



Article 1 for Canon Oceans Alive & Project REEFrame Programme

Author - Darryl Owen, founder of Project REEFrame

“I grew up watching *The Undersea World of Jacques Cousteau* and the *Cousteau Odyssey*. I was three years old when he first showed us the wonders of the ocean on our old black and white TVs, and it was the start of a hypnotizing series of underwater landscapes and stories that lasted 15 years. It ignited a curiosity for the ocean in me that is still strong today”

Darryl Owen, founder of Project REEFrame, talks about the ocean as the lost frontier. He remembers the excitement as the public discovered the ocean on TV and in the cinema in the 70's and 80's, which created a whole generation of divers, underwater explorers and ocean enthusiasts.

Today, we have lost much of the “buzz” around life in the ocean and subsequent generations seem to be less interested, after all, with modern data overload there are so many competing areas of interest for young minds, what makes the ocean more interesting than, let's say, space travel?

Well, that's a very pertinent question – you may not realise that we know more about the moon than we do about the ocean. 71% of the planet is covered by water - 360 million square kilometers (139.7 million square miles) - and yet it remains under-explored and full of mystery and potential.

What we do know, is that the ocean is critical to humanity's ongoing health and survival. It produces more than 50% of the air we breathe – that's right, every second breath you take is produced by the ocean – and it also controls global temperature. Can you imagine UAE summers with a 20°C increase in temperature? Over 3 billion people in the world depend on the ocean as their main source of protein, and in these days of Net-Zero targets, it's important to note that the ocean absorbs just over 30% of the atmospheric carbon as the largest carbon sink on the planet, storing 50 times more carbon than the atmosphere.

However, sometimes the largest, most critical machines are dependent on the smallest component to keep them running efficiently. And that brings us to the main actor in this article, coral.

Coral reefs are the most biodiverse ecosystems on the planet, probably more so than tropical rainforests. With exploration and study of coral reefs still catching up with research of terrestrial ecosystems, new marine species are being discovered every year.

Coral reefs cover less than 1% of the ocean floor and support 25% of all marine life, they protect coastlines, feed communities, and are the nurseries of the ocean - but in the UAE, they are disappearing fast.

Increasing ocean temperatures and salinity due to climate change, coastal development, as well as pollution have all combined to create a stressful environment for corals. The good news is that we have the most adaptable and thermally resistant corals in the world in the Arabian Gulf, which makes them a global genetic treasure that we must protect at all costs. Working out what makes corals so resistant in our hostile marine environment may deliver the answers to saving other global treasures such as the Australian Great Barrier Reef.

Canon, as part of their global Oceans Alive initiative, selected Project REEFrame as their partner in the UAE to help to extend their investment into the global preservation of coral reefs.

Project REEFrame is a community initiative that restores vital marine ecosystems through Whole Site Restoration, combining coral reefs with seagrass, oysters, mussels, and mangroves. Founded in 2019, the prototype site was launched in Dibba, Fujairah and permits were secured in 2023 for a 40,000 m² large-scale restoration zone.

In partnership with the Ministry of Climate Change & Environment and the Fujairah Environmental Authority, Project REEFrame unites science, community action, and corporate partnerships to deliver measurable impact for biodiversity, climate resilience, and national Net Zero goals.

“Community, Education, and Measurable Impact are the three pillars of the programme, and we believe that actions speak louder than words. We need to get our youth excited about saving endangered marine ecosystems again, and that means we must show them what they will lose, why it matters, and provide the tools for them to do something about it” Darryl adds.

This is the crossroads where Canon and Project REEFrame met. The powerful combination of Canon imagery, educational outreach and a measurable, science-based conservation project designed for community participation.

The UAE Oceans Alive project will combine the creation of coral nurseries and a constructed reef with training on coral conservation, underwater photography and videography, using the resulting imagery to power a series of educational articles and community outreach events.

“The nursery structures will allow us to rescue 252 naturally broken corals per year and nurture them to a size that can be outplanted onto the constructed reef as their new permanent home. The corals will provide new habitat for a wide range of marine biodiversity” Darryl explains.

Corals are an ecosystem architect, which means once established, they provide the essential elements for settlement by other marine life. If we draw a parallel with human cities, we need three things for a city to thrive: somewhere to live (habitat), food, and work. If any one of those is removed, people start to leave.

The same is true on a healthy coral reef. It provides habitat, kickstarts the food web, and attracts all the “workers” it needs to maintain the ecosystem.

When ocean conditions degrade, coral will often start to bleach, which is the first sign of a declining reef. With care and improving ocean conditions, coral can recover, however sadly that is not always the case. Many UAE coral reefs have succumbed to extreme conditions that even our local “super corals” cannot survive. When that happens, we lose much of the marine life that they supported, and the overall local ocean ecosystem is detrimentally impacted.

The Oceans Alive project will provide an environment where trained conservationists can create the best conditions possible for coral to grow, with regular maintenance and monitoring to ensure that health problems are detected and addressed before they cause widespread coral losses.

Trained Canon employees will team up with volunteers from the community to take responsibility for the maintenance work on the nursery and reef structures. This takes the form of “underwater gardening” where divers inspect the structures and keep the “weeds” and predators at bay. Examples of these in the underwater environment include sponges and colonial tunicates that envelop the corals and prevent the corals from feeding, macro algal plant life that grows over the corals and smothers them, or drupella snails that love to eat the coral polyps.

Keeping the nurseries and reef clean from these competing organisms, monitoring for disease and measuring the corals is a labour-intensive process that requires 72 dives per year for each structure – that’s around 100 hours of work! Just like on a land-based farm, the work needs to be delivered week in, week out to ensure the crop is not lost.

Photography plays a key role in the monitoring process, and the cameras supplied by Canon will be instrumental in regularly capturing images of each coral for assessment and measurement by the analyst team. Canon employees will be trained to help analyse the coral images.

Cameras without photographers are not very useful, so the project will be training divers to use them underwater according to project standards.

Each quarter, Canon employees and members of the public will be able to participate in underwater photography and videography classes delivered by the Canon Academy. The images captured by the trained divers will be used by the coral analysts to derive the size and growth of the corals using specialised measurement software. These measures are recorded for project reporting and research purposes and are also shared with government and university research teams.

Our intrepid photographers and videographers will also have a second mission. As the corals attract new marine life to settle in the neighbourhood, they will be filmed to record the increase of biodiversity around the structures.

This is important for several reasons.

Firstly, we will be able to document how a reef ecosystem is formed, with marine creatures settling and turning the reef into an aquatic nursery, filling the space with new life. We will see herbivores arrive, which in turn will attract predators and other species as the food web builds itself into a balanced ecosystem. From a research perspective, we hope to use this work to help refine the definition of biodiversity credits in a constructed reef environment.

Secondly, we live in a desertic region with limited sources of protein on land, which makes ocean protein a critical element for local food security. Overfishing is a global problem, with fish takes outstripping the ocean's ability to replenish stocks, and increasing the number of fish in UAE coastal waters is an important component of the national security strategy. By creating new coral reefs in protected areas, we create new nurseries that will hopefully increase local fish stocks. Capturing photographic evidence of fish populations over time helps us to measure this effect.

Thirdly, the imagery will be used to curate exhibition galleries, educational videos and a coffee table book. Beautiful images of the weird and wonderful life found on the reef will hopefully inspire interest in curious minds and add to a new generation of ocean lovers who want to make a difference.

The best way to inspire a new generation is by working with young people, and Project REEFrame is actively working with UAE schools to bring the ocean into the classroom. Inspiring imagery combined with practical projects is a convincing combination to win young hearts and minds, and we hope to broaden our outreach in this area as a result of the Oceans Alive project.

So, to come back to the three pillars that form the Project REEFrame programme, the Oceans Alive project will help to build the **community** through active outreach and beautiful imagery, **educate** new project members in ocean conservation as well as underwater photography and videography, and create **measurable impact** through the

construction and maintenance of coral nurseries and a new reef in the ocean, providing a platform for new corals and marine biodiversity.

As the legendary jazz songwriter Johnny Mandel once said, "It Don't Get No Better Than That"!