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The Salt Marsh Ecosystem

Salt marshes are transitional areas between land and water, occurring along the intertidal shore of estuaries and sounds where salinity ranges from near ocean strength to near fresh in up-river marshes. They are among the most productive ecosystems on earth. This is partly due to the daily tidal surges that bring in nutrients, the natural chemical activity of salty (or brackish) water, the tendency of nutrients to settle in roots of the plants there, and the tendency of algae to bloom in the shallow unshaded water.



ATLANTIC CITY AQUARIUM



Fish Tales

What Lives in the Salt Marsh?

There is not a great diversity of plant species in a salt marsh because these species must be tolerant of salty conditions. The most common species are glassworts and cord grasses. Other plants that are found in the salt marsh include plantains, sea lavenders, rushes, spartina, and sedges, which often establish themselves after the glasswort and cord grasses.

Fish, crabs, and shrimps live in salt marshes where the stems, leaves, and roots from the marsh plants

provide food and shelter from predators. The young of many species also use the salt marsh as a nursery. Because of a wealth of food and the protection given by marsh plants, younger animals are better able to survive to adulthood. Many of the fish that live in the marshes move on and off the marsh surface with the tide. Once they leave the safety of the marsh to go into the adjacent tidal creek, they become more vulnerable to the large predators living in creeks.

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A Black Skimmer searches for food.

Life in the Salt Marsh (continued from pg. 1)

Some marsh-dwelling fish and shrimps, such as the mummichog and grass shrimp, remain on the marsh surface after the tide recedes. They live in holes and standing pools of water.

Large numbers of more sizable invertebrates also inhabit salt marshes. Rapid changes in salinity, temperature, and exposure create stressful conditions for salt marsh inhabitants. These changes limit how many species occur in this habitat. Fiddler crabs, marsh snails and marsh mussels are typical invertebrate species which

live in salt marshes. The popular and highly prized oyster generally borders salt marshes. Fiddler crabs (below) and marsh snails shred dead plant material during feeding, aiding the decomposition process.



Marsh plants not only provide shelter, but also food, for a great variety of species, though not when these plants are alive. The decay-

ing plants break down into small pieces, called detritus, and provide a place for microscopic organisms such as bacteria, fungi and small algae to colonize. These organisms target bits of plant material that are not digestible by animals, and they break it down, to the benefit of the entire salt marsh community. Microscopic animals associated with detritus also cover the surface of mud in the salt marsh. They help stabilize and enrich the sediments, and are food for larger organisms.

Insects are also plentiful in the salt marsh. Most of these salt marsh invertebrates consume living plants or fluids produced by the plants. Some insects also feed on the detritus. However, the importance of the insects as grazers and detritus feeders in the salt marsh food web is small compared to their importance to the many species of birds that depend on them for food. The undigested grass eaten by insects is deposited as feces on the marsh surface where it becomes part of the food web. Many fish species also rely on insects of the salt marsh for food during part of the year.

A Teneral dragonfly rests after emerging. Soon, its exoskeleton will harden, and it will lose the iridescent sheen to its wings.



Birds of the Marsh

The salt marshes provide an excellent habitat for birds, with many places for feeding, reproducing and roosting. Species such as the red-winged black bird (below) alternately eat insects and seeds depending on the season. Other birds, such



as herons and egrets (far right), feed on fishes, shrimps and fiddler crabs. These birds are year-round residents of the marsh and frequently perch on mud banks watching for prey in tidal pools.

Species such as the Northern Harrier (right) and the Osprey (top, right) are also common to salt marshes. Marshes are also

important stopping-places for migrating birds as well. Every autumn and spring, thousands of ducks and geese find temporary refuge during their travels.

Birds also contribute important nutrients to the salt marshes through their feces, which accumulate in large quantities around nesting colonies. In turn, feces fertilize marsh grass, an important function in the marsh food web.



The Diamondback Terrapin

Diamondback terrapins, whose range is along the Atlantic and Gulf coasts, from Cape Cod to Texas, are probably the most common reptile in the salt marsh. They are believed to be the only turtle in the world that lives exclusively in brackish-water areas.

The diamondback terrapin's shell is covered with scales or

plates called *scutes* that have diamond-shaped growth rings. The top shell is light brown, gray, or black, and the bottom varies from yellow to olive. Shell sizes differ between male and female, with the male averaging five inches in length, while the female averages seven to eight inches. Black spots and marks, in a pattern unique to each turtle, appear on

the reptile's whitish skin.

Being one of the few reptiles that call the salt marsh home, they prey on clams, snails, crabs and some marsh plants.



Adaptations to the Salt Marsh

Nearly half of New Jersey's 245,000 acres of salt marsh is found along the coastlines of Cape May and Atlantic counties. Though many species in the salt marsh are not permanent residents due to the extreme environmental fluctuations found here, some have developed special adaptations in order to survive. The salt marsh plants that are found here have adapted to life in the marsh where they have their roots submerged twice daily in the salty water, and then exposed to the full drying effects of the sun. An example is Cord Grass which has special glands that allow it to secrete excess salt.

Other organisms that have special adaptations that help them adjust to the varying amounts of salinity and changes in water levels that occur in this habitat include some species of crab that have gills that can act as a lung allowing them to live both in and out of the water. Other small insects merely move according to the tides, and climb onto higher vegetation when the water level rises.



Key Vocabulary

Brackish – water that is somewhat salty, especially from being a mixture of fresh and salt water

Detritus - organic debris formed by the decomposition of plants or animals

Estuaries - a partially enclosed body of water formed where freshwater from rivers and streams flows into the ocean, mixing with the salty sea water.

Intertidal—occurring between the high-tide and low-tide marks

Invertebrate—animals without backbones

Salinity – salt content

Scutes— a bony plate or scale found on some reptiles

Internet Resources

http://www.nps.gov/history/history/online_books/nj3/contents.htm— From Marsh to Farm— The Landscape Transformation of Coastal New Jersey

<http://www.cumauriceriver.org/downjersey/agri/a-lesson3.html>—Down Jersey Lesson Plan regarding salt hay