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BIODIVERSITY RESULTS OF A NATURE-INCLUSIVE CABLE PROTECTION SOLUTION

BACKGROUND

As part of the subsea interconnection project between the islands of Fuerteventura and Lanzarote, Red Eléctrica, the Spanish Transmission System Operator, selected ECOncrete technology for the design of an innovative, nature-inclusive cable protection solution.

2 years after installation, Red Eléctrica and ECOncrete have demonstrated the benefits of the solution to **simultaneously shield the cable from external damage while restoring reef habitats and associated marine biodiversity.**

The two companies have launched a monitoring study with the main objective of assessing biological growth within the ECOncrete cable protection solution (trench protection units) and the surrounding reef, including detailed documentation of species composition and measurement of biodiversity indices.

July 2024

APPLICATION
Offshore

PRODUCT
Cable protection units

Between Lanzarote and Fuerteventura Islands

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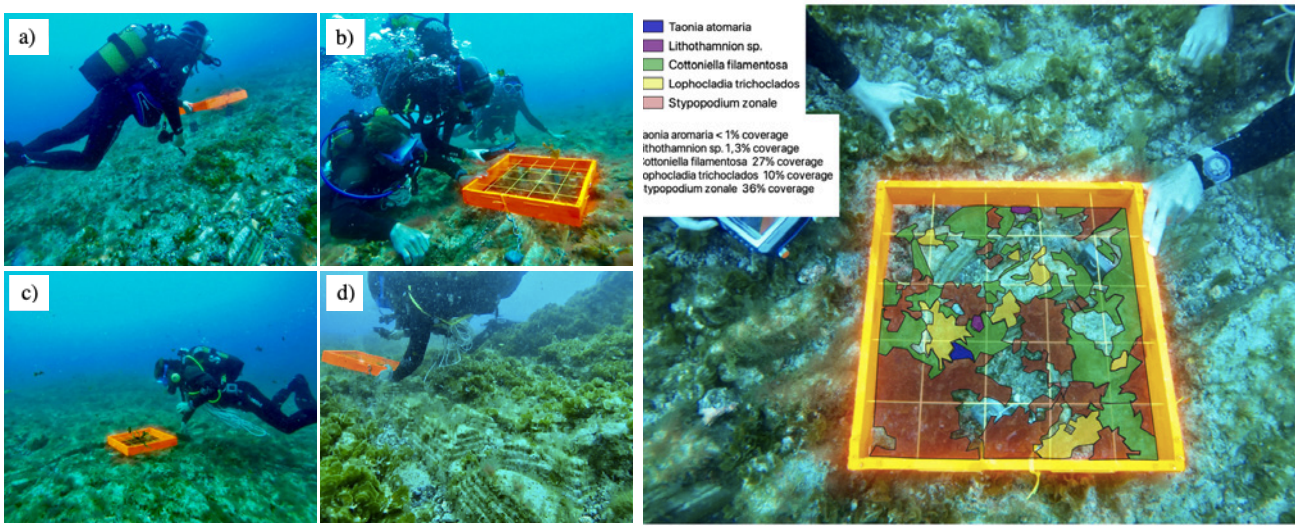
This case study presents the preliminary results of the monitoring of the ECOncrete trench protection blocks which started in March 2024:

- Promoting algal colonization, serving as attractants for diverse benthic species and small fish
- Demonstrating analogy with adjacent natural reef habitats
- Showing high biodiversity value compared to adjacent reef environments



NATURE-INCLUSIVE CABLE PROTECTION SOLUTION

When designing the submarine interconnection cable route, Red Eléctrica explored various measures to minimize potential impacts on the marine environment. These measures included planning a cable route through sandy areas and favoring jetting methods over trenching. However, in a specific rocky seabed area of the project, there was no alternative but to open a trench using the specialized “rock trenching” method.


Adjacent Reef Environment

The affected area is classified as a natural reef habitat of community interest by the EU Habitats Directive.

In addition, considering the need to preserve the rich marine biodiversity present in the reef habitat and the surrounding Marine Protected Area (Natura 2000) between Lanzarote and Fuerteventura, it was necessary to design new corrective measures to mitigate the additional impact on the local fauna and flora.

To provide a nature-inclusive alternative, ECOncrete bio-enhancing concrete technology was selected to design the cable protection required to cover the trench and protect the cable. The result is a trench protection unit custom designed to restore the reef habitat features and promote marine biodiversity, while at the same time meeting the specific engineering and project requirements.

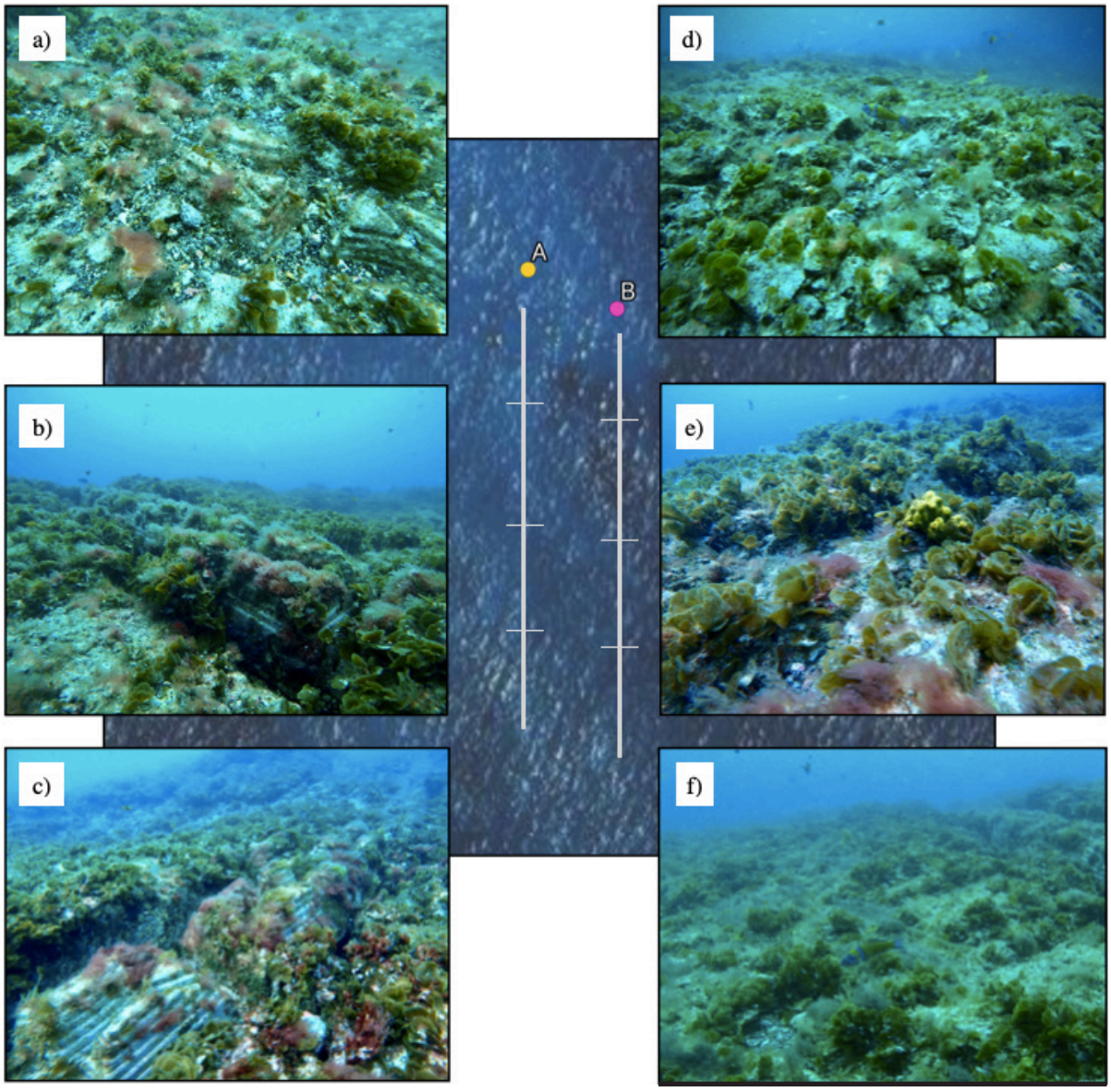

Custom Designed Trench Protection Unit

The interconnection project includes monitoring to study all environmental parameters, including the evolution of marine life on the trench protection units. After a year of installation, an initial biological monitoring study has been defined to characterize in detail the species that are colonizing the units and to obtain a comparison with the dominant species in the natural environment. The study is based on the systematic observation of how algae colonize these artificial structures and the progressive reintegration of fauna into this environment.

MARINE BIODIVERSITY RESULTS

In this study, the ECOncrete units have been compared with the proximate natural reef at a distance of 10 meters parallel to the ECOncrete structures.

- Using the LIT methodology, the study compiled a taxonomic inventory with a total of 14 identified species. On ECOncrete units a total of 52 organisms have been recorded, including 8 different species. In contrast, in the natural reef, only 25 organisms belonging to 6 different species have been recorded. The biodiversity index has been calculated for both areas with respective values of 1.774 for ECOncrete, and 1.588 for the natural reef ; **indicating a healthy and stable ecosystem**.
- For the assessment of colonization success, photo quadrates were used for the analysis of the percentage of algal coverage in a defined area. ECOncrete units had a total mean coverage of 79.9% compared to 98% in the natural reef.



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STUDY TAKEAWAYS

This study provides a detailed insight into the current species inhabiting the ECOncrete trench protection units compared to the proximate natural reef habitats. The results obtained demonstrate that the units promote algal growth and **create optimal conditions for recolonization by diverse marine organisms**. The wide range of ecological niches occupied by different organisms indicates a healthy and stable ecosystem with high biodiversity which is associated with greater resilience to environmental disturbances and changes in the environment. A notable analogy with adjacent natural reef habitats has been observed, thus evidencing the ability of these units to **integrate cohesively into marine ecosystems.**

SUSTAINABILITY COMMITMENT

Based on the need to limit the impact of subsea project on the local marine ecosystems and anticipating new regulatory requirements for more nature-inclusive marine infrastructure, this study provides a unique opportunity to validate the potential positive impact of nature-inclusive cable protection infrastructure on the marine environment and biodiversity.

The study preliminary results not only enhance our understanding of the effects of the project on marine biodiversity but also underscore its potential to mitigate impact and drive restoration and conservation efforts of protected marine habitats.

The integration of ECOncrete technology into the project aligns with Red Eléctrica's commitment to sustainability and to generate a positive net impact on the natural capital (SDG 2030 goals), by reducing projects environmental impact to a minimum and favoring biodiversity recovery.

For ECOncrete, the project provides a blueprint for the use of its technology for the design of nature-inclusive cable protection systems beyond its validated marine mattress solution.

For further details and photo, video and scientific monitoring reports, please reach out to info@econcretetech.com

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ABOUT RED ELÉCTRICA

Red Eléctrica is the sole transporter and operator (TSO) of the Spanish electrical system. As the backbone of the system, it guarantees secure, high-quality, and increasingly renewable electricity supply, operating under principles of transparency, objectivity, independence, economic efficiency, and a strong commitment to sustainable development. Currently, it manages 45,000 km of power lines. It is one of the five subsidiaries of Redeia, a global manager of essential infrastructure and a driving force behind the energy transition and universal connectivity, with a presence in Spain, Peru, Chile, and Brazil.

ABOUT ECONCRETE®

ECOncrete has developed a unique bio-enhancing concrete technology designed to enable the construction of nature-inclusive marine infrastructure. The patented technology includes a concrete admixture, surface complexity and nature-inspired design, as well as seamless integration into standard manufacturing and installation processes.

The company comprises interdisciplinary teams of experienced marine biologists, engineers, industrial designers, and architects developing tailored solutions for coastal and offshore applications. ECOncrete solutions has been implemented in more than 50 projects globally including ports, piers, breakwaters, subsea and other load bearing infrastructures.