



# The Gulf Breeze

The official newspaper of  
Padre Island National Seashore

Summer 2010



Padre Island National Seashore protects the longest section of undeveloped barrier island in the world, preserving rare coastal prairie, a complex, dynamic dune system, and the Laguna Madre, one of the few hypersaline lagoon environments left in the world.

## Greetings from the Superintendent

WELCOME TO PADRE ISLAND NATIONAL SEASHORE, THE longest remaining undeveloped stretch of barrier island in the world. Our mission is to save and preserve this great park, unimpaired, for purposes of public recreation, benefit, and inspiration. The Padre Island National Seashore team pledges to give a 100% effort in carrying out this mission and we hope that you have an outstanding experience as you explore and enjoy this national treasure. While you are here, take some time to observe the surrounding areas. Whether you are enjoying the beach, launching your boat or windsurfing at Bird Island Basin, driving, or simply walking, there is always something to see.

Spring and summer are a busy time here at the Seashore, and as we enter this time of year, we ask that you be vigilant. During the spring and summer months there is a flurry of activity on the beach. You will see turtle patrollers searching for nests, schoolchildren on field trips, families recreating, anglers surf fishing, and vehicles of all sizes driving up and down the shoreline. For the safety of everyone and to protect our natural resources, the speed limit for the entire length of the beach is 15 miles per hour from April 15 through July 5. The Kemp's ridley turtles nest during this time of year and if you are not paying attention, you may miss the opportunity to witness a nesting event. From June through August, you will also have the opportunity to view turtle hatchling releases on the beach.

Bird Island Basin is another popular area which many boaters, campers and windsurfers visit during the spring. Again, when enjoying this area, be aware of your surroundings and courteous to your fellow visitors. To make this increasingly popular area available to as many visitors as possible, please heed the rules and signs in place for the boat ramp and campgrounds. If you have questions, never hesitate to ask a park ranger.

We do our best to provide visitors with an experience in nature unaffected by progress, and while you are here we ask that you extend that courtesy to your fellow visitors. Please remember that the National Park Service, visitors, and neighbors are all stewards of this special place, and we must work together to protect and care for Padre Island National Seashore so that it may be enjoyed unimpaired for generations to come. Whether you are touring the country or are from the local community, we hope that you enjoy your visit and plan to return. Be safe and we look forward to seeing you again.

Joe Escoto, Superintendent

## Red-Tide Fish Kills Affect Coyotes and Dogs in Park

*Cheyenne Nevada, Biological Science Technician*

ABOUT TWO WEEKS AFTER A MAJOR FISH KILL IN MID-October, a park biological technician returned from a weekly trip to the channel to report that two coyotes, 20 miles apart, were found dead on the beach. A week later, another coyote was found dead and a video was made of a sick coyote. The animal was behaving as if it had been drugged and was unable to use its legs. At that time, the park did not have a definite explanation for the illness. It was believed that the coyotes were becoming ill as a result of eating dead, spoiled fish species off the beach. On November 21, as a preventative measure, pets were prohibited from the park.

Since then, at least 12 coyotes and three domestic dogs died or have been euthanized as a result of possible brevetoxin poisoning. In addition, at least another 11 canines showed symptoms of brevetoxin poisoning. Of those animals that perished, three coyotes and a dog were submitted for necropsy. Laboratory test results revealed very high brevetoxin levels in all four animals. Other illnesses, such as rabies, canine distemper, toxoplasma, botulism and heartworms, had been ruled out as a cause of death. Also ruled out were several types of possible poisonings.



Dead fish as a result of red tide, October 2009

The first signs of red tide were observed in September of 2009. By mid-October, more than 60 miles of seashore were besieged with millions of dead fish and eel. It was confirmed that *Karenia brevis* (*K. brevis*) was the perpetrator. Red tide is not a new phenomenon to our area.

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## Need-to-know info

**IN CASE OF EMERGENCY,**

**DIAL 911**

**Park rangers are available during normal working hours to provide assistance.**

**Lost-and-found items may be reported at the visitor center.**

*Continued on page 4*





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National Park Service  
Editors: Juan Rodriguez and Chelsea Aldrich  
Superintendent: Joe Escoto

Mailing Address:  
P.O. Box 181300  
Corpus Christi, TX 78480-1300

Park Headquarters:  
(361) 949-8173

Visitor Center:  
(361) 949-8068

Beach/Weather Conditions  
(361) 949-8175

Internet Address:  
[www.nps.gov/pais](http://www.nps.gov/pais)

E-mail address:  
[pais\\_visitor\\_center@nps.gov](mailto:pais_visitor_center@nps.gov)

The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

## Interpretive Programs

Program	Time
Beach Walk	11:00 a.m. <i>Daily</i>
Deck Talk	1:00 p.m. <i>Daily</i>
Star Parties	July, 17, 2010 @ 9 p.m. <i>Additional programs may occur. Call ahead for details.</i>
Junior Ranger	Self-paced

*Programs are subject to change. For more information, please contact the Malaquite Visitor Center at (361) 949-8068, or visit the park's website at [www.nps.gov/pais](http://www.nps.gov/pais).*

### Hours

Padre Island National Seashore is open 24 hours a day, 365 days a year. The Malaquite Visitor Center is open daily, from 9:00 a.m. to 5:00 p.m., year-round. The Malaquite Visitor Center and concessionaire are closed on Christmas day.

### Location

The park's physical address is 20301 Park Road 22. From Interstate Highway 37, turn onto Highway 358. The highway then crosses over the Laguna Madre on the JFK Causeway and becomes Park Road 22 once on Padre Island. At the end of Park Road 22 is the National Seashore's entrance station. Traveling through the park takes one to the Malaquite Visitor Center. Approximately one-half of a mile farther down the road, the pavement ends and beach access begins. The total driving distance from I-37 to the beach is approximately 37 miles.

### Education and Interpretive Programs

Deck Talks and Beach Walks are held every day. Deck Talks last around 30-45 minutes and can feature a variety of topics, including the numerous interesting items that can be found along the shoreline. Beach Walks last around 45-60 minutes and are taken at an easy-going pace along the beach with a ranger. On the walk, you may learn about the natural and cultural history of the island, or you may discover some interesting things that have washed ashore. Family programs may be offered at the Malaquite Visitor Center during the summer months, and from January through April, birding tours are led by park volunteers who stop at various locations around the park. Star parties are held intermittently throughout the year, usually on Saturdays. The National Seashore also offers environmental education programs for school groups of all ages that give children a hands-on experience with nature. Contact the park's Environmental Education specialist, Buzz Botts, at (361) 949-8068 for more detailed information and to make a reservation for your group.

### Available Facilities

The Malaquite Visitor Center has an information desk, small museum, bookstore, concession stand, observation decks, restrooms, and cold-water rinse showers (closed only from 7 - 9 a.m. for cleaning). The visitor center is fully wheelchair accessible with ramps to the main deck and an elevator to the main observation deck. Beach wheelchairs are available for use from 9 a.m. - 5 p.m. daily. Please contact the visitor center for more information.

### Camping

All camping is on a first-come, first-served basis, and no reservations are accepted.

There is a 14-consecutive-day limit for camping, and after 14 days you must leave the park for 48 hours before returning again for camping. Overnight camping is limited to a total of 56 days in a calendar year. All camping requires a permit, which is available at the camping and registration kiosks located at the Entrance Station, Malaquite Campground, Bird Island Basin Campground, and the entrance to South Beach. Permits must be displayed on vehicles.

### Malaquite Campground

(\$8/night or \$4 with an Interagency pass)

Semi-primitive, providing toilets, cold-water rinse showers, picnic tables, BBQ grills, and 48 designated sites (six sites are for tent camping only). An \$8 fee is required per site or \$4 with an Interagency Senior or Access pass. Please deposit your payment in the envelope provided in the Iron Ranger. There are no electric hookups available, but there is a dump station and potable water filling station near the campground entrance. Quiet hours are from 10 p.m. to 6 a.m. The area is patrolled by rangers. Camping is accommodated on a first-come, first-served basis and reservations are not accepted. The campground is rarely full, except during February, March, and April.

### North Beach

(No Fee)

Primitive and free for RVs and tents. A camping permit is required and is available at the Entrance Station. There are no facilities or designated sites, and camping is permitted from the dunes to the water's edge (up to 100 feet), and is accessible for two-wheel drive vehicles. Beach conditions may vary with weather, and campers should always use caution to avoid becoming stuck in soft sand.

### South Beach

(No Fee)

Primitive and free for RVs and tents. A camping permit is required and is available from the camping registration kiosk located at the start of the driving beach. A pit toilet and dumpster are located at the entrance to South Beach, but campers are welcome to use the bathhouse at Malaquite Visitor Center. Camping is permitted from the base of the dunes to the water's edge (up to 100-ft. distance). The camping area extends from the end of Park Road 22 to the southern boundary of the park at the Mansfield Channel.

There are no roads and all driving is on the beach. Four-wheel drive is recommended past the 5-Mile Marker and all driving is at your own risk. Be aware that driving conditions on the beach may vary with the weather and areas of soft sand may be

sometimes found in the two-wheel-drive area, making driving difficult and possibly causing a vehicle to become stuck. Wrecker services can be costly and response time slow. Some areas within the four-wheel drive area have very deep, soft sand. A bulletin on how to prepare for driving down island is available by contacting the visitor center. Contact the visitor center before driving down island to check on beach conditions.

Please note that, in Texas, beaches are considered highways, and all vehicles must be street-legal and licensed. Licensed and unlicensed ATVs, UTVs, go carts, and dune buggies are not allowed to be driven in the park. Driving off the beach and into the dunes, grasslands, and mudflats is prohibited.

### Yarborough Pass

(No Fee; Open intermittently)

Primitive and free tent camping area. A camping permit is required and is available from the South Beach camping and registration kiosk. You can access the campground by driving down South Beach. Drive to the 15-Mile Marker and then backtrack approximately 100 yards. Look for a notch in the dunes and drive through the pass. Follow the road approximately two miles to the campground, which is located on the Laguna Madre. Be aware that the pass through the dunes is sometimes filled with exceptionally deep and soft sand in which even four-wheel drive vehicles may become stuck. Driving on the mudflats surrounding the campground is not permitted because it is a fragile and important habitat. Fines for damaging the mudflats are heavy.

### Bird Island Basin

(\$5/night or \$2.50 with an Interagency pass)

Semi-primitive, only providing pit toilets. Bird Island Basin is located on the Laguna Madre, approximately four miles from the visitor center. In addition to camping, there is a windsurfing and kayaking area with rentals and lessons available. There is also a boat launch ramp that can accommodate 116 vehicle-and-trailer combinations of approximately 40 feet.

All designated camping and day-use sites are semi-primitive. A camping permit is required and is available at the Entrance Station or Bird Island Basin Campground kiosk. Bird Island Basin is suitable for both RV and tent camping, and pit toilets are available. A pass for \$5.00 per day or \$10 annually, is required for camping, day-use, and boat ramp use is charged at the entrance station in addition to the park entrance fee. If you possess an Interagency Senior or Access pass, the fees are reduced by half.



# Update on the Sea Turtle Project

Donna J. Shaver, Ph.D.

Chief, Division of Sea Turtle Science and Recovery

STAFF AND VOLUNTEERS WITH THE DIVISION OF SEA TURTLE SCIENCE AND Recovery have been busy helping deal with the largest “cold stunning” event of sea turtles recorded on the Texas coast since the Sea Turtle Stranding and Salvage Network was established in 1980. Additionally, they are preparing for the upcoming Kemp’s ridley sea turtle nesting season, which will hopefully be the seventh consecutive record year of Kemp’s ridley nesting on the Texas coast since consistent record-keeping began in 1980.

## Cold stunning of juvenile green sea turtles

From January 9-28, 2010, 442 sea turtles were found “cold stunned” on the Texas coast. This is more turtles than found stranded in Texas for the entire year during 24 of the last 30 years.

Every few years, south Texas experiences freezing air temperatures which incapacitate sea turtles. Sea turtles cannot regulate their body temperature. During these “cold stunning” events, the turtles float to the surface and some wash ashore, driven by strong prevailing winds. While in this coma-like condition, they can succumb from prolonged exposure to the cold and predation. However, if they are found rapidly and transported to rehabilitation facilities, there is a good chance that they can be revived and released after waters warm.

The cold stunned turtles found during January 2010 included 440 green sea turtles and two loggerhead sea turtles. Both species are classified as threatened and all individuals found were juveniles. These turtles were located along the entire Texas coast, mostly in inshore areas (canals, bays, estuaries, passes). Middle and south Texas bays and channels provide important developmental habitat for juvenile green turtles. However, when water and air temperatures become very cold, they can fall victim to cold stunning.



Park rangers rescue and transport a cold stunned sea turtle

It was a very large undertaking to find, transport, document, tag, medically treat, release, and maintain records of cold stunned turtles. In our area alone, the University of Texas Marine Science Institute’s Animal Rehabilitation Keep (ARK), Texas Parks and Wildlife Department, National Park Service, Texas State Aquarium, Oso Bay Animal Clinic, U.S. Fish and Wildlife Service, and other groups have helped. Many citizens also assisted and reports from the public were extremely helpful in locating many of these turtles.

Of the 442 sea turtles found cold stunned, about one-third were alive when located. Live individuals were transported to authorized facilities to receive medical evaluation and care. Locally, live turtles from this event were held at the ARK and Texas State Aquarium. Most survived and were released after their medical conditions were stabilized and water temperatures warmed here.

The green sea turtle population was once thriving in Texas, but became depleted due to severe freezes and overexploitation during the late 1800s. The large number of green turtles found stranded during this cold stunning event is an indicator that after years of conservation efforts the juvenile green turtle population is increasing in Texas. Saving turtles during this event will help with recovery efforts for this threatened species.

You could find a cold stunned turtle that has not been reported yet from this event or one that becomes cold stunned in the future. All reports are important, even if the turtles are dead. If you find a sea turtle floating or washed ashore (alive or dead), please report it immediately by phoning me at (361) 949-8173, ext. 226. Please be aware that many cold stunned turtles that are still alive will often be motionless and appear to be dead. However, if these turtles are found and taken to a rehabilitation facility quickly enough, they can be saved and released when temperatures increase.

## Kemp’s ridley sea turtle nesting

Kemp’s ridley is the most endangered sea turtle species in the world and Padre Island National Seashore is the most important nesting beach in the U.S. for this species.

Kemp’s ridley has been the focus of global recovery efforts for decades. Most nest along the Gulf of Mexico coastline in Tamaulipas, Mexico, with the epicenter of nesting near the village of Rancho Nuevo. Since 1978, the National Park Service has been working with many partners in the U.S. and Mexico to increase nesting by this native species at the National Seashore. One objective has been for the National Seashore to serve as a safeguard against extinction, in the event that a political or environmental disaster occurs

at their nesting area in Mexico. Thanks to the hard work of many people, nesting is increasing rapidly. A record 197 Kemp’s ridley nests were documented on the Texas coast in 2009, including 117 at Padre Island National Seashore.

From April through mid-July, staff and volunteers use Utility Transport Vehicles (UTVs) to search the Gulf of Mexico beachfront on North Padre Island to find and protect the nesting turtles and their nests. It only takes the nesters 45 minutes to crawl up the beach, bury their eggs in the sand, and return to the sea. Nesting occurs anywhere from the high tide line into the dunes, mostly during the day, often in windy conditions, and often in groups or simultaneous emergences called *arribadas*.



A Kemp’s ridley sea turtle nesting in the foredune

To help increase the population here and aid with species recovery, we want to find the nests so that we can protect the eggs and produce as many hatchlings as possible. Eggs from most nests found on North Padre Island and northward along the Texas coast are brought to the National Seashore’s incubation facility for protected care and monitoring. Eggs are also protected in screen enclosures on the beach called corrals. One of these corrals is located at the National Seashore and one on South Padre Island. Each year, a few nests go undetected at egg laying and are later found, but typically, mortality of eggs or hatchlings occurs in these.

Visitors find and report some nests each year. To alert them and gain their help in locating nests, the “nesting Kemp’s ridley alert” flag is flown on the National Seashore Entrance Station and Malaquite Pavilion flagpoles each day that a Kemp’s ridley nest is found on the Texas coast. The rectangular flag has bright yellow background and a black silhouette of a sea turtle. Nesting can occur on any day of the nesting season, but when the flag is flown, the probability of finding nests increases because of *arribada* nesting.

Please help us by watching for nesting Kemp’s ridley turtles and their tracks from April through mid-July, and for hatchlings emerging from previously undetected nests from late-May through August. Nesters can be difficult to see because their olive-green color blends with the sand and vegetation, especially when they become covered with sand during nesting. They sometimes nest in vehicle ruts and cannot move quickly to avoid an approaching vehicle. In fact, while they are actually laying eggs they enter a trance-like state and will not move from the nest. Drive cautiously and be prepared for delays in travel on the beach to enable nesting turtles and hatchlings to be safe and undisturbed on the beach, and time for biologists to document and protect the nests.

Please IMMEDIATELY report all observations to a passing turtle patroller or by calling (361) 949-8173, ext. 226. Please mark the site clearly. If possible, stay at the site until a biologist arrives. If you find a nesting turtle: (1) allow her to nest undisturbed; (2) protect her from passing traffic; (3) stay back while she is crawling up the beach to select a nest site and starts to lay eggs; (4) after she has started to lay eggs, mark where she nested but do not pierce anything into the sand or you could puncture eggs; (5) examine her flippers for tags and note any tag numbers found; (6) photograph or video her from a downward profile; and (7) allow her to safely re-enter the water.

From June through mid-August, after 45-53 days of incubation, the hatchlings born in the incubation facility are released on the beach at the northern end of the National Seashore. Each year, about 20 releases are open to the public and over 4,000 visitors attend free-of-charge. For more information on these releases, visit our website at [www.nps.gov/pais/](http://www.nps.gov/pais/), where the projected dates for release of each nest are posted. Information on the next upcoming release can be obtained by calling our recorded Hatchling Hotline at (361) 949-7163.



A hatchling heads to its home in the Gulf



However, death of terrestrial mammals associated with red tide was not as well-known. What we later learned has sparked interest in pet owners, veterinarians, and researchers.

*K. brevis* is one of several microscopic, single-celled algae that are naturally occurring in the ocean. In optimal conditions, their numbers can become so pronounced that the water may change color, an event referred to as an *algal bloom*. Like other living organisms, *K. brevis* uses oxygen. During a bloom, oxygen can be depleted in the water to a point that fish cannot survive. This is also why fish die during a non-toxic bloom.

Brevetoxin, a neurotoxin, is released when *K. brevis* cells rupture. Fish exposed to the toxin can suffer paralysis of the respiratory system and die. The brevetoxin adheres to the slime covering the fish. Once beached, the brevetoxin becomes more concentrated as the fish loses moisture and transforms into something resembling fish jerky. Brevetoxin is a stable compound and how long it remains stable is something the park is trying to answer.

Weekly, different species of dead fish, water and soil samples from different locations were collected from the high tide line. Those samples were sent for testing. The results were to reveal if those samples contained brevetoxin and if so, how much. We expect to see a decline in brevetoxin levels over time with exposure to the elements, such as sunlight, rain, and surf. Knowing how long the toxin remains stable on the beach will allow park management and pet owners to make better decisions as to how long to keep pets from the beach during future red tide events.



Accessing fish kills

As the numbers of dead fish on the beach diminished, the ban on pets was lifted on December 29, 2009. By keeping pets on a six-foot leash, exposure to tainted fish is minimized. However, the possibility of illness still exists. The last known coyote mortality was on January 10, 2010.

Brevetoxin poisoning may occur from eating or licking, dead or decaying fish or other items on the beach. A park employee stated that her pet became lethargic for two days after playing with a plastic dog toy that was removed from the beach. Also, exposure to the water, foam, or sand and sediment can cause illness. Clinical signs can occur very quickly after a limited time on the beach. In one case, the dog became ill after 20 minutes on the beach.



Coyote showing distressed neurological symptoms

Brevetoxin poisoning can cause: excessive drooling, vomiting, lethargy (lack of energy), decreased appetite, weakness in limbs, inability to hold up the head properly, respiratory difficulty, and head or body tremors or seizures. If your dog exhibits any of these signs, please take your pet to the veterinarian immediately. There is no antidote or agent used to neutralize the toxin.

Nor is there a speedy in-office test to determine brevetoxin poisoning. Depending on how ill your pet has become, it may need to spend a few days in a veterinarian clinic.

Padre Island National Seashore would like to thank all the volunteers who participated in the Behind the Dunes Survey conducted on December 1, 2009. This survey covered an area that was 200 meters wide and 25 miles long behind the dunes. Fortunately, no sick or dead coyotes were found. Without the volunteers, this would not have been possible.

## Showers Bring Wildflowers

Suzy Evans, Park Ranger

THE DROUGHT LAST YEAR RESULTED IN A DISAPPOINTING SHOW OF WILDflowers. It is hoped that the recent rains will bring a dazzling wildflower display this year. With the severe drought that plagued most of South Texas, Padre Island received far less than the 30 inch average annual rainfall. As a result of El Niño conditions in the Pacific Ocean, rainfall is now 150% to 200% above average.

The wildflowers found at Padre Island National Seashore have to be a particularly hearty breed in order to flourish in this harsh environment. The dunes contain almost pure sand while the lower elevations contain clay mixed with sand. Because Padre Island is located between the Gulf of Mexico and the Laguna Madre, the soil has a high salt content which can inhibit plant growth. Salt spray is created when waves break, and the wind blows water droplets inland. As the water evaporates, salt particles fall to the ground. High temperatures are another challenge. As anyone who has walked on the beach in the summer knows, bare sand surfaces temperatures can be much higher than the air temperature. The strong predominately south-east wind can also cover plants with sand. One such hearty plant is the Railroad Vine or Goats Foot Morning Glory. Its purple blooms are seen in summer and fall. This is often one of the first plants to begin growing as dunes form. With adequate moisture, the stems can average ten inches of growth a day.



Railroad Vine



Camphor Daisy

The Camphor Daisy, which blooms spring, summer and fall, has a yellow flower with a yellow center and sharp-toothed or lobed leaves. The plant gives off a camphor odor when it is bruised.



Camphorweed

The Camphorweed, as its name implies, also gives off the same medicinal odor. Its leaves are rough and slightly sticky, but the leaf margins are smooth. Camphorweed has anti-inflammatory properties and can be mixed with alcohol and used as a liniment for sprains or arthritis. Bathing in a strong tea will also have the same effect. An antiseptic can be made from the whole plant that can be used to wash scrapes or cuts.

The flower of the Texas Prickly Pear, which blooms in spring to early summer, is very showy, with colors from bright red to yellow. The stamens are sensitive to pressure and move when touched. The juicy fruit, known as tunas, provides food for wild animals and humans. Jelly or jam can also be made from the fruit. The pads, also known as nopales, are also edible and can be cooked in various ways. The juice may be used to sooth the skin and draw fluid from wounds.



Texas Prickly Pear



Indian Blanket

Indian Blanket, which has red petals tipped with yellow, blooms in spring and summer. These showy blooms are sometimes cultivated because they are drought tolerant. The name comes from a legend about a blanket maker who wished to thank the Great Spirit for his many blessings. He wove a beautiful blanket using the colors of the sunset and requested that upon his death, he would be buried in the blanket so that he could present it to the Great Spirit. The Great Spirit was so pleased with the gift that he covered the ground with flowers of the same colors as the blanket. Many Native American tribes used a tea made from this plant to relieve urinary problems. The flower can also be used to make pale green or bright yellow dyes.

er the ground with flowers of the same colors as the blanket. Many Native American tribes used a tea made from this plant to relieve urinary problems. The flower can also be used to make pale green or bright yellow dyes.

Gulf croton, or Beach Tea, is salt tolerant and will replace competing plants when they are overgrazed. The flowers, which are very small, bloom in spring, summer, and fall. The leaves are toxic and animals will not eat them, even if it is the only plant available. It was once used for medicines in Europe, but it is now considered too dangerous. The oil is a very strong and dangerous laxative with just a drop causing an extreme effect. The oil may also cause severe dermatitis, but when diluted with olive oil or Vaseline, it can be used as a liniment or counter irritant for arthritis. The Great Plains and Pueblo Indians used the leaves to make a tea for stomachaches and for bathing sick babies. The Pueblos also used the tea as a purgative and for treating urinary problems and snakebites. Plants can be put in insect infested mattresses to kill pests. Crotonic acid is used to make PVC plastic.

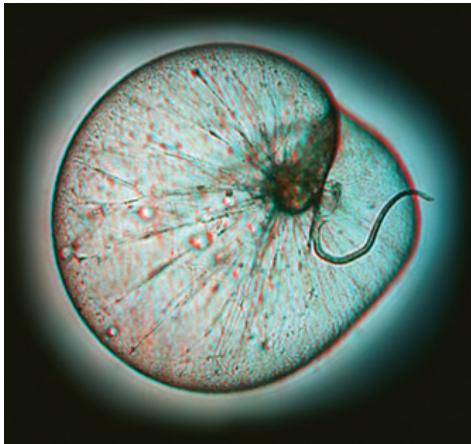
Watch for the display of wildflowers this spring, summer and fall, and see how many wildflowers you can identify or just sit back and enjoy the view.



# What Is That Mysterious Glow?

William "Buzz" Botts, Park Ranger

HAVE YOU EVER CHASED FIREFLIES AT NIGHT OR MARVELED AT THEIR AMAZING flickers of light as they drifted aimlessly across your lawn? If you have, then you already have a partial understanding of what people sometimes see in the night surf along the Texas coast. No, those are not fireflies sparkling in the waves, but different animals that use the same basic chemical process to produce light. A type of single-celled plankton, called a *dinoflagellate*, produces the pinpoints of light. The result looks like millions of tiny cameras flashing as the waves roll in. Scientists know the common plankton culprit responsible for the spectacular sea glitter is often *Noctiluca* (nok-tuh-loo-kuh) which means "night light". Not only does it sparkle, it's unique in another way; it has some plant-like characteristics that lead some marine scientists to classify it as a type of algae, which would make it a plant. However, since it makes a living eating smaller plankton, other biologists classify it as an animal. Whether you call it a plant or an animal, it's still very unusual!



Noctiluca

*Bioluminescence* is the word marine biologists use to describe the light-generating process among animals. That's just another way of saying "biologically-produced light". While various animals can produce the light, there are even a few plants that generate light through a similar process. Whether fireflies, squid, or plankton produces the light, the chemical process seems to be the same. The animals convert enzymes into byproducts that give off light. The process could be compared to the light produced in human made "glow sticks" that combine chemicals when the sticks are cracked and shaken to produce light. Although more advanced animals, such as fireflies, can switch the light on and off to signal to potential mates, there is some debate among marine scientists regarding what purpose the lights serve for *Noctiluca*. Many believe that it's simply a byproduct of nervous stimulation created when the plankton is disturbed. Others think that simple predatory animals may avoid preying on *Noctiluca* to avoid becoming bioluminescent themselves, an attribute that could make them more readily seen and caught by other organisms.



Bioluminescence in the Gulf's night surf

People snorkeling or scuba diving at night are often amazed to see a swirl of sparkling light coming off their hands or feet as they swim through the sea water and unwittingly disturb the *Noctiluca* and other bioluminescent plankton. Fish and sea turtles also generate the same spectacular show as they swim by causing the plankton to twinkle! If you time your night stroll along the beach just right,

you may find that even the sand "glows" when the hapless plankton are left stranded along the water's edge by the receding waves. Wiping a finger or toe across the sand can create enough stimulation for the tiny stranded animals to produce a few last sparkles.

While not all species of plankton produce light, the ones that do can be really conspicuous because of their huge numbers. Scientists in California did a study in which they counted the light-producing plankton along the Pacific coast and found as many as three million of the little animals per quart of seawater! As insignificant as those little glowing creatures may appear, they are very important to us all. They make up a small, but unique and highly plentiful, part of the ocean's food web. They may not seem like much of a meal but what they lack in size, they make up for in numbers. That's why all plankton is preyed upon by other organisms. Through the food chain, their nutritive value is eventually passed along to humans when seafood of any kind is consumed. So the next time you're taking a night stroll and see *Noctiluca* sparkling, keep in mind that not only is that mysterious light entertaining, but that those little animals feed you each time you sit down for a seafood platter!

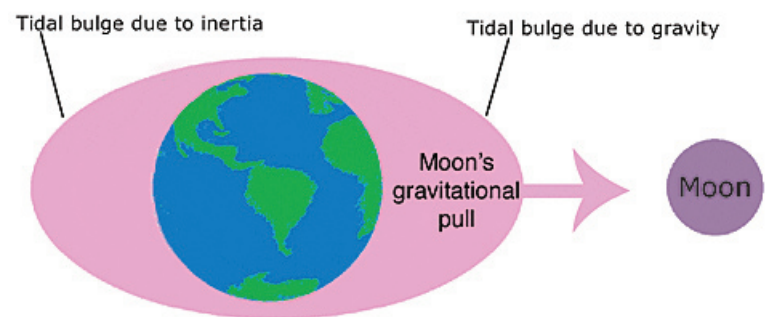
# Why Tides Keep Us on Our Toes

Chelsea Aldrich, Park Ranger

WHEN I WAS A LITTLE GIRL, I LIVED ON THE SHORES OF RHODE ISLAND. MY brother and I had a secret place that we always visited to dig clams and go fishing, and the path that led to this place was even more of a hidden secret. In order to get there, we would have to balance across a rickety old railroad trestle that went over a fairly wide stream. Typically, we would have to brave the rusty trestle and practice not looking down, and I silently dreaded crossing it, but I knew I had an obligation to be brave because I was the oldest. One time, I was relieved to discover some rocks in the water that I hadn't noticed in all of my other trips to this place. How and when did they get there? Even though they were slippery, I leaped happily across, seeking refuge on the other side, and felt only slightly guilty that I had taken the easy way out. We spent the day digging for clams and fishing just like any other trip, but when it came time to go I noticed that my stepping stones had disappeared, and I was left with no choice but to cross the trestle that was only illuminated by the moonlight.

As the years passed, we learned to see a scheduled pattern of when the rocks were flooded and when they were available for our passage, but we never fully understood why and how the tide brought water in and out time and time again. Seafarers and beachgoers worldwide oftentimes rely on knowing the tides so that they can maximize their fish catch, improve their beachcombing success, or camp and play on the beach without getting wet. Tide changes are predictable and regular, occurring every six hours, and you can set your clock by them, right? Well, that is not the case at Padre Island National Seashore. Here, the tides vary daily, both in frequency and height, sometimes making enjoying the perfectly planned beach trip quite an unexpected challenge. But first, let's get a better understanding of what causes the tides by recalling our school lessons on Sir Isaac Newton's law of gravity.

Newton's law explains that the bigger the size of an object and the closer they are together (i.e., the sun and the moon), the greater the gravitational attraction between them. Because the moon is closer to the Earth, the strength of the sun's gravitational effect on the Earth is about half that of the moon. Wherever the moon is in relation to the Earth, the ocean will be drawn towards the moon. A tide is essentially a wave, or *tidal bulge*, that originates in the ocean in response to the force exerted on the ocean by the gravitational pull of the moon and the sun. On the side of the Earth that is opposite to the moon, *inertia* tries to keep water in place, creating a second tidal bulge in order to counterbalance the gravitational pull of the moon.



Courtesy of NOAA

As the tidal bulges produced by this gravitational pull move towards and away from land, people are able to observe high and low tide. Just as the Earth revolves around the sun, a *solar day*, the moon revolves around the Earth, a *lunar day*. The main difference is that while the Earth takes an even 24 hours to rotate on its axis, the moon takes 50 minutes more than that to rotate around the Earth because the moon revolves in the same direction as the Earth spins on its axis. During this time, the Earth rotates through two high tides each day that are 12 hours and 25 minutes apart, therefore making the shift from high to low tide exactly six hours and 12.5 minutes each day. That is, of course, unless you live on the Gulf coast.

The Gulf of Mexico is a unique body of water relative to the greater ocean that exists beyond its nearly landlocked position. Given that the Gulf is so enclosed, with only relatively small openings between Florida and Cuba and Cuba and the Yucatan Peninsula, the Gulf has its own unique sets of tides that can be very difficult to predict. Further, the variation between high and low tide can be very minimal, at times rising no more than one foot in height, especially during the summer. The wind, rather than the sun and moon, becomes the most critical element in creating the tides in the Gulf of Mexico. Storms and hurricanes that move through the Gulf, even on its easternmost edge, can produce a tidal surge that can erode away part of the foredunes on Padre Island. During the winter months, cold fronts can bring strong, northern winds that also produce seasonally large winds that inundate the beach during high tide.

Whether it's a fishing, camping, or beachcombing trip that you desire, the tide can affect any trip to the beach at Padre Island National Seashore. Following a high tide, the beach is flat and compact, making for a great driving experience. Cold fronts and storm surges, tend to cause the tide to bring in all sorts of treasures, and fishermen will generally have a preferred time during which they fish based on the tides. Though we may not be able to set a watch to the tides on the Gulf coast, we can certainly stop to marvel at the water's edge and drift back to the memories of our favorite spot where the tide washed in and out, in and out...



# Lions and Tigers and SNAKES, Oh My!

Judy Stedronsky, Park Volunteer

WE REALLY DON'T HAVE LIONS (ALTHOUGH WE DID HAVE MOUNTAIN lions at one time) and tigers at Padre Island National Seashore, but we do have snakes. There are approximately 20 different species of snakes that have been identified in our park. Most of these snakes are harmless, but there are three species of rattlesnakes which are venomous. They are the Western Diamondback, Desert Massasagua, and Western Massasagua rattlesnakes. These, and the many other colorful, interesting, and harmless snakes, provide a valuable service as a part of the fragile balance of ecosystems in the park. They prey on small rodents, insects, birds, lizards, and frogs. In turn, snakes become food for larger snakes and predatory birds. Two of our harmless snakes, the Mexican Milk snake and the Texas Scarlet snake have coloring that resembles the venomous Coral snake. Coral snakes, however, have not been spotted on Padre Island.

Though we often tend to fear snakes, the truth is that snakes are in more danger from humans than humans are from snakes. As the human population increases, the alteration and/or loss of natural snake habitat due to commercial and residential human usage has significantly impacted snake populations. In fact, most snake populations appear to be on the decline. Many snakes are killed each year by vehicles as they cross streets and highways. Even so, snakes such as the Texas brown snake and the Lined snake are fairly common. Conversely, the beautiful Texas indigo snake is rarely seen. The Texas indigo snake, as well as other colorful and desirable snakes, are prized as pets and often fall victim to illegal collecting. Another event that may have contributed to this decline is the invasion of the imported red fire ants, which also live in the grasslands and dunes and can engulf the nests of egg-laying snakes.

Additionally, snakes are at the mercy of the challenging and changing weather conditions of the area. A drought condition, for instance, will affect the entire food chain with birds, reptiles, mammals and amphibians all vying for severely limited freshwater resources. During the drought of 2008-2009, snakes and other animals in the park were severely challenged as they searched for sources of freshwater.



Western Diamondback rattlesnake



Mexican Racer snake

Snakes, such as the Western Coach-whip snake and the Plains Blind snake, reside in the sand dunes. Other snakes, such as the Gulf Marsh snake and the Gulf Coast Ribbon snake enjoy marsh habitats, mud flats and other salt water estuaries. Both dunes and grasslands are home to the Texas Glossy snake, Mexican Racer snake, Great Plains Rat snake, and the rattlesnakes. For this reason, visitors are cautioned that climbing the dunes and hiking in the grasslands will put them in possible rattlesnake habitats.

Even in wintertime, when snakes are not as active, it is a good idea to tread carefully, especially on warm sunny days which may bring them out of hiding.

Since most snakes are good at staying out of sight, you may never get a chance to see one. If you do spot a snake, however, keep your distance. Take a picture if you'd like and then come visit us at the Malaquite Visitor Center. We have a flip-book with photos and descriptions of the snakes in our park, and our staff will be happy to answer questions and supply information on these fascinating animals.



Texas Lined snake

# A Look Inside the Park

Dimitra Guerrero, Staff Writer

AT FIRST GLANCE, YOU WILL NOTICE PADRE ISLAND NATIONAL SEASHORE seems to go on forever, as it is the longest stretch of undeveloped barrier island in the world. You will also see a variety of ecosystems, including rare coastal prairie, a complex and dynamic dune system, wind tidal flats teeming with life, and the Laguna Madre, one of the few hypersaline lagoon environments left in the world. And if you are one of the lucky ones, you may be witness to one of the rare, threatened, and endangered species that calls the National Seashore home!

But what you may not notice is the team of dedicated staff and volunteers working to protect you and the natural resources at the National Seashore. Upon entering the park, you probably met one of the rangers at the entrance station. This ranger works for the Division of Visitor and Resource Protection. The Division of Visitor and Resource Protection oversees a variety of programs and is responsible for enforcing laws, regulations and park rules, such as traffic and fishing regulations. Visitor and Resource Protection oversees physical security, Emergency Medical Services and collaborates with other divisions, such as Science and Resources Management on projects such as Wildland Fire Management.

The Division of Science and Resources Management also oversees a wide variety of projects. Science and Resources Management oversees much of the scientific research conducted in the park, environmental compliance, and the Oil and Gas Management Program. Additionally, this division conducts bird surveys, exotic species management, and works regularly with GIS.

Like Science and Resources Management, the Division of Sea Turtle Science and Recovery also utilizes GIS to track sea turtles. Sea Turtle Science and Recovery oversees research and protection of sea turtles such as the endangered Kemp's ridley sea turtle. Staff and volunteers working on the sea turtle project patrol the beaches, document and protect nesting and stranded sea turtles and recover eggs for incubation at the sea turtle lab's incubation facility. In fact, the beaches at Padre National Seashore will soon be buzzing with staff and volunteers diligently searching for nesting turtles.

Spring and summer are not only busy for Sea Turtle Science and Recovery, but it will also become increasingly busy for the Division of Interpretation. The Interpretation staff provides a variety of environmental and cultural programs to thousands of visitors and school age children. They also help get information to the public by updating the park's website, distributing brochures and newsletters, and talking to visitors at the Malaquite Visitor Center. In fact, they are the folks responsible for this issue of the *Gulf Breeze*!

A visit to the Visitor Center will bring attention to the new pavilion and the shade structures along the closed beach area. The construction and maintenance of these structures are the responsibility of the Division of Facility Management. Facility Management oversees the day to day maintenance of park facilities and campgrounds, park vehicles, and construction and rehabilitation of structures throughout the park. Facility Management crews remove hazardous materials from the beach and participate in public beach clean-ups.

The least visible division would be that of Administration. The Division of Administration is housed at the Park's Headquarters building and oversees human resources, budget, procurement, and information technology. They also provide guidance to project managers in these areas.

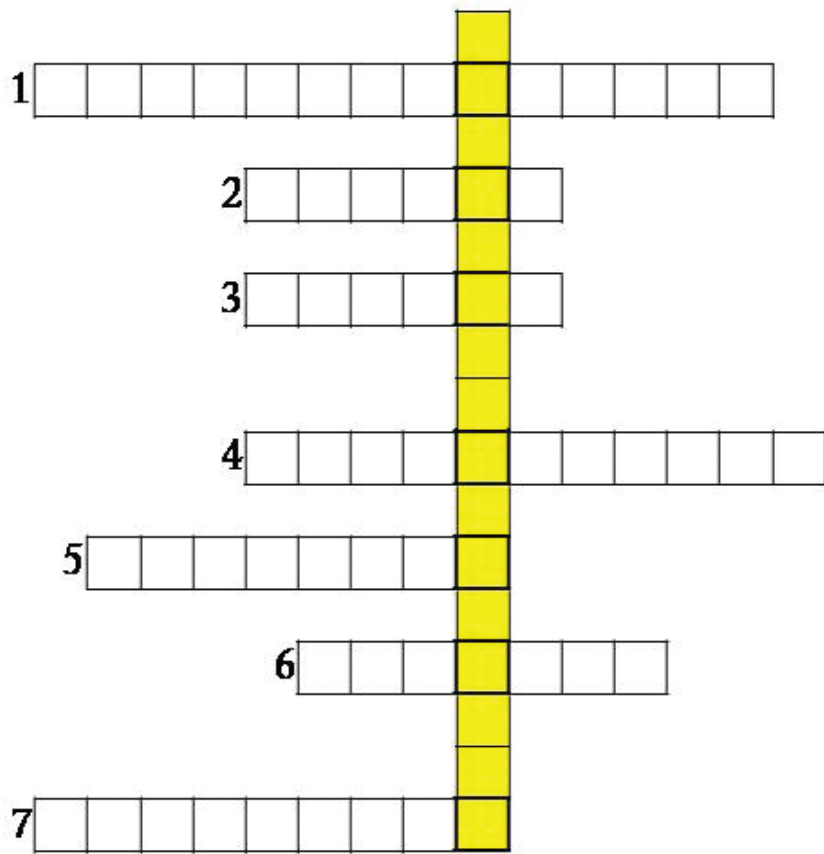
Although, many of the duties performed are the responsibility of specific divisions, there is considerable collaboration between divisions. For example, it is not uncommon for the Facility Management crew to team with a Multi-divisional team on activities such as beach clean-ups. While the facility management crew works with other division staff picking up trash alongside volunteers, the Interpretation team may register volunteers, educate the visitors and volunteers of the complications of pollution and marine debris. Additionally, employees from the various divisions make up a variety of committees to address matters such as recycling and safety.

So much of what one division does relies on the expertise and assistance from other divisions. It takes teamwork from all divisions to maintain a balance between park priorities and resources, both human and financial, to ensure a safe and satisfying park experience.

# Kids Corner

Suzy Evans, Park Ranger

After reading the articles in *The Gulf Breeze*, and filling in the boxes, you will get clues to help you discover a rattlesnake found at Padre Island National Seashore.



## Puzzle Clues:

1. A single-celled plankton (What Is That Mysterious Glow?)
2. A bird guide (Book Reviews)
3. An animal that died after eating dead fish (Red Tide)
4. Sea turtles that nest at Padre Island National Seashore (Spring 2010 Update on the Sea Turtle Program)
5. A plant that animals will not eat even if it is the only plant available (Recent Showers May Bring Wildflowers)
6. Pads of the prickly pear cactus (Showers Bring Wildflowers)
7. "Night light" (What Is That Mysterious Glow?)

Fill in the rest of the letters in the yellow boxes using the article Lions and Tigers and SNAKES, Oh My.



Western National Parks Association is a nonprofit cooperating association with the National Park Service. Headquartered in Tucson, Arizona, the Association was founded in 1938 as the Southwest Monuments Association to support the interpretive activities of the National Park Service.

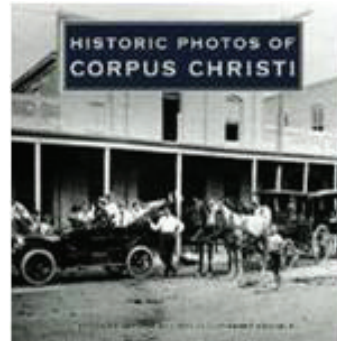
One of our founding goals was to create and publish park-related information unavailable elsewhere. Western National Parks Association promotes preservation of the National Park system and its resources by creating greater public appreciation through education, interpretation, and research.

Western National Parks Association Bookstore is located in the Malaquite Visitor Center. We have a wonderful and diverse selection of books. The visitor center hours are 9 a.m. to 5 p.m. Stop in and say hi! We would like to visit with you!

### Historic Photos of Corpus Christi

Written and captioned by Cecilia Gutierrez Venable

Retail \$39.95



*The following content was provided by the publisher:*

As a port city on the Gulf of Mexico since the 19th century, Corpus Christi has been an integral part of the fabric of United States history...Corpus Christi reflects both a diverse and progressive spirit, and the unique culture that contributed to the city's growth and prosperity.

With fact-filled photo captions and chapter introductions by Cecilia Venable, *Historic Photos of Corpus Christi* rediscovers the fascinating past of the "Sparkling City by the Sea" through nearly 200 rare photographs pulled from the Collections and Archives, Corpus Christi, Corpus Christi Public Libraries, Library of Congress, and Texas A & M University Special, showcased with exceptional clarity and beauty.

### The Sibley Field Guide to Birds of Eastern North America

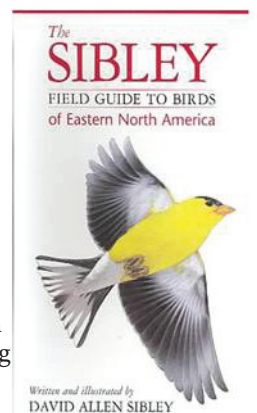
Written and illustrated by David Allen Sibley

Retail \$ 19.95

*The following content was provided by the publisher:*

The Sibley Guide to Birds has quickly become the new standard of excellence in bird identification guides, covering more than 810 North American birds in amazing detail.

Compact and comprehensive, this new guide features 650 bird species plus regional populations found east of the Rocky Mountains. Each entry contains new text concerning frequency, nesting, behavior, food and feeding, voice description, and key identification features. The Sibley Field Guide to Birds of Eastern North America is an indispensable resource for all birders seeking an authoritative and portable guide to the birds of the East.



## 20% Discount

When you check out at the Malaquite Visitor Center Bookstore, mention that you are a teacher or a homeschool educator and get a 20% discount on all of your educational purchases!  
<http://www.wnpa.org>

## Forget something?

During your recent visit to Padre Island National Seashore, did you check out our bookstore, but forgot your wallet or credit card? Check out the Western National Parks Association website to order your favorite publications and help support your parks. <http://www.wnpa.org>



# Health and Safety Tips

## Firearms Permitted in Padre Island National Seashore

As of February 22, 2010, a new federal law allows people who can legally possess firearms under federal, Texas and local laws to possess firearms in Padre Island National Seashore.

It is the visitor's responsibility to understand and comply with all applicable state, local, and federal firearms laws. Federal law prohibits firearms in certain facilities in this park; those places are posted with signs at public entrances. If you have questions, please visit our website at: [www.nps.gov/pais/](http://www.nps.gov/pais/).

## Swimming

Use caution when swimming and never swim alone. Strong currents flowing parallel to the beach, tides flowing to and from the beach, and sudden drop-offs in the surf can be dangerous for swimmers and waders alike. If caught in a rip tide, do not panic. Swim parallel to the beach until you are free from the flow, then swim to shore. Do not attempt to swim to shore against the flow. You will not make it.

## Do not feed wildlife

Feeding wildlife is prohibited by NPS policy and habituates the wildlife. Once habituated animals can become harmed by people, harm people, or harm other wildlife.

## Trash

Pack out your trash. Help the park by removing trash that you see on the beach.

## Hazardous materials

Hazardous materials periodically wash ashore and range from 55-gallon barrels containing unknown substances to used medical products. If you come upon hazardous materials, note the location and alert a park ranger.

## Metal detectors

Possession or use of metal detectors is prohibited in the park. Items such as seashells and driftwood, washed in by the tide, may be collected as long as the items are not used for commercial purposes. All other collecting is prohibited.

## Pets

Pets must be on a leash and under physical restraint at all times. Pets are not permitted at the Malaquite Visitor Center area, including the designated swim beach in front of the visitor center. Please clean up after your animals.

## Gray water and sewage

Gray water and sewage must be disposed of only at the dump station at Malaquite Campground.

## Driving

Beaches are Texas public highways. Only street legal and licensed vehicles may be driven in the park. All-terrain vehicles (ATVs), UTVs, go-carts, golf carts, and dune buggies are prohibited. Driving in dunes, grasslands, or mudflats is prohibited. Pedestrians have the right-of-way at all times and do not always watch for approaching vehicles. Drive with caution and strictly observe posted speed limits. On the beach, northbound traffic has the right of way.

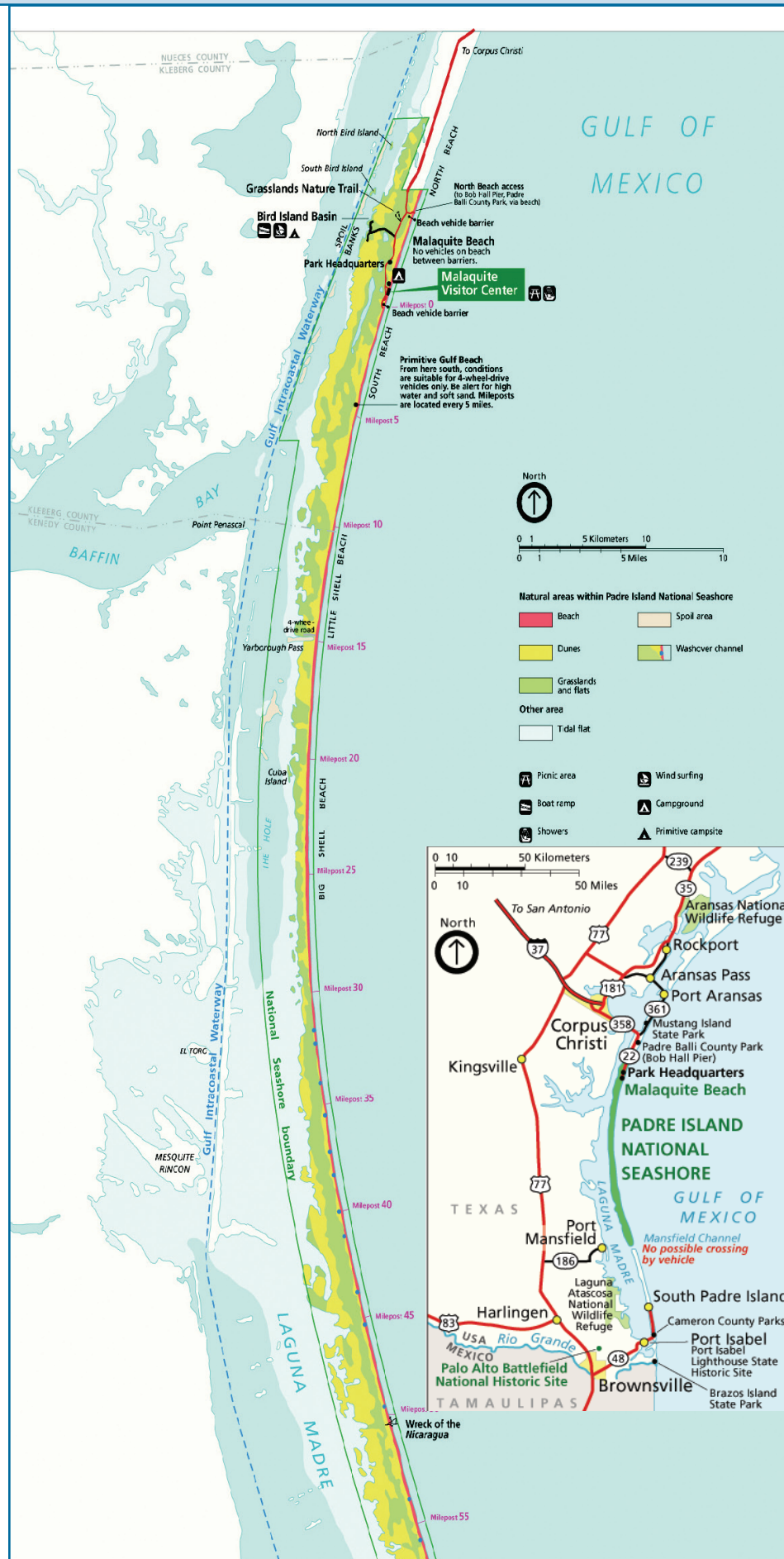
## Portuguese man-of-war, Stingrays, and Rattlesnakes

Watch out for these animals. The Portuguese man-of-war can cause a painful sting, which is usually accompanied by redness and some swelling of the affected skin area. Stingrays (bottom-dwellers), if stepped on or agitated, can inflict a puncture wound that can be extremely painful. Rattlesnakes live in the dunes, grasslands, and mudflats. Visitors should use extreme caution when walking in these areas. Get treatment at the Visitor Center.

## Hunting

Hunting is not permitted in the park, except for the taking of waterfowl in the Laguna Madre in accordance with applicable state and federal regulations. Transporting lawfully taken wildlife, including exotic species, through the park is prohibited, except for waterfowl and fish.

## Personal Water Craft (PWC), air boats, and kite surfing are prohibited.



## IN CASE OF MEDICAL EMERGENCY

If you have a medical emergency during your visit, contact a park ranger immediately or go to the Malaquite Visitor Center First Aid Station. If an employee is not immediately available, you may summon assistance for any emergency by dialing 911.

The closest hospital is Bay Area Medical Center, located at the corner of Hwy 358 (SPID) and Rodd Field Road in Corpus Christi. This facility is 24 miles from the visitor center.