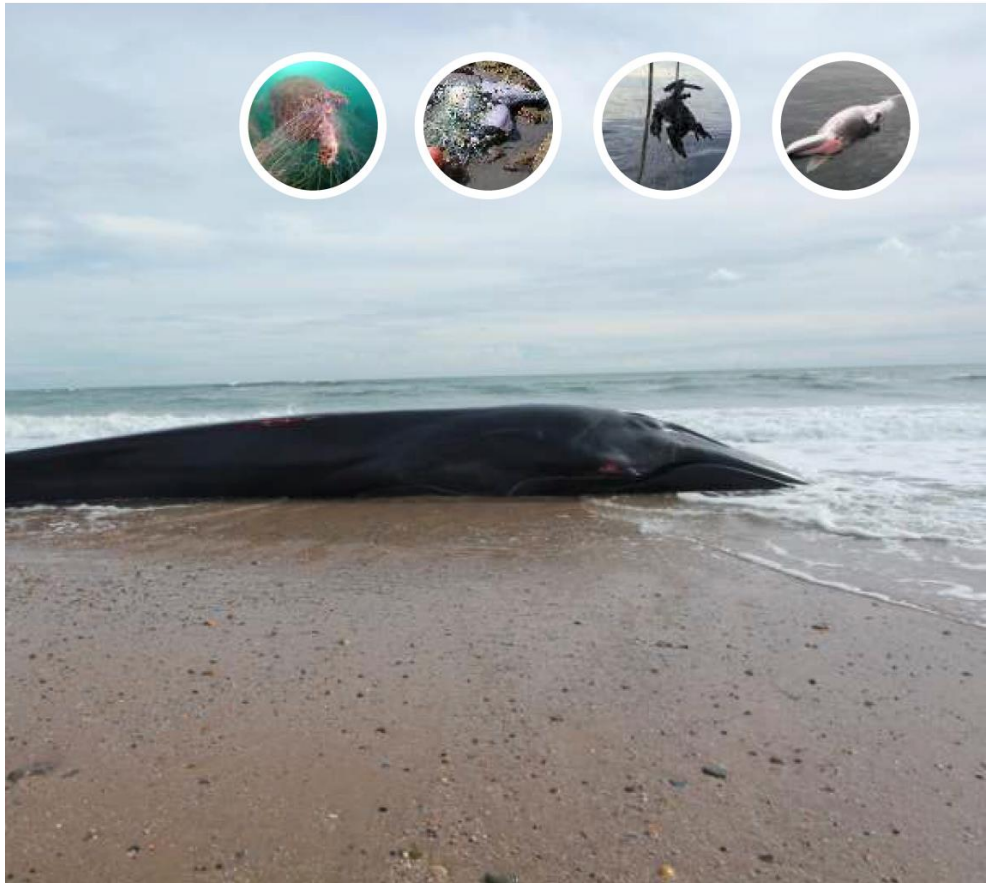
Did you know?

Non-commercial species
are also affected by the “ghost gears”
such as birds, marine mammals and turtles.

Task 4.

Catch efficiency test of nets produced with biodegradable materials compared to conventional nets



Biodegradable fishing nets will only be accepted if their catch efficiency is identical to the obtained using conventional gear.

As an increased cost of biodegradable nets over conventional ones is expected, their future use can only be ensured if the fishing community is perfectly aware of its catch efficiency.

Comparative experimental fishing campaigns between conventional and biodegradable gear will be carried out in order to present rigorous results that prove, or not, the efficiency of the proposed solution.

Dedicated and comparative experimental fishing campaigns will be carried out in order to statistically validate the results. In addition, the mechanical characteristics of the gear will be tested in the laboratory, in order to characterize the behavior of the filaments.

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Did you know?

As artes de pesca perdidas no mar
podem constituir um perigo à navegação,
Ao emaranhar-se nas hélices das embarcações.

Task 5.

Economic feasibility study on the use of biodegradable fishing nets on a regional scale

Quantify and classify the local fishing effort, the type of gear used and to estimate the economic outlook for the exclusive use of biodegradable nets in the region.

With the support of the Professional Association of Fishermen of the Municipality of Esposende opinions on the efficiency and durability of gear will be collected from fishermen equipped with biodegradable gear. The industry associated with the production of fishing gear will be analyzed, in order to obtain a complete characterization of the different economic and social dimensions of fishing activity in the region.

Support the analysis of the expected impacts as a result of a paradigm transition based on the use of biodegradable products.

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Did you know?

Many of the fishing gear lost at sea
end up being ashored to the beaches,
and are responsible for much of the marine litter
found.

Task 6.

Campaigns for removal, quantification / spatial distribution and typification of ashored marine litter

Data collection on ashored marine litter on beaches will provide information on the quantities, trends and sources of marine litter.

This data can be used in effective mitigation measures and to test the effectiveness of existing legislation and regulations. The ultimate goal is to reduce the amount of marine litter that enters the marine environment.

Carry out bimonthly campaigns to remove and quantify ashored fishing gear to the beaches of the municipality of Esposende.

Spatial distribution maps of ashored fishing gear will be created. The marine litter found will be removed, weighed, typified and stored until transportation. The provenience will, whenever possible, be identified. This action will allow to quantify the pre and post-implementation significance of the project as a decrease in the amount of ashored conventional fishing gear is expected.

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Did you know?

Fishing gear lost at sea
can travel hundreds or thousands of kilometers, enhancing the introduction of invasive species.

Task 7.
Transport, recycling and / or reuse of marine litter

Marine litter recovered from the seabed or washed ashore is usually deposited in landfills. However, litter can be transformed and regenerated into high quality materials for the manufacture of textile products;

In collaboration with waste management and recycling companies, the collected material will be sorted and treated for reception by local recycling companies associated with the project, namely nylon fibers for transformation into econylon.

The marine litter collected through the removal campaigns will be treated and prepared for reception for recycling.

The marine litter will be processed to be incorporated into shoe soles through collaboration with a brand of ecological shoes to give new use to the collected waste.

Foster practices of environmental citizenship and promotion of the circular economy.

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Marine pollution caused by non-biodegradable plastics has become one of the most serious problems worldwide.

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Task 8.
Communication plan

The communication plan intends to bring the fishing community together, and to clarify the advantages of the use biodegradable nets.

A boat-to-boat approach is expected as some resistance is expected from fishermen to alter the use of proven and efficient materials.

Online communication tools will be created, namely a website and a page on social media where project activities and issues will be approached.

It is planned to create short videos that address the marine litter issues and the solutions to be disseminated. Volunteer sessions for beach cleaning will be organized.

Promote a seminar with invited scientists from Norway, in particular from SINTEF, to share previous experiences in studies on the application of biodegradable fishing nets.

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Expected results:

The main objective of the operation is the reduction of plastics in oceans of origin in terrestrial activities, namely lost, abandoned or discarded fishing equipment. In addition to promoting continuous capture of target and non-target species, this equipment causes a variety of negative impacts on ecosystems and contributes to the introduction of non-biodegradable synthetic plastic materials, either in the form of marine litter or in the insertion of microplastics in the food chain. These processes cause economic losses associated with loss of biodiversity, mortality of commercially exploited species and recovery and cleanning operations costs. Marine pollution caused by non-biodegradable plastics has become one of the main threats to environmental sustainability on our planet. The main origin of these plastics is associated with fishing activity, so this proposal proposes the evaluation of a solution to the problem by studying the effectiveness that the use of biodegradable nets could have, in a pilot study with unprecedented size and representativeness.

Additionally, through bold marine waste removal campaigns, which will be transformed and reused, it is also intended to contribute to a greater knowledge and awareness of the problem, as well as to evaluate the efficiency of the use of biodegradable gear by the local community. Transversely, the implementation of an active communication plan will raise awareness of the target communities on the subject. It will also promote the adaptation of the industrial community associated with the fishing sector, in order to adopt new procedures and new biodegradable products with less environmental impact, resulting in the establishment of new paradigms for the industry.

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Promotor:

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Parceiro:

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