

Siting for Sustainable Aquaculture

As the threat of climate change intensifies and the global population continues to grow, there is a pressing need to increase food production while easing pressure on the planet. An ambitious new project is unlocking aquaculture’s potential to provide a sustainable source of food for communities around the world.

Our fastest growing form of food production, aquaculture—or farming in the water—has surpassed the size of wild fisheries or the global beef industry. And it isn’t done growing; over the next decade, aquaculture production is expected to double. Because 90% of wild fisheries are overexploited, this expansion is necessary to sustainably secure the global seafood supply and support coastal livelihoods, particularly for women and Indigenous people.

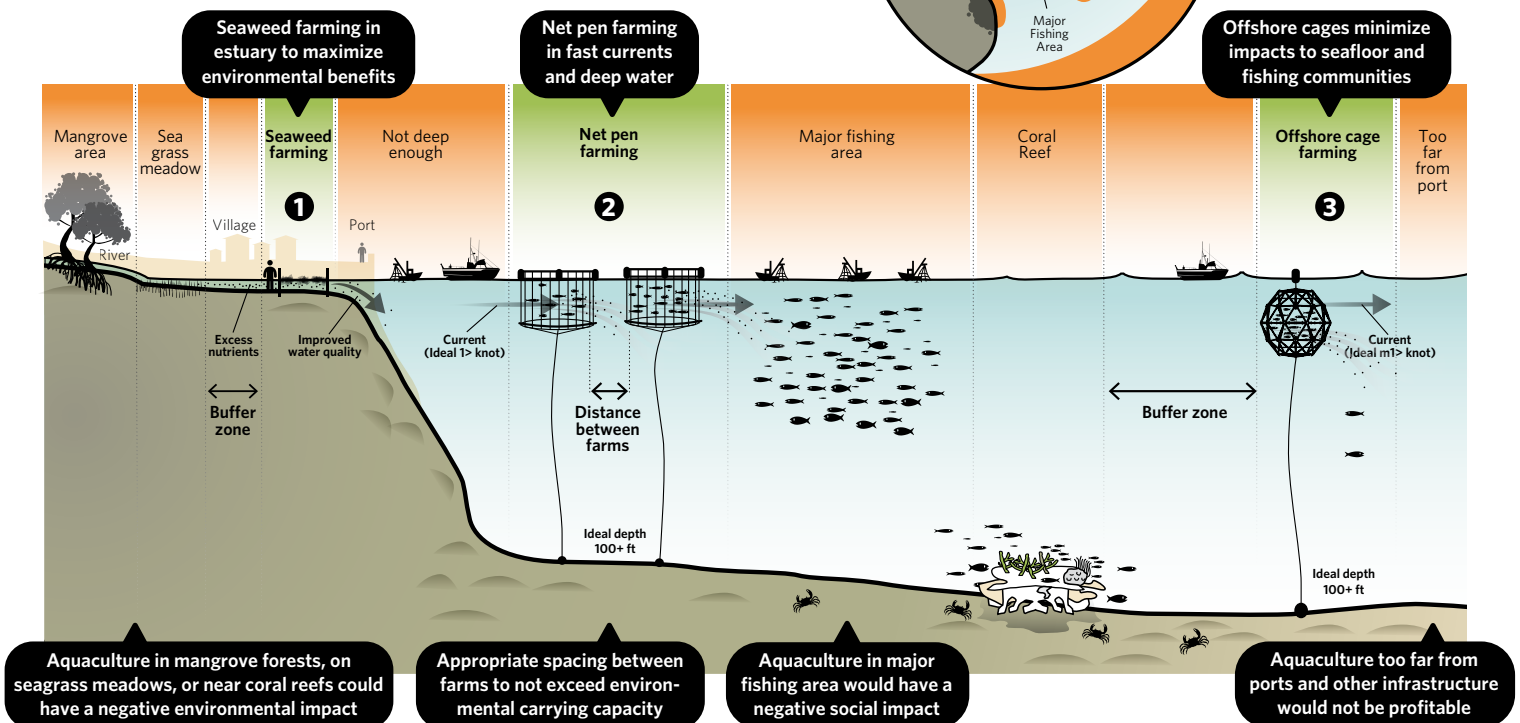
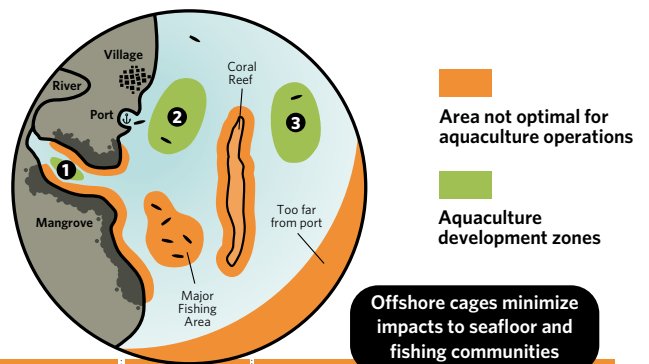
Though it’s an important source of food and jobs, aquaculture isn’t without its challenges. When poorly managed, it can degrade marine ecosystems; pollute coastal waters, lakes,

and rivers; and harm wild species through the transmission of disease and entanglement in gear.

Fortunately, these negative side effects aren’t inevitable. In fact, aquaculture has the potential to be one of our most sustainable forms of food production. A regenerative approach to aquaculture can increase biodiversity, improve water quality, and reduce carbon emissions, all while creating good jobs and providing a healthy, safe source of food for a growing population—a set of gains worth billions of dollars annually. Together, these benefits make aquaculture a prime candidate to be the world’s leading regenerative food system.

Smart Growth in Aquaculture

Siting of aquaculture operations is the first and most critical consideration to minimize negative impacts of aquaculture operations. It is also a critical factor in determining the profitability of an aquaculture operation. To protect the environment and ensure economic growth, aquaculture operations should be sited in optimal locations based on environmental, economic, and social factors.





Our Approach

The Nature Conservancy's aquaculture siting strategy is to get ahead of the game, working in geographies where the growth of the aquaculture industry could pose environmental threats and where science-based spatial planning could be most successful in the long-term. The efficacy of these efforts hinges on the relationships built on the ground, which foster ongoing support for and investments in sustainable aquaculture development. Additionally, we are continually exploring new methods to fill data gaps and generate more detailed models.

We first piloted this approach in Palau and are now working to bring the model to scale. In 2022, TNC launched new projects in Mexico and the African Great Lakes; across the Baja Peninsula and in Lake Tanganyika, TNC is collaborating with government and industry partners to embed the results of siting analyses and spatial planning tools into decision-making and the sustainable development of new aquaculture activities. This work is now expanding into Angola and French Polynesia, with additional opportunities being explored in Latin America.

In every project, we take a collaborative and science-driven approach:

- **Partner** with government managers, industry, and other stakeholders
- **Develop** comprehensive data and mapping tools
- **Build** long-term capacity within countries to sustain management of smart siting

Siting for Sustainable Growth

Sustainable growth in aquaculture depends on a number of factors, including the selection of species that can provide social and environmental benefits, the use of equipment and management practices that align with or enhance local ecological processes, and development at an intensity and scale that is appropriate for the local ecosystem. But even before that, it's essential that new projects are sited in suitable locations.

Marine habitats like mangrove forests and coral reefs are hotspots for biodiversity, cornerstones of climate resilience, and pillars of coastal economies worldwide, but they have been on the decline for decades and continue to face threats from development, pollution, and climate impacts. Smart siting—using advanced remote sensing, satellite imagery, and data-driven modelling and forecasting—can help prevent aquaculture from negatively affecting aquatic species or habitats while also ensuring farms can be economically viable.

Our Focus on French Polynesia

Under a memorandum of understanding with the Presidency of French Polynesia, TNC is working with the government's Direction des Ressources Marines (Directorate of Marine Resources) to complete a high-resolution aquaculture siting analysis and support a spatial planning process.



FOR MORE INFORMATION about TNC's aquaculture siting strategy and to explore collaborating with us, contact:

- **Heidi Alleway, PhD, Senior Aquaculture Scientist** | heidi.alleway@tnc.org
- **Charles Daxboeck, BioDax Consulting** | biodax@mail.pf
- **Alex Filous, Micronesia Director of Sustainable Fisheries** | alex.filous@tnc.org