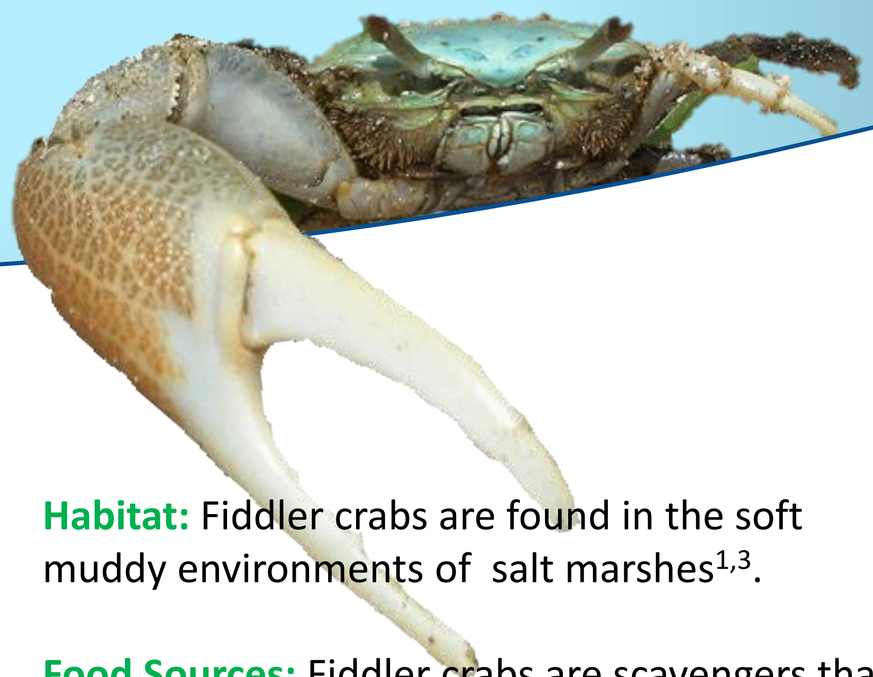
Fiddler Crabs

Uca spp.



Habitat: Fiddler crabs are found in the soft muddy environments of salt marshes[1,3].

Food Sources: Fiddler crabs are scavengers that pick through the mud for small worms, bacteria, fungi, dead animals and plant matter[1].

Behavior: They are land dwelling crabs that dig burrows below the surface of the sediment[1,3]. When high water, predators, or cold temperatures threaten them, they will hide in their burrows and block the opening with mud[1,3].

Cultural Common Name: Tou-lou-lou, which means crab in Cajun[2].

Where did they get that name? These crabs are named for the large claw (also called a cheliped) on the males[1]. During mating the male fiddler crab will wave his claw in the air to attract a female[1,3]. The motion the fiddler crab makes when eating looks like they are playing a fiddle, hence the name fiddler crab[1,4].

What happens if the crab loses a claw? Fiddler crabs have an amazing ability to regrow limbs; if a male loses its big claw, the small claw will grow and become the big claw and the newly grown claw will become the feeding claw[1,4]. Not all fiddler crabs have their large claw on the same side, just like with people, there are left-handed and right-handed fiddlers.

How do fiddler crabs grow? Fiddler crabs, just like other crabs, have exoskeletons[1,3]. They need to molt to grow and to regrow lost limbs[3]. During molting the crabs become very vulnerable to predation so they will remain in their burrows until their shells harden[5].

Did you know? Fiddlers are also an indicator of marsh diversity. When fiddler crabs burrow they mix the soil and expose deeper parts of the marsh to air[3]. This process is known as bioturbation, which brings nutrients and more oxygen to other plants and organisms making a more productive salt marsh[3].

Student Research at LUMCON:
Over the years students who have participated in LUMCON Estuarine Awareness and Discovery (LEAD) Camp and Field Marine Science Camp have been conducting ongoing research of fiddler crab burrows. Students are trying to understand the distribution, abundance, and length of burrows in high marsh versus low marsh areas. In the picture to the left, students are counting burrows in a 1x1 meter quadrat and casting burrows to measure length and shape.

Reference:
1. Texas Parks and Wildlife- tpwd.texas.gov
2. Integrated Taxonomic Information System- www.itis.gov
3. Smithsonian Marine Station at Fort Pierce- naturalhistory2.si.edu
4. Gulf Coast Research Laboratory- gcrl.usm.edu
5. Chesapeake Bay Program- www.chesapeakebay.net

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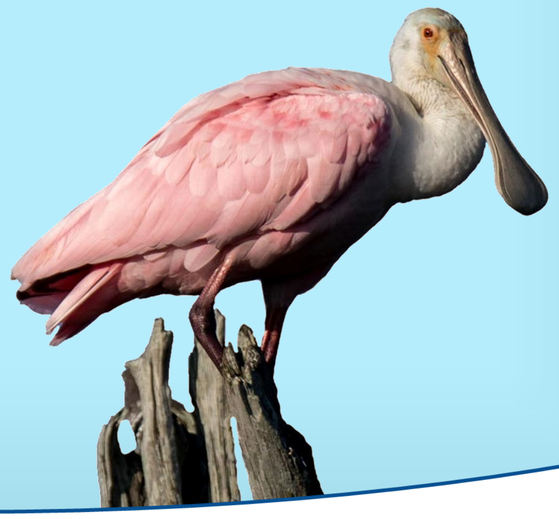
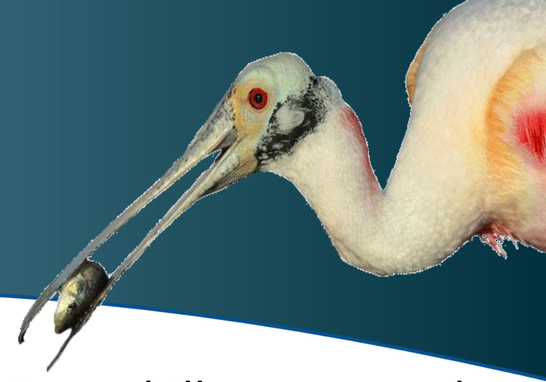
Roseate Spoonbill

Platalea ajaja





Habitat: The spoonbill is distributed throughout the Gulf Coast, Central America to South America, and the West Indies[1,3,4]. They can be found in coastal marshes, lagoons, mangrove forests, and estuaries[1,4].

Food Sources: Fish, shrimp, crabs, insects, mollusks, and crawfish[1,2,3,4].

Behavior: Spoonbills are wading birds and will forage through shallow waters[1,2,3,4]. They sway their specialized spoon shaped bills back and forth snatching up prey[1,2,3]. Females lay 2 to 5 eggs per breeding season (March-June)[1,2,3,4]. Both males and females will take turns incubating the eggs till the eggs hatch[1,3,4]. Parents feed their young by regurgitation for up to two months after hatching[4].

Photo: Smithsonian National Zoological Park

Photo: Joshua J. Cotton @jcotten

Photo: Cynthia Hansen/Audubon Photography Awards

Population Decline: Spoonbills were nearly hunted to extinction during the late 1800's and early 1900's[1,3]. This was caused by the demand for their exquisite pink feathers to be used in women's hat and fans[3]. However, the Migratory Bird Treaty Act of 1918 made the taking, killing, or possessing of migratory birds illegal[5]. Since then, populations have been able to recover, but habitat loss still threatens spoonbill populations[1,3].

Pink! Pink! Pink! Ever wonder how these birds get their beautiful pink coloration? It is caused by pigments called carotenoids that are found in algae[3]. These algae are eaten by the shrimp that spoonbills eat[2,3,4]. Once in the body of the spoonbills, the pigments give them that wonderful pink color[3]. This is also how flamingos get their pink color[3]!

Shall we dance? Roseate spoonbills have very unique courtship rituals. Courting spoonbills will present nesting materials, like sticks and twigs, to one another[1,4]. They also dance around each other, clap and intertwine their bills before mating[1,4].

References:

1. National Audubon Society- www.audubon.org
2. U.S. Fish & Wildlife Service- www.fws.gov
3. Texas Parks and Wildlife- tpwd.texas.gov
4. Smithsonian National Zoological Park- nationalzoo.si.edu
5. US Code- 16 U.S.C. 703 *et seq*.

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Top Right- Steven Scott
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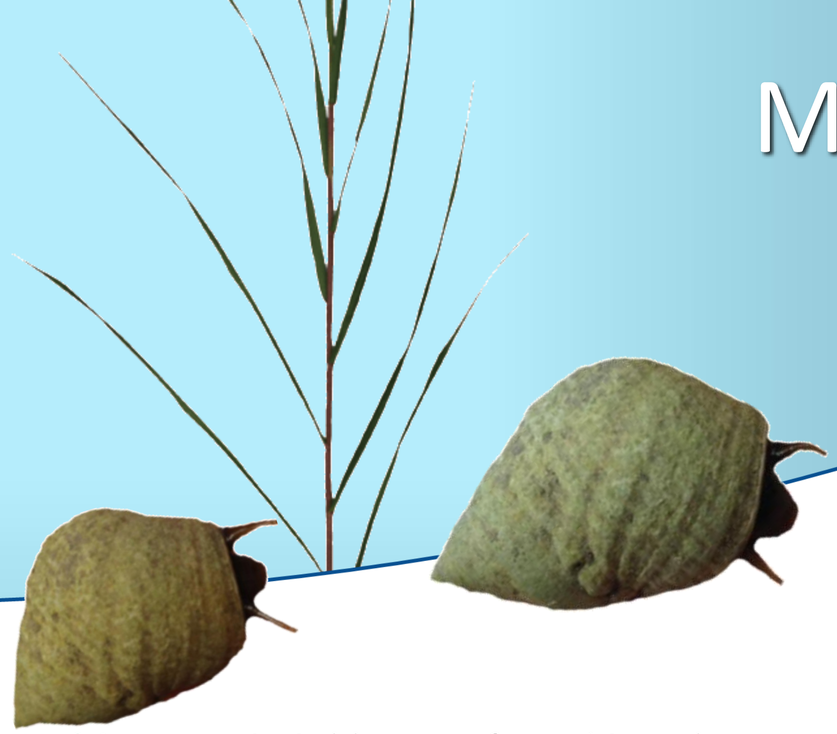
Marsh Periwinkle Snail

Littoraria irrorata



Habitat: Periwinkles are found in salt marshes and spend most of their time on the shoots of marsh smooth cordgrass (*Spartina alterniflora*)[1,2,3].

Food Sources: Mostly algae and dead plant material, but they also farm fungus for food[1,2,3].

Behavior: Periwinkles move up and down grass stems as the tides change; during low tides they will move down the stems to feed, when it is high tide the snails will climb up to the tops of the grass to keep away from predators like blue crabs and killifish[2,4].

Fun Facts: Periwinkle snails only grow to be about an inch long[1,2,3]. They avoid drying up by sealing themselves inside their shells[5]. These snails also secrete a mucous in order to hang on to the stalks of smooth cordgrass[3].

Photo: Coastal Waters Consortium

Photo: Coastal Waters Consortium

Photo: LUMCON

Periwinkles and the Marsh: Periwinkles are considered an indicator species in salt marsh ecology, which means scientists use them to help examine the health of marshes[1]. They are very sensitive to chemicals and pollutants like crude oil[6]. After oil spills periwinkle populations decline dramatically and then gradually recover as plants begin to re-grow[6]. This recovery may take months or even years[6].

Student Research at LUMCON: Students who have participated in LUMCON Estuarine Awareness and Discovery (LEAD) Camp and Field Marine Science Camp have been conducting periwinkle mark-recapture studies. The bottom picture shows students counting tagged (shown below) versus untagged snails in a quadrat along a transect. Students are trying to understand distribution, site fidelity, and population counts of these snails in LUMCON's marshes.

References:

1. Keith Walters and Loren Coen-- www.dnr.sc.gov
2. Chesapeake Bay Program-www.chesapeakebay.net
3. Smithsonian Marine Station at Fort Pierce- naturalhistory2.si.edu
4. Carroll et al. PeerJ. 2018; 6: e5744- www.ncbi.nlm.nih.gov
5. Iacarella & Helmuth. Journal of Thermal Biology. 2011- citeseerx.ist.psu.edu
6. Oil Spills in Marshes- response.restoration.noaa.gov

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Eastern Oyster and Atlantic Ribbed Mussel

(*Crassostrea virginica, Geukensia demissa)*

Habitat: Low tidal marshes and mudflats in brackish or salt water[1,2,3,4]. The ribbed mussels and eastern oysters range from Maine to Florida and the Gulf of Mexico[1,2,3,4].

Food Sources: They are filter feeders meaning they filter algae, plankton, and other particles of food out of the water through their gills[1,2,3,4].

Behavior: Oysters and mussels form dense groups[1,2,3]. Once their larvae settle, oysters cement themselves in place for life[3,4]. Mussels create threads to hold themselves in place, but can move and reattach if detached[1,2].

Water Quality: Since oysters and mussels are filter feeders they have the amazing capability to remove debris, toxins, and pollutants from the water, improving water quality[1,3,4]. Filtration rates can range between 20 to 50 gallons of water per day[2,3]!

Photo: Chesapeake Bay Program

Photo: Hannah Sarver

Photo: Coastal Waters Consortium

Building Habitats: Large groups of oysters act as reefs, providing habitat for crustaceans, fish, and invertebrates including other oysters[3,4]. When mussels attach themselves to the base of marsh plants and in sediments, they provide stability and nutrients to the plants, increasing marsh productivity[1].

Bivalves, nom, nom, nom: Louisiana produces the highest oyster landings in the nation[5]. Oysters have become more popular over the years, however they can accumulate dangerous levels of toxins[4,5]. While Atlantic ribbed mussels are edible, they are not as popular as the blue mussel[1]. Both can hold toxins and bacteria in their shell when closed during low tide and so should not be harvested then[3].

Student Research at LUMCON: Students who participated in LUMCON's Field Marine Science Camp conducted experiments to find out how filtration rates of the eastern oyster could be affected by exposure to oil. The results of this research are inconclusive.

References:

1. Animal Diversity Web- animaldiversity.org
2. Smithsonian Marine Station at Fort Pierce- naturalhistory2.si.edu
3. Chesapeake Bay Program- www.chesapeakebay.net
4. Texas Parks and Wildlife- tpwd.texas.gov
5. Gulf States Marine Fisheries Commission- www.gsmfc.org

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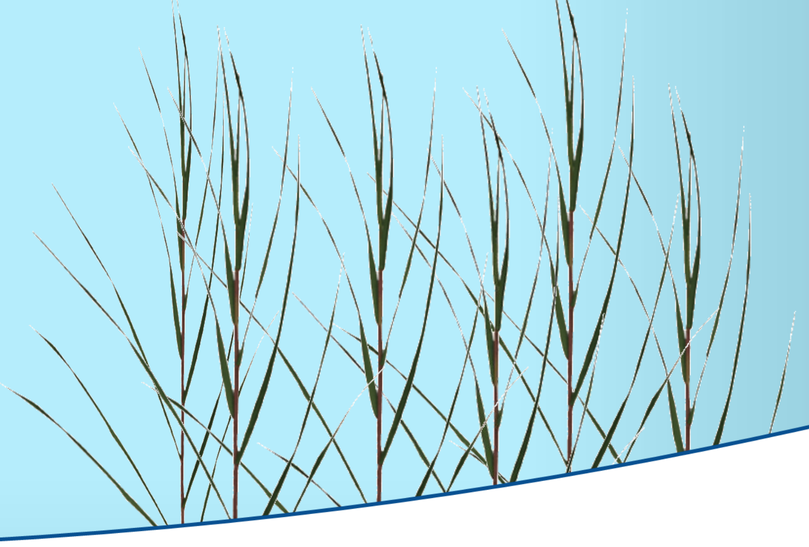
Smooth Cordgrass

Spartina alterniflora



Habitat: Commonly found in salt marshes, tidal flats, and on beaches[2,3]. It is widely distributed along the Atlantic coast from Nova Scotia to Florida and into the Gulf of Mexico from Florida to Texas, and along the Pacific coast from Washington to California[1,3].

Characteristics: It is a grass that can grow up to 7 feet tall in the low marsh and up to 3 feet in high marsh areas[3]. *S. alterinflora* is green in the spring and summer, then turns a yellowish light brown color in the fall and winter[3].

Salt, salt, salt! Salt marshes can be extremely harsh environments; daily exposure and flooding due to tides and drastic changes in salinity and temperature make it a challenge for most plants to survive. *S. alterniflora* is one of the few plants that can handle those extreme changes because it can remove salt from the water it absorbs and get rid of the salt through its leaves[2,4].

This photo shows one of our past LUMCON Estuarine Awareness and Discovery (LEAD) campers tasting the salt on a blade of *S. alterniflora.*

Primary Producers: Most plants convert sunlight into energy and food through photosynthesis. *S. alterniflora*, through the process of photosynthesis, supplies the atmosphere and soil with oxygen[3]. Cordgrass is at the base of the food chain, providing food for a variety of organisms and decomposing cordgrass creates rich organic material that is added to the marsh[2,3].

Hold it together! Not only is *S. alterniflora* a primary producer within the salt marsh but it also holds the entire marsh together! These plants have an extensive root system that traps and holds the soil that forms the marsh[1,2]. This also helps prevent erosion along the edges and creates a natural buffer from storms and tidal surges[1,2,3].

Interesting Fact: Smooth cordgrass not only provides habitat for many fishes, crustaceans, and bivalves but also birds[3]. In Louisiana millions of birds use salt marshes as stop-over sites while migrating from each year because *S. alterniflora* provides protection, shelter, and food[3,5].

References:
1. Natural Resource Conservation Service- plants.usda.gov
2. University of Rhode Island- www.edc.uri.edu
3. US Forest Service- www.fs.fed.us
4. University of Connecticut- nemo.uconn.edu
5. Coastal Wetlands Planning, Protection and Restoration Act- lacoast.gov

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Salt Marsh Bulrush

Bolboschoenus robustus

Habitat: Bulrush is found in coastal salt marshes and tidal flats ranging from Nova Scotia to Florida, the Gulf of Mexico, and also California[1,2].

Characteristics: Bulrush is green in color with a triangular stem (top photo) and one to five spikelet's that are clustered together near the top of the stem (center photo)[1,3]. The spikelet's are reddish-brown to straw-colored and contain brown seeds[1]. This plant can grow between 2.3 to 5 feet tall and flowers from April to August and fruits from July to October[1,2,3].

Role in the Marsh: Bulrush plays an important part in salt marsh ecology and diversity. Their seeds are a primary food source for muskrats, a variety of marsh birds, and waterfowl[1,2,3]. It also provides habitat and shelter for ducks and fiddler crabs[1].

Photo: University of Florida

Photo: University of Florida

Photo: University of Florida

Common Names: Names of plants can vary among regions. Bulrush is one plant that has many names, nine to be exact[1]! Those names are seacoast bulrush, alkali bulrush, bulrush, three-cornered rush, leafy three-cornered sedge, saltmarsh bulrush, seaside club-rush, stout bulrush, and sturdy bulrush[1].

Scientific vs Common Name: Even though this plant has many common names they all refer to the same plant. Scientists however, know it by using the scientific name which is understood universally. The formal naming system, called binomial nomenclature, names living things using two parts: genus and species. The scientific name of this particular plant is *Bolboschoenus robustus.*

Native Americans and Bulrush:
Not only does bulrush provide food and shelter for many plants and animals, it has traditionally been used by Native Americans; the tubers and shoots can be eaten while the stems can be used to make baskets, mats, and other materials[4].

References:
1. US Forest Service- www.fs.fed.us
2. Lady Bird Johnson Wild Flower Center, University of Texas at Austin- www.wildflower.org
3. Center for Aquatic and Invasive Plants, University of Florida- plants.ifas.ufl.edu
4. Native American Ethnobotany DB- http://naeb.brit.org

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Top- Peggy Romfh, www.wildflower.org