Symbiotic Beachfront Design: Sharing Southeast Florida’s Coast with Sea Turtles

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**Site Location:** Boca Raton, West Palm Beach County, Florida

Nearly every species of marine turtles can be found on the ever-increasing endangered species list. This urban beachfront design project focuses on the rapidly growing Southeast Florida Coast in Boca Raton. By implementing beach dune rejuvenation and interaction, a symbiotic habitat will grow on the Boca beachfront that creates awareness about sea turtles and a better chance for their essential revival.

**Artificial Lighting**

Artificial lighting is very detrimental for sea turtles, because they instinctually nest at night. Not only does it deter females from nesting successfully, hatchlings will crawl toward the brightest horizon, which naturally would be the ocean, however because of artificial light they crawl in the opposite direction often never reaching the ocean. Natural light is the light that occurs naturally at sea turtle nesting beaches. Sea turtle friendly lighting is available and can be applied to residential areas and commercial properties. Red lights are used to deter females from nesting and white lights are used to deter hatchlings from crawling out of the nest. Since these lights are turned off during the day, they do not detract from the environment and still provide light for human use.

**Endangered Species:** Chelonia mydas

- **Green Turtle**
  - 40-50,000 known nesting females living today.
  - Shell length is 3-4 feet long, pale/dark green or yellow color, and weighs 240-420 pounds.
  - Nests in Boca Raton June-August.

**Critically Endangered Species:** Dermochelys coriacea

- **Loggerhead Turtle**
  - 375 pounds.
  - Shell length is 2.5 to 3.5 feet long, reddish brown in color, and can weigh up to 3,000 pounds.
  - Nests in Boca Raton April-October.

**Threatened Species:** Chelonia mydas

- **Hawksbill Turtle**
  - 100-170 feet, from water to current dune vegetation and the site has a total of .60 miles along the beach.
  - The beach width varies from 100-200 feet from water to current dune vegetation and the site has a total of .60 miles along the beach.
  - Nearly every species of marine turtles can be found on the ever increasing endangered species list.
  - The turtles do not use all of the beach in fact they will crawl 40-60 feet from the high water mark for nesting and then return to the ocean to mate and feed.
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**Zoning**

- **Green** for park use
- **Orange** medium-high residential
- **Red** high density residential
- **Blue** coastal beach

**High Energy Beach Profile**

- Beach profile is difficult to maintain due to beach erosion and high energy winds that greatly influence the condition of the beach. Due to human use, the groomed beach profile is much flatter. This is because of loss of dune vegetation which traps sand that blows toward the shore, as well as beach grooming which helps keep the sand flat. This is especially true on the ocean side of Ocean Boulevard and on the beach; through the project area occurs on the inland side of Ocean Boulevard and on the beach; within the city of Boca Raton, it provides parking at South Inlet Park.

**Category 3 Storm Surge**

- Category 3 storm surge is up to 15 feet above the high water mark for nesting and then return to the ocean to mate and feed.
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Master Plan

Program Elements

Urban dune rejuvenation creates an exciting unique experience.

New beach spaces will help people circulate around the nesting habitat to find a more comfortable area to enjoy the beach.

Using turtle friendly lighting throughout the site will create a safer and sexier beach environment at night; for humans and most importantly for the sea turtles.

Natural approach to storm protection and lower maintenance as dunes will naturally grow and strengthen over time.

The turtle rehabilitation center and turtle sculptural elements give people the opportunity to physically interact with these wild, sparsely fogged animals, as well as be involved in the process of returning injured or endangered turtles back to the Atlantic Ocean.

“Turtle Plaza”

“Dune Experience”

“Turtle Plaza”

Sea Turtle Rehabilitation Center

Sea Turtle Rehabilitation Center

Overhead Shade Structure

Copper Turtle Sculpture

Beach Shower

Condo Tower

Performance Stage/
Beach Overlook

Condo Tower

Sculpture/Water Feature

Aquatic Exhibits

Observation Tower

Interactive/Educational Dunes

Beach Chairs

Street/Beach Access

Pedestrian Circulation Path

“Dune Room”

“Turtle Plaza”

“Dune Room”

Overlook/Node Space

“Dune Room”

Educational Experience

Atlantic Ocean
The plaza space features native Southeast Florida plants resistant to hurricane force winds, salt and flooding. The center plaza softscape is a native substitute to turf grass, and even provides a flowering aesthetic. These plant materials will help decrease maintenance costs, especially during a tropical storm event. The Plaza is a major node along the site, providing access to the street and the beach.

The plaza space has sea turtle friendly lighting such as indirect light as seen under the benches, and on the shore side of the palm trees. The blue lighting is solar activated, inlayed when the paving pattern was layed.
“Dune Room”

This intimate space is intended to be a place of observation, awareness, and education. The space is nestled within the dunes; inspired by the egg chambers that female turtles lay each year, becoming a quiet zone of self-reflection and thought.
The dune experience and turtle rehabilitation center is the main access for the public onto the beach in this area and will inspire sea turtle awareness and conservation. It will also give people the opportunity to become involved, whether it’s a night nesting tour or live hatchling exhibit.