

PROTECTING OUR DUNES

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In 1999, when my wife Deb and I first stepped onto North Beach, we were struck by the vista of a wide, uncrowded beach bordered by a spectacular dune line. Having studied oceanography, I knew that a robust dune line was indicative of a healthy barrier island system. Sand dunes form a natural barrier that protect the island from damaging winds and storm surge. Dunes also serve as a cache of sand for sustaining the beach during periods of erosion. Many of the dunes I observed in 1999 have since been destroyed by storm-related erosion.

Sand Dune Development

Sand dunes originate as windblown sand that accumulates around an object such as a clump of seaweed, or grass, or a discarded shell. These objects partially block airflow, reducing the wind's capacity to carry sand. This allows some of the airborne sand to drop out and be deposited. The accumulating sand starts to develop into a dune. Over time, native vegetation colonizes the growing sand dune. The roots of this vegetation act to stabilize the sand and hold the dune together.

Wheel, foot, and paw traffic on a sand dune can trample the vegetation and crush the delicate root systems. This matrix of root systems is essential to hold the sand together and prevent wind and water erosion.

Dune development occurs primarily during the spring and early summer months. During this period, conditions are conducive for plant growth on the dunes and beach erosion is minimal. Also, the heat of summer increases the evaporative rate of swash (i.e., water that washes up on the beach), resulting in waterborne sand settling on the beach. Some of this sand then becomes windborne and contributes to dune growth. Sand dunes are not static. They migrate landward or seaward or, as evidenced on North Beach, disappear. It all depends on the relative rates of sand deposition and erosion.

Sand Dune Environmental Benefits:

The sand dunes of Seabrook Island provide a multitude of environmental benefits including:

- **Island Protection:** Sand dunes act as a natural barrier against the erosive forces of wind, surf, and storm surge. This protects private property and infrastructure on the island.
- **Beach Stabilization:** Sand dunes provide a cache of sand which is available for restoring the beach after periods of erosion.
- **Wildlife Habitat:** Sand dunes provide a habitat for multiple plant and animal species. Salt tolerant vegetation offer food and shelter to wildlife, including insects, reptiles, crustaceans, and small mammals. Sand dunes provide nesting habitat for shorebirds and turtles. The diverse range of plants and animals which inhabit Seabrook Island's dune ecosystem contribute to the island's biodiversity.
- **Water Quality Improvement:** Sand dunes filter out pollutants from rainwater and surface runoff before the water enters the ocean.
- **Climate Change Resilience:** Sand dunes mitigate the effects of a warming climate by serving as a buffer against sea level rise and increasingly stronger tropical storms.
- **Aesthetic Value:** Sand dunes enhance the beauty of the beach vista and contribute to the quality of life enjoyed on Seabrook Island.

It is essential to conserve Seabrook Island's sand dunes. As individuals, how can we contribute to this conservation effort?

Simple.

Stay off the sand dunes!



Washed out dunes on Seabrook Island's North Beach (Oct. 2022)