

Ecolibrium

Overview

Our planet is currently at a pivotal crossroads, as every day we as humans are destroy habitats, endanger numerous species present, and accelerate climate change on a devastating scale. These tragedies are directly due to human impact and previously little to no effort is made to stop these actions. Creating awareness about these issues is the first step to making a change that is so desperately needed**.** *Even the smallest actions can lead to the largest impact*, and that idea inspired Ecolibrium.

With these disturbing changes to our planet, humanity has finally started to realize that actions are necessary and serious change is crucial. Among this heightened atmosphere of global environmental awareness, we aim to spread the word of positive change and conservation through our ecologically inspired artwork. By creating a multifaceted experience for the public, we aim to raise awareness about local and endangered species-- through both aquatic and terrestrial installations all over the world--not only for the benefit of the planet but the furtherment of scientific knowledge.

Background

Currently more than 60% of the world reefs are being threatened by human activities such as overfishing, destructive fishing methods, pollution, and development while 75% are undergoing thermal distress due to climate change. These numbers are expected to raise to more than 90% by 2030. (World resources Institute). Once specific example is the bleaching of the living coral reefs caused by increased levels of dissolved CO2 in the ocean -- linked to the burning of fossil fuels are causing ocean acidification, or the rise in the ocean’s acidity levels. The loss of the keystone species globally is catastrophic to the decline of biodiversity of the oceans, the decrease in the amount of CO2 that is removed by living coral, and the loss of habitat that numerous species depend on in these areas. Artificial reefs are already being utilized to assist in this problem while helping the natural reefs return and replenish.

Artificial Reefs

Artificial reefs are benthic structures that are typically man made and intentionally placed and are generally designed to protect, enhance, or restore marine ecosystems. They can be used for a wide variety of purposes such as increasing biomass in fisheries, renewing destroyed habitats, creating new environments, functioning as a breakwater, and more. Humans have been using artificial reefs for hundreds of years and taking advantage of the fact that many marine organisms are attracted to these structures. Fouling organisms that attach to the surface, algae’s, and predatory fishes have been known to increase in numbers when artificial reefs introduced (Randall 1963, Carlise et al 1964, Turner et al 1969, Fager 1971).

Artificial reefs construction has occurred in Japan for hundreds of years (Ino 1974) and in the united states since the mid 1800s (Stone 1974) and built primarily by private organizations or individuals or local governments (Stone 1974, 1982). Traditionally the low costs artificial reefs are built with discarded scrap or waste material such as cars, tires, and cement black (Bohnsack & Sutherland 1985). The Japanese, however, built specially designed artificial reefs mostly for commercial use and funded by the government (Motet 1981, Sheehy 1981, Vik 1982).

Artistic reefs and installation have been around since the 1960s which typically feature human figures in creative ways. Although these reefs are beautiful and serve as habitat for certain species they were not designed especially for the purpose of increasing species diversity and abundance. Those artistic artificial reefs are only beneficial to certain species, as they are usually lacking in rugosity, or complexity, and therefore do not provide a multitude of microhabitats that living reefs provide.

Successful Examples

In 1986, the Virginia gallery in New York launched EarthWorks as a groundbreaking exhibit that started the idea of art built from the natural environment. Although beautiful these sculptures had yet to develop a environmentally conscience objective. Today, successfully artists like Jason deCaires Taylor has a global network of exhibits including an entire underwater museum that already draw visitors from all around the world. These sculptures typically represent humans doing everyday tasks, mundane scenes, or in a transcendent manner. These statues do provide the basic attributes of an artificial reef but visually almost seem out of place in this submerged environment, and also have nothing to do with their environment. These artists have set the stage for conservation and awareness through environmentally inspired pieces, but we aim to take the idea two steps further.

Our instillations would highlight the species localized to these areas both aquatically and terrestrially. We would not limit ourselves to merely underwater as not everyone can enjoy. For underwater reefs we would like to create a duplicate for the nearby areas for the non-divers. For people who are not already interested or invested in the ocean, such as divers, spreading the awareness of a local rare species may guide those people in a conservation direction. Terrestrial installations can also lead to the education of the public on local rare or threatened species. Outdoor recreation areas can also benefit from these artistic installations and cab beco0me their own destination while continuing to educate. Creating a memorable event for people, and one they can share visually with their friends and family, might spark a deeper appreciation for the natural environment and drive the desire to protect it. Small acts like picking up trash or cleaning up thoroughly after themselves, can lead to major changes in the future. The goal is to inspire people to be aware of the problem in their everyday lives, and they may work harder to help.

Design Improvements

More complex reefs that aim to increase the biodiversity of that reef and maximize the types of species that can inhabit and utilize the reef. Featuring endemic and rare species we also aim to highlight the natural populations in an attempt to create not only awareness, but also a fondness for these species, which might lead to more of an effort by people to aid in their conservation.

Unlike some poorly designed artificial reefs that attract can fisherman, use unnatural/hazardous materials, and can cause environmental harm-- our small artistic reefs will not negatively affect the surrounding areas, nor alter natural habitats or community compositions significantly. Similar small artificial reefs that were introduced to sandy bottom habitats in San Diego were shown to have little to no effect on the benthic substrate around them and would not impact wave action, sand ripple patterns, or grain size of the sediment present (Davis et al 1982). Similarly, the population of the organisms in the surrounding areas were not shown to change outside of a small diameter around the reef. These small reefs would mainly be used as attractive spots for divers, an educative tool, and a model for designing and implementing larger successful reefs for rebuilding larger areas, but themselves will not affect the area enough to have any of the deleterious side effects some artificial reefs can have.

Scientific Benefits

An online scientific database will also be created to establish population estimates, growth rate data, and general ecosystem analytics based on visitor observation. When the exhibit is visited, the divers can then upload their photos and videos to the website to assist scientists on their research. Scientists can monitor the ecosystem, get population estimates, and monitor growth rates of the species present. Regular divers would have the opportunity to navigate to the reef, using it as a landmark and a learning tool. They will also be able to participate in the citizen science project while highlighting the local species that is only found in these few locations. Allowing the number of regularly conducted reef surveys greatly contribute to the successful assessment of each type of specifically designed artificial reef. This can lead to publication on the findings, and hopefully progress the knowledge of what constitutes a success artificial reef and how these tools can be implemented in the future.

For the terrestrial projects, we can still implement the citizen scientist database and collect data, but the data would be focused more on individual identification and population estimates. With these installations we are focusing on the everyday person looking for entertainment, which we will then educate them and have them in turn spread the word via social media and influence others to come and experience the exhibit.

Social Media Exposure

The vastly popular social media driven lifestyle of most people these days gives us an excellent opportunity for free advertising and wide spread exposure. Tik Tock, Instagram and Facebook are just some of the social media platforms that are always looking for new and exciting content. Influences are known to sway millions of followers and our art hope to inspire them to do the same through conservation art. Providing these visitors with a beautiful and extremely unique piece of art that highlights a local species, while providing breathtaking visuals gives social media posts more depth than merely a pretty picture. Photos and videos will then get posted and shared across the planet for all to see with ease. This is an excellent way of spreading the word to a global audience about these uncommon organisms, the health of our environments, and the potential threats humans pose to it. Our hope is that this will foster a sense of care and understanding and potentially draw in even more visitors. Using this unique type of platform to reach such a broad audience is crucial in the global change we are trying to inspire.

Monetary Benefits

The establishment of this new habitat will create numerous benefits such both ecologically and economically. The ecological benefits are already well known, but the monument itself can be used to create revenue for each city the installations are located. Charging for parking or admittance can increase the revenue at these locations, as visitors are already utilizing these areas and their numbers would only increase with the new attraction. The local businesses could also get the additional revenue due to the influx of visitors, which would could lead them to a greater appreciation for this rare species found right in their own neighborhoods. Spreading this awareness in the areas that are home to these rare species might bring a local sense of pride to the city, and create a greater desire to protect these areas.