WETLANDS EDUCATION CENTER

Port Aransas, Texas

Docent Manual

UNIVERSITY OF TEXAS MARINE SCIENCE INSTITUTE

MISSION—ARANSAS NATIONAL ESTUARINE RESEARCH RESERVE

CONTENTS

INTRODUCTION

The Wetlands Education Center (WEC)

The Wetlands Education Center (WEC), a 3.6 acre salt marsh and sand dune complex located on the campus of the University of Texas Marine Science Institute (UTMSI), was established to help visitors learn about the ecological and economic importance of coastal wetlands. The WEC is part of the Mission-Aransas National Estuarine Research Reserve and its development was made possible through the effort and support of UTMSI, the United States Army Corps of Engineers, the National Oceanic and Atmospheric Administration, and private contributors.

The WEC hosts hundreds of visitors each week, including senior citizens, families, and K-12 school groups. It is open to the public seven days a week, including holidays. Guided tours of the WEC are offered by staff or docents at 10:00 a.m. each Tuesday, Thursday, and Saturday, but visitors may take a self-guided tour anytime they wish, using the interpretive panels that are stationed along the walkways. The walkways and boardwalks that wind around the salt marsh and through the sand dunes are all handicapped accessible.

Visitors can view sand dune and salt marsh vegetation and learn how they help provide food and habitat for wildlife, as well as anchor sediments to prevent erosion. Many of the plants and animals are identified on wayside panels, located at kiosks throughout the WEC. The bronze geodetic marker at the WEC entrance is part of the National Spatial Reference System. The WEC is a tool used to interpret for visitors why salt marshes and estuaries are among the most ecologically productive habitats on the planet and many of the ways the economy and ecology of the area can benefit from them.

Opportunities for WEC Docents

Dr. Rick Tinnin leading a tour of the WEC.

The WEC attracts thousands of visitors and school children each year and it is beyond the capability of the staff to provide tours and programs for all of them. WEC docents extend the educational outreach capabilities of the WEC and the Marine Education Services program at UTMSI and allow us to help many more visitors and students appreciate the importance of coastal wetlands. Besides leading public and K-12 school tours of the WEC, volunteers may also assist school children with hands-on marine science activities and help staff with special educational outreach events, such as the Celebration of Cranes in Port Aransas and Earth Day Bay Day in Corpus Christi.

Docent training consists of shadowing and assisting staff as they lead WEC tours and teach hands-on lessons to school groups. Docent training workshops are also offered periodically for volunteers who would like to gain more in-depth knowledge of WEC resources. A sample schedule of a docent training workshop is provided on page 15 of this manual.

Principles of Interpretation for WEC Tours

Freeman Tilden was among the first to apply a definition to the informal education or *interpretation* that occurs at parks, museums, monuments, zoos, aquaria, nature centers, and similar settings. Tilden defined interpretation as "An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information." In his book, "Interpreting Our Heritage," Tilden described principles that he considered essential for effective interpretation. A couple of Tilden's principles are given below and applied to interpretation at the Wetlands Education Center (WEC).

"Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile."

It is not so easy to relate the natural objects encountered at the WEC to the personality of a visitor, however, they are relevant to the experiences of most people. For example, when WEC tour guides discuss the ecological and economic importance of coastal wetlands, visitors learn that wetlands provide essential habitat for the crabs, shrimp, and oysters that people like to eat, that wetland plants anchor and protect the shorelines near or upon which people's homes are built, and that wetlands act as sponges to absorb excess water that might otherwise flood homes and businesses. But, these ecological and economic benefits are not merely *discussed* during a tour. The visitors actually *see* the oysters living in the salt marsh and the wetland plants anchoring the shorelines. While walking out onto the floating platforms in the middle of the marsh, the visitors are able to visualize how much storm-surge water the marsh could absorb, before the buildings at the University of Texas Marine Science Institute were in danger of washing away. Seeing these things with their own eyes helps the visitors to understand that wetlands are important, not only to the plants and animals that live in them, but to people like themselves, who live in coastal communities or rely on their resources.

"Information, as such, is not interpretation. … however, all interpretation includes information. … The chief aim of interpretation is not instruction, but provocation."

There are many ways that one might conduct a tour of the WEC. One way would be to lead visitors around the salt marsh, pointing out and naming the marsh plants and animals. This type of tour might satisfy a botany or zoology student with an upcoming practical exam, but many visitors would find such a tour meaningless. Most WEC visitors are interested in learning, but people generally learn little from exposure to a jumble of discrete facts. Many plant and animal names "learned" at an interpretive program are promptly forgotten. What people do tend to remember is the main idea or theme of a program, which is sometimes called the "take home message." The main theme of a WEC tour could be stated as, "Coastal wetlands are among the most ecologically and economically valuable habitats on Earth." It is a good idea to state the theme at the beginning of a tour because it helps visitors to find relevance in the

information that is presented during a tour.

Including factual information during a WEC tour is necessary and desirable, but it should not be the focus of a tour for the general public. A tour should include just enough factual information to support and reinforce the take home message. An interpretive tour should not be a venue for the interpreter to tell visitors everything he or she knows about a topic. It would not even be possible to do so in a 45-minute tour. It *is* possible for the interpreter to instill an appreciation of the ecological and economic importance of coastal wetlands and to provoke an interest in learning more about them. The best interpretive tours are built around a main theme, are supported by well documented facts, and always include direct contact with the resource being interpreted. A good interpreter's rule-of-thumb is "if you can't see it, don't talk about it." That is not to say that informal chatting about non-tour topics is off-limits. Informal talk is a good thing, as it helps to establish rapport with visitors, but interpreting the resource (i.e., coastal wetlands) should be the goal of a WEC tour.

An example WEC tour is included on the following pages to help prospective tour guides develop their own tour. Tips that may also prove helpful are given below for the tour introduction, body, and conclusion.

Tour Introduction

The purpose of the introduction is not only to introduce yourself and establish a rapport with your audience, but also to introduce the theme of the tour. To set an inviting and informal tone, it might be helpful to think of yourself as a host who is welcoming visitors to his or her home. You might ask the visitors where they are from and whether or not they have visited UTMSI or the Wetlands Education Center before. It is also a good idea to tell the visitors how long the tour usually takes (~45 minutes), warn them about any hazards to watch for, and encourage them to ask questions along the way.

Tour Body

Develop the tour theme by leading the visitors through the sand dune and salt marsh habitats and discussing the benefits that these habitats provide to wildlife and to people, such as themselves.

Tour Conclusion

Since the goal of the conclusion is to reinforce the theme of the tour, a great place to end is on the floating platform in the salt marsh. This location allows the tour guide to point out estuarine resources, such as oysters and marsh plants, and to reinforce their economic and ecological importance. Once the tour is complete, make sure to thank the visitors for attending and you may wish to tell them the Visitor Center and other areas of interest at UTMSI (see p. 14 for more information).

PROCEDURES

Wetlands Education Center Example Tour

Tour guides who are able to speak to visitors informally and in their own words are more stimulating and interesting than tour guides who memorize a scripted tour. Therefore, the following example tour is provided as a source of *information* for prospective tour guides, *not as a script*.

Introduction

The Wetlands Education Center (WEC) was established to help people appreciate the ecological and economic importance of coastal wetlands. The WEC is part of the Mission-Aransas National Estuarine Research Reserve, which is one of 28 National Estuarine Research Reserves, or "NERRs," in the United States. NERRs are formed as partnerships between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. They are established for long-term research, education, and stewardship and they help protect more than one million acres of coastal land and water, nationwide. As the name suggests, NERRs are associated with estuaries. Estuaries are areas where fresh water from rivers (and other sources) meets and mixes with salt water from the ocean and they are generally named for the rivers that flow into them.

The Mission-Aransas Estuary is named for the Mission and Aransas Rivers, the two main sources of fresh water for the estuary. The Mission-Aransas NERR consists of over 185,000 acres of state, federal, and private land. The University of Texas Marine Science Institute administers the Mission-Aransas NERR in partnership with several governmental agencies and private organizations, including NOAA, the Texas Parks and Wildlife Department, the United States Fish and Wildlife Service, and the privately-owned Fennessey Ranch.

Wayside panel showing a map of the Mission-Aransas NERR.

Mustang Island – Shifting Sands

The focal point of the Wetlands Education Center is a salt marsh. Salt marshes are commonly found along the irregular interior or bay shorelines of barrier islands, such as Mustang Island. Mustang Island, is so named because of the horses that were introduced onto the island by the early Spaniards.

Mustang Island is one of 7 barrier islands that began forming along the Texas coast about 8,000 to 5,000 years ago. The barrier islands reached their approximate modern form by at least 2,000 years ago. Barrier islands are essentially elongated sand piles. A barrier island is a long, relatively narrow island that runs parallel to the mainland. The barrier islands formed as long-shore currents deposited sands on sand bars and spits, creating a series of small sandy shoals, which elongated and became connected as more sands were deposited on and between them. Much of the sand that was reshaped to form the barrier islands was deposited on the continental shelf during the last Ice Age. At that time, much of the Earth's water was tied up in glaciers, so sea level was lower. Geologists estimate that the shoreline was about 50 to 80 miles further out than it is today, at the height of the last Ice Age. Rivers flowed onto the continental shelf, where they dumped their sediments and formed river deltas. When the earth warmed and the glaciers melted, the river deltas were submerged and their sands were rearranged to form the barrier islands.

Mustang Island is only about 18 miles long with an average width of about 2 miles, but Padre Island, just to the south of Mustang, is the longest barrier island in the world, at about 113 miles in length. To the north of us is San Jose Island, which you can see just across Aransas Pass.

Barrier islands are first in the path of storms that originate in the Gulf and head inland, so they help protect the mainland from tropical storms and hurricanes. That is great for the mainland, but the inhabitants of the barrier islands must rely on large, stable sand dunes for protection. Mature, stable sand dunes act as buffers against flooding and provide protection against storm surges.

Sand dunes form primarily on the Gulf side of barrier islands. Dunes are formed by the action of wind and waves, but the same forces that create dunes also destroy them. Sand is continually shifting due to wind and wave action, but sand dunes are stabilized by the vegetation that grows on them. It is amazing that plants are actually able to grow on such unstable sediments, however, when plants do take hold, they anchor the dunes with roots that reach deep in search of water and they trap additional sediments, creating even larger dune formations.

Sheltered Existence - Between the Dunes

Stabilized dunes provide shelter for many plants and animals, but because sand is very porous and does not retain soil moisture as well as smaller sized soil particles, such as silt and clay, the sand dune habitat tends to be very dry. Most of the plants that grow on or between the dunes have adaptations that enable them to survive in a dry environment. These adaptations are similar to those found in desert plants and they include the development of a thick, waxy cuticle on the surface of leaves, succulence or storing water in the leaves, stems or roots, and the development of plant hairs on the surface of leaves that absorb water from the air and retard water loss. These plants have different strategies for trapping ground water, which range from the development of a long sturdy taproot that grows deep in search of moisture to shallow, net-like roots that lie just below the surface and trap moisture.

Silverleaf sunflower (*Helianthus argophyllus*)

The leaves of the silverleaf sunflower are covered with soft white hairs. Not only do the plant hairs retard water loss, by shading the leaf surface and trapping moisture, but their light silvery color helps to deflect sunlight, so the leaf surface stays cooler. Silverleaf sunflowers are common in deep, sandy soils and they have a long taproot that helps anchor the dunes.

Railroad vine (*Ipomoea pes-caprae*)

The leaves of railroad vine are covered with a thick waxy cuticle that helps protect them from moisture loss. This vine is very effective in erosion control because roots form at numerous nodes along the stems and help hold the dunes in place. The stems may reach 75 ft. in length and can grow 10 inches per day, given adequate moisture.

Salt marshes tend to form on the bay side of barrier islands and on the fringes of estuaries. Salt marshes and other coastal wetlands are among the most important habitats on earth, but relatively few people know this.

Many people are aware that rainforests play an important role in absorbing atmospheric carbon dioxide and producing oxygen. Rainforests are sometimes called the "lungs" of the earth, but fewer people are aware that wetlands act as the world's kidneys.

Life in a Salt Marsh

Wetland plants, sediments, and shellfishes act as filters to clean and purify runoff water before it enters our groundwater or other water sources. Runoff from the land can contain many types of chemicals. Estuarine plants take in nitrogen and phosphorus, and use them as nutrients to support their growth and reproduction. Oysters filter particles out of the water as they feed. A single oyster can filter up to 1.3 gallons of water through its body in just one hour.

Besides acting as a natural water filter, salt marshes are feeding grounds for many types of wildlife. Many species of birds winter in Texas's coastal marshes, feeding on fishes, crustaceans, shellfishes, and small invertebrates that burrow in the marsh sediments. Geese and other birds eat the rhizomes of smooth cordgrass. The whooping crane is an endangered species that flies 2500 miles from the Wood Buffalo National Park in Canada to the Aransas National Wildlife Refuge, where it spends the winter feeding on blue crabs, crawfish, frogs, insects, and other marsh foods.

Salt marshes also serve as nursery grounds for fishes and other aquatic animals. Salt marshes provide juvenile fishes, shrimps and crabs with abundant food, allowing them to grow rapidly to adulthood, and vegetative cover, which allows them to hide from predators.

Salt marshes and coastal wetlands benefit people as well as wildlife. Many of the fishes, crustaceans and shellfishes that rely on salt marshes and other coastal wetlands as nursery grounds are the same species that we like to eat. In fact, the largest shrimp and blue crab fisheries in the United States are located in the Gulf of Mexico, due to the presence of numerous salt marshes and estuaries. The shrimp fishery is the most valuable fishery on the Texas coast, adding millions of dollars to the economy each year.

The vegetation associated with salt marshes helps stabilize shorelines and reduce erosion. Near-shore seagrass beds and shoreline plants baffle or slow down wind and waves, minimizing their ability to erode the shoreline. The dense rhizomes and roots of estuarine plants such as smooth cordgrass and saltgrass also reduce shoreline erosion by anchoring sediments in place. Salt marshes lessen the severity of floods by detaining and absorbing rain and flood waters.

Salt marshes also provide people a great venue for recreation. People have fished and hunted waterfowl in salt marshes for thousands of years, but more recently, bird and other wildlife watching have become very popular past-times in the United States.

The salt marsh environment is very productive but it can also be very harsh. Salt marsh plants and animals have developed adaptations that allow them to survive under very wet, salty and low oxygen conditions.

We tend to think of plants as being oxygen producers, but plants also consume oxygen during respiration, a process in which sugars are broken down to release energy for plant growth, maintenance and reproduction. However, water-logged marsh soils tend to be low in oxygen. Not only does saturation by water limit the oxygen available to plants, but when

plants die, the process of decay also uses oxygen, so marsh soils are often anaerobic or low in oxygen.

Plants have special cells in their leaves which allow them to absorb oxygen directly from the air. These plants could not survive if they were totally submerged in water, however, plants known as seagrasses can survive when completely submerged. Most of the plants around the edge of the marsh are true grasses. Seagrasses are not actually true grasses. They are flowering plants that can form large underwater beds, which provide food and habitat for many aquatic animals.

The black mangrove (*Avicennia germinans)* can absorb oxygen through cells in its leaves, but it also has special organs, called aerial roots or pneumatophores, that branch off of the underground roots and help the plant take in even more oxygen. Aerial roots are made up of spongy tissue that absorbs oxygen and transports it to the rest of the plant. ***Show aerial roots.*** Mangroves are known as pioneer plants of the salt marsh due to their ability to thrive under high salt and low oxygen conditions. We are on northern edge of the range of the black mangrove, because it cannot tolerate hard freezes. Black mangroves rarely exceed 6 ft. in Texas but can reach 30 ft. in warm Caribbean estuaries.

There is no source of fresh water other than rain entering this marsh, so the salinity in the marsh is about the same as that in the Pass. Most of the plants that you see growing in or on the edges of the salt marsh have salt glands on the surfaces of their leaves that excrete excess salt in the form of a very concentrated saline solution or brine. As the water evaporates it leaves salt crystals behind and if you look closely, you can actually see the salt crystals on the leaves. The crystals are later washed away by rain.

The tall grass, nearest to the water, is smooth cordgrass (*Spartina alterniflora*). Smooth cordgrass forms dense stands along the edges of salt marshes, primarily within the tide line. It has an extensive root system and thick, horizontal, underground stems called rhizomes, which anchor the shoreline and help prevent erosion. The seeds are used as food by marsh, shore and song birds and geese eat the rhizomes.

Just behind the smooth cordgrass is a line of shorter and darker-green grass called saltmeadow or marshhay cordgrass (*Spartina patens*). Saltmeadow cordgrass generally grows behind smooth cordgrass on the land side of salt marshes. It resembles a rush because the leaves are rolled inward. It is important for erosion control and as a food source for wildlife.

Animals also have adaptations that allow them to survive in very salty and low oxygen environments. Gulls, pelicans, herons, and other wading birds, waterfowl, and shorebirds are able to drink very salty water because they have salt glands that are located above their eyes and open into their nasal cavities to discharge salt. Grass shrimp climb up the stalks of marsh plants to expose their gills to air, when the oxygen levels fall too low in the salt marsh.

The Aransas Pass - Gateway to the World

Barrier islands are aptly named because they provide barriers to storm-surges, which serve to protect the mainland, but they also restrict ship traffic and the passage of marine life and water into our bays and estuaries. Natural passes form in barrier islands as currents wash sediments away, however, currents also carry sediments that fill in the passes, so passes have opened and closed throughout time. The Aransas Pass has migrated west from its original location, near the Lydia Ann Lighthouse, to its present location. About 100 years ago, large blocks of granite were quarried from the central Texas area, around Marble Falls, to build the jetties that stabilize the Aransas Pass. The Aransas Pass allow ships to pass through the barrier islands and access the Gulf Intracoastal Waterway and the Port of Corpus Christi, the sixth largest port in the United States in terms of tonnage shipped.

Not only does the pass allow ship traffic but it also provides a connection for water exchange between the Gulf and the bays, and for the passage of fishes, crustaceans and shellfishes that require both coastal and open water habitats at some point in their lives. The red drum, spotted seatrout, and southern flounder are important sport and food fishes and they all require access to both the open Gulf and coastal bays during their lifetimes. The Aransas Pass and other barrier island passes allow them to move between the bays and the Gulf.

Life on the Rocks

Before about 100 years ago, there were essentially no hard surface or rocky shore habitats, other than oyster reefs, along the Texas coast. Along with the formation of the jetties, a new rocky shore habitat was created for animals and plants that spend the major portion of their lives attached to a hard substrate. Many of these plants and animals begin life as free-floating plankton, either phytoplankton (planktonic plant-like organisms) or zooplankton (planktonic animals). These immature, planktonic plants and animals float freely in the water until they reach a suitable substrate, whereupon they attach themselves and then lead a stationary existence for the remainder of their lives.

For example, barnacles are crustaceans that spend their adult lives clinging by their heads to the jetty rocks. Unlike their fellow crustaceans, the free-living crabs and shrimp, adult barnacles glue themselves permanently to hard surfaces and secrete a series of shell-like plates around the sides of their bodies. The upper-most plates open, allowing the barnacle to extend feeding legs that filter planktonic food from the water with feather-like branches. However, immature barnacles are very different from the stationary adults. They spend weeks floating and swimming in the plankton before they settle on a suitable hard surface (rocks, pilings, boats or other organisms), where they attach and change into stationary adults.

Oyster Reefs

Coastal wetlands are very productive habitats but they can also be very harsh places to live, due to sometimes rapid fluctuations in water level, salinity, temperature and oxygen. Stationary animals are

not common in estuaries because they cannot run away from unfavorable changes or easily find hard substrates to which to attach themselves, but oysters are an exception.

Oyster reefs are the only naturally occurring hard substrates on the muddy bay floors of the Texas coast. Free-swimming immature oysters, known as spat, only need a small piece of shell or rock for attachment, but once attached, their shells provide a surface for the attachment of additional oysters. In fact, given a choice, oysters prefer to attach to other oysters, rather than to rocks or concrete pilings.

As oysters continue to accrue, a large oyster reef habitat may form that attracts many other organisms, seeking food or shelter. Barnacles, mussels and anemones attach themselves to oyster reefs. Blue crabs and fishes (blennies, gobies and redfish) shelter themselves in reefs. Stone crabs feed on oysters, as does the American oyster catcher, an interesting shore bird that uses its beak like an oyster knife to pry the oyster out of his shell.

Conclusion

Coastal wetlands are vitally important to our environment and our economy. They provide essential habitat for organisms that we eat, such as oysters, shrimps, crabs, and fishes. Wetland plants, such as smooth cordgrass, salt grass, and mangroves, stabilize our shorelines and help prevent erosion. Salt marshes and estuaries also filter and clean our water and act as sponges to absorb excess water and reduce flooding.

Volunteer Job Description

Objective

To convey the ecological and economic importance of coastal wetlands, the Mission-Aransas National Estuarine Research Reserve, and the Wetlands Education Center to the public.

Characteristics and Experiences

Docents must be enthusiastic, cheerful, professional, and willing to learn. They should have an interest in working with the general public. It is essential that Docents are comfortable with public speaking and have the capability of memorizing talking points. Experience in natural history, environmental or marine science, and/or education are helpful but not required.

Supervision & Training

Docents will complete an introductory training with volunteer supervisor, compliance training, and read and familiarize themselves with the Wetlands Education Center docent training manual. Docents will be shadowed on tours until they feel comfortable enough to lead a quality tour, without assistance. WEC docents will develop their own individualized talk for 45 minute tours based on the information covered in the docent training manual.

Requirements

- Minimum age of 15 years
- Receive and follow directions from volunteer supervisor
- Work a one hour shift
- Walk and talk for one hour
- Withstand hot summer and / or cold winter temperatures

Activities and Responsibilities

WEC Docents are responsible for leading guests through the Wetlands Education Center on a guided tour that emphasizes the economic and ecological importance of estuaries. Great docents greet guests in the UTMSI visitor center as they walk in. Docents should encourage guests to sign the guest book and let guests know about the upcoming guided tour. Docents should make guests feel welcome without overwhelming or pestering guests. Docents are also responsible for supporting partner agencies and organizations.

RESOURCES

Additional Information for Docents

The Animal Rehabilitation Keep

Closed to the public, the Animal Rehabilitation Keep (ARK) rehabilitates aquatic birds, sea turtles, terrestrial turtles and tortoises. The goal of the ARK is to rescue and rehabilitate wildlife found sick or injured in the area adjacent to and including Mustang, San Jose and Padre Islands, including the Mission-Aransas National Research Reserve, Corpus Christi Bay and the Upper Laguna Madre.

NOAA Geodetic Survey Marker

The NERRs are working with NOAA to establish survey markers on reserve sites, as part of the National Spatial Reference System. Spatial Reference System coordinates, such as the bronze geodetic marker, here at the Center, provide extremely accurate latitude, longitude and height information, which is useful when monitoring environmental changes, such as changes in sea level and the official national shoreline.

Interpretive Exhibits at UTMSI

Interpretive exhibits and aquaria in the UTMSI Visitor's Center focus on the fishes and other creatures that live in the Gulf of Mexico.

Interdependence Statue

This statue was donated in 2012 by the UTMSI Advisory Council. It was masterfully crafted by the famous sculptor Kent Ulberg. There are 50 different species depicted in the form of a large Tarpon.

Sample Schedule from a Docent Training Workshop

Docent training workshops will be offered periodically, as the need arises. The workshops are held from 9:00 a.m. to 4:00 p.m. in the UTMSI Visitor Center auditorium, the WEC, and the Pier Lab, on the campus of UTMSI. The workshops are highly hands-on and will involve field and lab observations and activities.

Schedule:

9:00-9:15	Welcome and Introductions
9:15-10:00	WEC Tour
10:15-10:45	Overview of Marine Education Services, Mission-Aransas Reserve, and the WEC
10:45-11:00	Descriptions of opportunities for education docents
11:00- 12:00	Oyster Reefs (reef formation, oyster morphology and life cycle, importance)
12:00-1:00	Lunch at UTMSI Cafeteria or brown bag
1:00-2:30	WEC Plants (marsh and dune, adaptations, identification, importance)
2:30-3:00	Barrier Islands and Passes (formation, change through time, importance)
3:00-3:45	Rock Jetties (jetty organisms, adaptation, identification, importance)
3:45-4:00	Discussion of volunteer paperwork and compliance Questions and Wrap-up

Plants of the WEC

Physalis cinerascens
Ground cherry

Machaeranthera phyllocephala
Camphor daisy

Ratibida peduncularis
Naked mexican hat

Chamaecrista fasciculata
Partridge pea

Borrichia frutescens
Sea-ox-eye daisy

Plants of the WEC

Helianthus annuus
Common sunflower

Oenothera drummundii
Beach evening primrose

Heterotheca subaxillaris
Camphor Weed

Helianthus argophyllus
Silverleaf sunflower

Flaveria brownii
Brown's yellowtops

Plants of the WEC

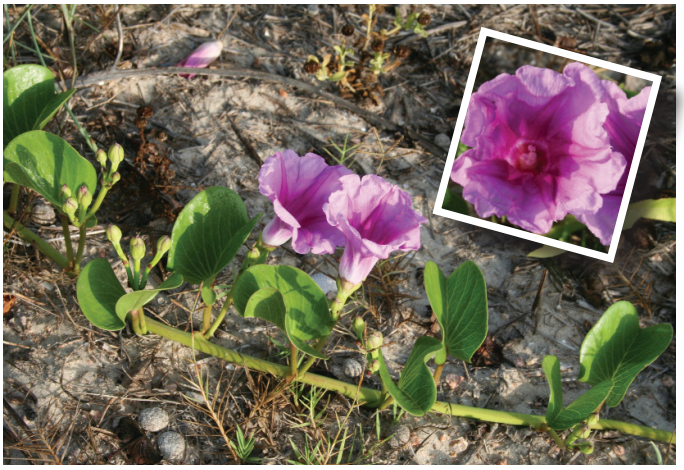
Eustoma exaltatum
Bluebell gentian

Eupatorium glaucescens
Mistflower

Dalea emarginata
Wedgeleaf prairie clover

Centrosema virginianum
Butterfly pea

Commelina erecta
Dayflower



Ipomoea pes-caprae
Railroad vine

Plants of the WEC

Mimosa strigillosa
Powderpuff

Phyla nodiflora
Texas frog fruit

Boerhaavia coccinea
Scarlet spiderling

Ipomoea imperati
Beach morning glory

Indigofera miniata
Scarlet pea

Croton capitatus
Woolly croton

Plants of the WEC

Batis maritima
Saltwort

Suaeda spp.
Suaeda

Salicornia virginica
Glasswort, Pickleweed

Samolus ebracteatus
Sea beach pimpernel

Portulaca pilosa
Shaggy portulaca

Sesuvium portulacastrum
Sea purslane

Plants of the WEC

Panicum amarum
Bitter panicum

Paspalum monostachyum
Gulfdune paspalum

Spartina patens
Marshhay cordgrass

Panicum maximum
Guinea grass*

Fimbristylis castanea
Fimbry

Plants of the WEC

Spartina alterniflora
Smooth cordgrass

Distichlis spicata
Saltgrass

Cyperus spp.
Flat sedge

Spartina spartinae
Gulf cordgrass

Schizachyrium scoparium
Seacoast bluestem

Plants of the WEC

Schinus terebinthifolius
Brazilian pepper-tree*

Schinus terebinthifolius
Brazilian pepper-tree*

Lantana camara
West Indian lantana

Avicennia germinans
Black mangrove

Croton punctatus
Beach tea

Plants of the WEC

Ipomoea cordatotriloba
Tie vine

Heliotropium curassavicum
Seaside heliotrope

Hydrocotyle bonariensis
Water-pennywort

Eustoma exaltatum
Bluebell gentian

Senecio riddelii
Broom groundsel

Birds of the WEC

Ardea herodias
Great blue heron

Ardea alba
Great egret

Ixobrychus exilis
Least bittern

Eudocimus albus
Juvenile White Ibis

Egretta thula
Snowy Egret

Birds of the WEC

Larus argentatus
Herring gull

Larus delawarensis
Ring-billed gull

Larus atricilla
Laughing gull

Pelecanus occidentalis
Juvenile (left) & Adult Brown Pelican (right)

Sterna maxima
Royal Tern

Other Common Critters of the WEC

Uca pugnax
Fiddler Crab (Burrows)

Atta texana
Texas Leafcutter Ant

Solenopsis invicta
Fire Ant*

Crassostrea virginica
American Oysters

Mugil cephalus
Mullet

Chelonia mydas
Green Sea Turtle

* Indicates a non-native species.

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