

Cradle

Conservation • Education • Experience

"Sea turtle incubators that are both sustainable and educational"

Cradle is an innovative incubator for turtle eggs, featuring a thermostatic system to mimic natural nests, regulate sea ratios, and support healthy reproduction. Its nature-inspired design ensures safety and aligns with sea turtles' instincts. By integrating interactive education and sustainable tourism, Cradle fosters public awareness of marine conservation and inspires action to protect marine ecology.



Project Type

Individual Project

Tools



Date

October 2024 - December 2024

Conservation

Experience

Education

Background Research



Climate Change and Anthropogenic Destruction affect Sea Turtle Populations

With global warming intensifying and plastic pollution worsening, sea turtles face unprecedented survival challenges. Illegal fishing and egg poaching have further endangered their populations. Notably, incubation temperatures affect their sex ratio, creating a severe imbalance that threatens the species' future.



Climate Warming is causing a serious Imbalance in the Sex Ratio of Sea Turtle

The sex of sea turtles will be affected by temperature, because of the relationship between climate warming, so that the sex ratio of sea turtles is seriously imbalanced, according to a research report in Australia, the sex of newborn sea turtles is currently 99%, in addition, according to Australia's sex statistics on green turtles near the Great Barrier Reef, the ratio of male sea turtles to female sea turtles is 1:116, if it continues to deteriorate, it may affect the reproduction of the population, affecting the number of sea turtles in the world.



Illegal Poaching and Capture still Exist

Turtle eggs are considered a source of protein and are still available in local markets and restaurants, both raw and salted, in Southeast Asia. For example, in El Nido, Palawan, the Philippines, local residents dig up turtle eggs for food and sell in order to make a living, which has a serious impact on the ecology of sea turtles. In order to reduce poaching, local conservationists will buy turtle eggs from residents at high prices and carry out artificial hatching and conservation.

Design Concept

How to make the problem of sea turtles pay attention to the public and improve the current situation?

Create a Turtle-Friendly Birth Environment

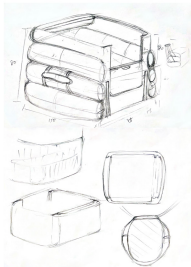
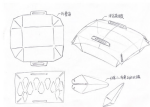
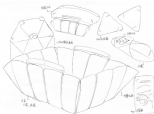
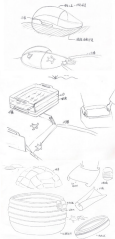
In order to create a friendly environment for sea turtles, a stable hatchery should be set up and the sandy soil temperature should be controlled to maintain a temperature of about 29°C to ensure a balanced sex ratio. Through the intelligent sensor system, the temperature is monitored and adjusted in real time to avoid too high or too low temperature affecting the incubation. Artificial hatcheries provide precise control of sand and environmental conditions to provide the safe place turtles need. In addition, choosing the right beach to lay eggs and continuously monitoring the change of sex ratio can effectively improve the reproductive success rate of sea turtles and protect the diversity of sea turtle species.



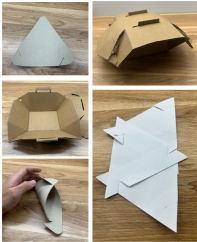
ESG Sustainable Tourism

ESG sustainable tourism emphasizes environmental protection, social responsibility and good governance. Practicing environmental sustainability through low-carbon transportation, waste reduction accommodation and nature conservation; Supporting local communities, respecting culture and promoting the common good of society; and ensure the transparent management and ethical management of tourism enterprises. This model not only reduces negative impacts, but also ensures that future generations can continue to enjoy a responsible travel experience. In addition, this tourism model can also achieve the effect of education, so that the public can truly feel the power of nature, and pay attention to the issue of nature conservation.

Sketch



Rough Model



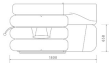
3D Modeling



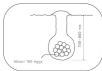
Function Description



Three Views



Simulated Turtle Egg Hole Depth



Unit: mm



Function Description

It can stabilize the temperature in the incubator and also create a light difference in the incubator to guide the baby turtles to move.

Top Blackout Heat Shield



The turtles will be released into the wild for a fixed period of time, and different echelons will be able to participate.

Wild Release Box



Interactive Record Board

The storage box contains a recorder that allows the public to adopt turtles while releasing them in the wild, and identify them by their unique facial shells.

The public can take the recorder home, and the public can interact with the turtles in the recorder, and can also watch the location of the same group of turtles, and remind the participants whether the turtles released in the wild at that time have migrated to lay eggs.



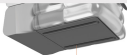
Infrared Lenses

The box is equipped with an infrared camera, which can provide local primary school students with remote observation of sea turtle hatching, so that this conservation activity can become a special curriculum content of the national primary school.



Air Cushion Wall

The air cushion wall makes it easier to control the temperature of the space, makes it easier to carry the incubator when it comes into contact with water, and the transparency allows the public to observe the hatching process of baby turtles.



Sled

Hatchery are equipped with sleds under the incubators, making it easier for conservationists to move the boxes in the sand.



The incubator mimics the natural turtle egg burrow to allow the turtle to hatch more naturally.