# North Devon's Blue Forest project pioneers regenerative aquaculture to boost biodiversity and capture carbon



A partnership between local entities and the Blue Forest Project has marked a significant step forward in regenerative aquaculture, with the recent installation of ropes for a mussel and seaweed farm off the coast of North Devon. This initiative, spearheaded by Lundy Puffin in collaboration with the aquaculture company Algapelago, aims to enhance marine biodiversity and improve water quality through innovative farming practices.

Recent research conducted by the sustainability consultancy Tunely Environmental, alongside Algapelago, highlights the dual benefits of cultivating sugar kelp in tandem with blue mussels. Described as a promising method of regenerative aquaculture, this approach not only produces food but also contributes substantially to climate action by aiding in carbon capture and the restoration of marine biodiversity. Nora von Xylander, a marine biodiversity specialist at Tunely Environmental and an author of the report, noted, “These production systems not only produce food for human consumption, they also contribute to the health of marine ecosystems.”

The findings draw on successful models from Scandinavia and France, where similar polyculture systems have shown enhanced efficiency and cost-effectiveness. For instance, Norway's marine farms have been grappling with excess waste from mussel cultivation; researchers are now examining the potential of pairing mussels with seaweed, creating a mutually beneficial ecosystem where mussels clean the water and seaweed absorbs nutrients vital for their growth.

At the heart of this initiative, the Blue Forest project currently spans 5 hectares and is permitted for future expansion up to 116 hectares. Once fully realised, it is projected to remove approximately 23 tons of nitrogen, 1 ton of phosphate, and 283 tons of carbon dioxide from the surrounding waters yearly. Such ambitious goals are not merely theoretical; underwater cameras have captured compelling evidence of marine life returning to previously degraded seabeds, an indicator of the project's environmental impact. “There’s more marine life than there used to be,” von Xylander shared, emphasizing the cultural significance of this restoration alongside its scientific merits.

Beyond the ecological advantages, the project aims to reconnect local communities with maritime traditions that have faded over time. von Xylander pointed out the cultural value of restoring skills and knowledge associated with traditional sea farming practices, stating, “People forget that England is an island. There’s cultural value in bringing back this kind of knowledge and involving local communities.”

However, the economic viability of regenerative aquaculture remains a fundamental hurdle. Increasing public awareness of the nutritional benefits of seaweed is pivotal, as its role in global diets expands beyond its traditional use in sushi and Asian cuisine. Von Xylander remarked, “Seaweed is a superfood,” signalling an encouraging trend towards integrating it into UK and European diets.

Despite the optimism surrounding these initiatives, challenges persist. The need for funding to scale operations is pressing. Algapelago currently operates on a modest five-hectare area, yet it has plans to expand significantly. “To go large-scale, you need more funds,” von Xylander emphasised, highlighting the necessity for investment in sustainable aquaculture practices.

Thoughtful site and species selection are crucial to the project’s potential success. Von Xylander warned that misplacing a farm could lead to negative ecological consequences; thus, a thorough understanding of local ecosystems is essential. The project utilises native species, tailored specifically to the coastline of North Devon. She added that expanding regenerative aquaculture across Europe will require context-specific strategies to avoid introducing incompatible species, underscoring the importance of cultural and ecological knowledge in marine farming.

The research has illuminated a path for expansion beyond the UK, particularly in Southern Europe, where countries like Italy, Portugal, and Spain are exploring regenerative aquaculture solutions suited to their unique coastal conditions. This trend offers a glimmer of hope in addressing the biodiversity crisis, which has largely overshadowed marine concerns until now. Von Xylander remarked, “A big aspect of our biodiversity crisis has focused on land, but as a marine scientist, it’s encouraging to see more initiatives at sea. If we do it right, it can lead to real change.”

This move towards integrating ecological restoration with sustainable food production may herald a new era in marine farming, one that fosters both environmental and community revitalisation.

### Reference Map

1. Paragraphs 1, 2, 3, 4, 5, 8
2. Paragraphs 2, 4, 5
3. Paragraph 2, 3
4. Paragraphs 1, 2, 5, 6
5. Paragraph 6
6. Paragraph 3
7. Paragraph 3

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.triplepundit.com/story/2025/aquaculture-water-quality-biodiversity/821091> - Please view link - unable to able to access data
2. <https://www.triplepundit.com/story/2025/aquaculture-water-quality-biodiversity/821091> - This article discusses a study by Tunely Environmental and Algapelago, highlighting how cultivating sugar kelp alongside blue mussels in regenerative aquaculture enhances water quality and biodiversity. The Blue Forest project in North Devon, England, exemplifies this approach, aiming to extract significant amounts of nitrogen, phosphate, and carbon dioxide annually. The initiative also shows signs of marine life returning to previously degraded seabeds, indicating both environmental and cultural successes. The article emphasizes the importance of restoring seaweed forests and mussel beds to address biodiversity loss and reconnect communities with maritime traditions.
3. <https://www.tunley-environmental.com/research-on-regenerative-aquaculture> - Tunely Environmental's research focuses on regenerative aquaculture practices, particularly the integration of sugar kelp and blue mussels. Their studies demonstrate how this combination can improve water quality by filtering excess nutrients and enhance biodiversity by providing habitats for marine life. The research also highlights the potential of such practices in carbon sequestration and combating nutrient pollution, offering sustainable solutions for marine ecosystem restoration.
4. <https://www.algapelago.com/blue-forest-project> - Algapelago's Blue Forest project in North Devon, England, involves cultivating sugar kelp and blue mussels together to create a balanced marine ecosystem. The project spans 5 hectares, with plans to expand to 116 hectares, aiming to extract up to 23 tons of nitrogen, 1 ton of phosphate, and 283 tons of carbon dioxide annually. The initiative has led to the return of marine life to degraded seabeds, showcasing the environmental benefits of regenerative aquaculture.
5. <https://www.fao.org/seaweed-farming-benefits> - The Food and Agriculture Organization (FAO) highlights the benefits of seaweed farming, including its role in improving water quality and providing habitat for marine life. Seaweed farming can mitigate nutrient pollution by absorbing excess nitrogen and phosphorus, thus enhancing biodiversity. The FAO also notes the potential of seaweed farming in carbon sequestration, contributing to climate change mitigation efforts.
6. <https://www.nature.com/articles/s41598-019-46035-0> - A study published in Scientific Reports examines the ecological benefits of integrated multi-trophic aquaculture (IMTA), where species like mussels and seaweed are cultivated together. The research demonstrates that IMTA systems can improve water quality by filtering excess nutrients and enhance biodiversity by providing diverse habitats. The study supports the use of IMTA as a sustainable aquaculture practice that benefits both the environment and marine life.
7. <https://www.sciencedirect.com/science/article/pii/S0048969719310190> - An article in Science of the Total Environment discusses the role of seaweed farming in mitigating eutrophication and enhancing biodiversity. The paper highlights how seaweed aquaculture absorbs excess nutrients, reducing harmful algal blooms and improving water quality. It also emphasizes the importance of integrating seaweed farming into coastal management strategies to restore degraded marine ecosystems and support biodiversity conservation.