

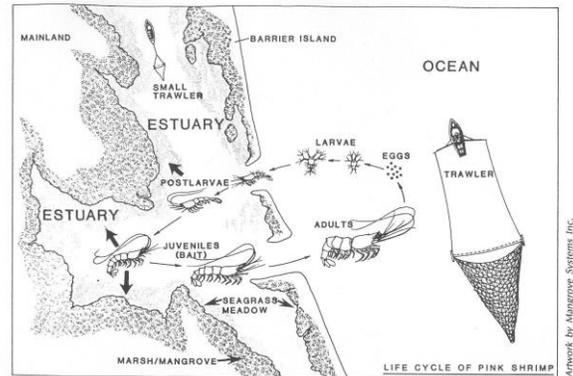
# Estuary 101

## What are estuaries?

Estuaries are semi-enclosed areas where freshwater from the land mixes with saltwater from ocean, creating brackish water. There are many types of estuaries, bays, sounds, inlets, harbors, lagoons -- what's important to remember is the mixing of fresh and saltwater. Our estuary, or tidal swamp, here at Barefoot receives freshwater primarily from the Cocohatchee River and saltwater from the Gulf of Mexico.

## Why are estuaries special?

“The cradle of the ocean” is a most appropriate title for estuaries. According to the Florida Fish and Wildlife Conservation Commission (FWC), more than 90% of Florida's recreationally and commercially important fishes, crustaceans, and shellfish spend periods of their lives in estuaries, usually when they are young. Many fish and crustaceans migrate offshore to spawn or breed. As the immature forms develop they are transported into the estuaries by tides and currents where they find protection from larger predators. Some species grow in estuaries for a short time; others remain there for life.



Estuaries are among the most productive ecosystems in nature, producing more food per acre than the richest Midwestern farmland. Rivers and streams drain into estuaries, bringing in nutrients from uplands. Plants use these nutrients, along with the sun's energy, to manufacture food. Among the most important plant forms are microscopic algae called phytoplankton. Other important plant forms, especially here at Barefoot, include mangroves and macroalgae. As larger plants die, or leaves fall off, they are broken down into detritus and colonized by microbes (bacteria, fungi, and other organisms). During decomposition, detritus becomes smaller and smaller and the nutrients and smaller particles become food for thousands of organisms. Larger animals feed directly on these tiny particles or on smaller animals that fed on detritus. In addition, estuaries provide breeding and nesting areas, or rookeries, for many coastal birds, including several endangered, threatened or species of special concern, such as osprey and brown pelicans. Estuaries role as nurseries cannot be overemphasized.

Estuaries and their surrounding wetlands also filter out sediments and pollutants from rivers and streams before they flow into the oceans -- providing cleaner waters for marine life.

Further, estuaries with their mangrove forest act as buffer zones. They stabilize shorelines and protect coastal areas from floods and storm surges. When a hurricane strikes, estuaries often absorb water from the storm before it can reach upland areas.

## What is the economic impact of estuaries?

- 45% of the population of the United States lives in estuarine areas
- 31% of the U.S.' gross national product is produced in coastal counties
- 28 million jobs in the U.S. rely on estuaries and other coastal waters
- The economic value of commercial fisheries supported by estuaries is at least \$19 billion annually
- 75% of the U.S.' commercial catch depends on estuarine and coastal wetlands
- 96% of the Southeastern U.S.' commercial catch depends on estuaries
- 50% of the Southeastern U.S.' recreational catch depends on estuarine and coastal wetlands
- 75% of **Florida's** game fish depend on mangroves
- 90% of **Florida's** commercial fish species depend on mangroves
- Rebuilding U.S. fisheries has the potential to add 1.3 billion dollars to the U.S. economy and create tens of thousands of family wage jobs

## PLANT COMMUNITIES

Established in 1990, Barefoot Beach Preserve is one of the few remaining stretches of an undeveloped portion of a barrier island on the southwest coast of Florida. Barefoot Beach Preserve has 186 acres owned by Collier County and 156 acres owned by the state of Florida, for a total of 342 acres managed by the department of Collier County Parks and Recreation. Barefoot Beach Preserve is on Little Hickory Island—a barrier island, an island in motion, made of sand and shaped by the wind, tides, waves, and currents. This narrow strip of land acts as a barrier, protecting the mainland from coastal storm wind and water. There are over 150 documented species of plants in the five distinct plant communities at Barefoot Beach Preserve:

- 1) **Pioneer zone:** The wave-deposited upper beach area is sparsely populated with pioneer species. This pioneer zone is created from sand piled up by the winds and waves. This area helps protect our fragile island while providing important habitat for many shorebirds and other creatures. Plants in this area must tolerate high concentrations of salt air, salt water over-wash, and strong winds. Here you will find vegetation such as railroad vine, inkberry, seaoats, seashore dropseed, and sandspurs.
- 2) **Foredune:** East of the pioneer zone starts the foredune community where you find low bushes emerging such as beach creeper and beach ambrosia; vines like bay bean; and the start of sea grapes. Seaoats form distinctive clusters or a band along the upper portion of the foredune. Plants in this area must tolerate high concentrations of salt air and winds.
- 3) **Coastal Strand:** Behind the foredune lies the coastal strand, a shrub community that includes plants such as lantana, prickly pear cactus, necklace pod, and sea grapes. The sandy, well-drained soils provide an ideal habitat for the protected Gopher tortoise. Plants in this area must be drought tolerant, like to live in sandy areas with little nutrition in the soil, and tolerate some salt air and winds.
- 4) **Maritime Hammock:** The most diverse vegetative community in the Preserve is the maritime hammock, located in the zone between the coastal strand and the tidal swamp. Here you will find plants such as sabal palms, gumbo limbo, myrsine, snowberry, Florida privet, and a continuation of sea grapes. You will also see vines such as poison ivy and greenbrier and air plants like ball moss. Plants in this area must be drought tolerant and like sandy soils with little nutrition. They may be somewhat tolerate of some salt air, however, are protected from much of the salt air by the coastal strand.
- 5) **Tidal Swamp (Estuarine Mangrove Forest):** Separating this barrier island from the mainland is the tidal swamp/estuarine mangrove forest. Estuaries, where fresh and salt water meet and mix, are some of the most productive communities on earth—called “Cradle of the Sea.” The tidal swamp is a basin forest, dominated by three species of mangroves: red mangrove, black mangrove, and white mangrove. Due to the tidal fluctuations, plants found here must have a high tolerance of salt water. This community is the dominant vegetation in the eastern two thirds of the Preserve.

