

# The Smell of Marsh Mud: Matagorda Island National Wildlife Refuge

## Offering Multiple Options for Hands-on Study of an Ecosystem

by Karen Leggett

**A barrier island along the coastal bend of Texas that has no causeway, highway or ferry for access, Matagorda Island provides an unparalleled opportunity both to protect natural resources and offer the hands-on environmental educational experience that such an isolated ecosystem can offer.**

Hundreds are taking advantage each year as Aransas National Wildlife Refuge Complex uses the island as a key component of its environmental education program.

Many of the schools served by the refuge's education program are primarily Hispanic, and the students' first experience with the bay and the Gulf of Mexico often occurs during a field trip. "It is important that our future leaders understand the interdependence of the estuarine system and the need to protect it. It is through field trips and interaction that a true appreciation and understanding can develop," says Aransas Refuge environmental education specialist Tonya Nix.

The Science and Spanish Club Network – a group of middle school clubs connected to school districts and youth organizations – brings teens to Aransas Refuge, as does the Port Lavaca Water Watchers Club, which reaches primarily underserved urban Hispanic students.

### Estuary Education

Aransas Refuge has the largest wetland habitat in the northern part of the Mission-Aransas National Estuarine Research Reserve, a nationally designated complex of wetland, terrestrial and marine environments. One purpose of these reserves is to promote environmental education about estuaries.

*A young crane catches a blue crab at Aransas National Wildlife Refuge in Texas. Students learn the connections among water quality, blue crabs and cranes.*

While educational field trips have gone to Matagorda Island for decades, in 2008 Nix began meeting with other environmental education professionals, teachers and scientists from the University of Texas and Padre Island National Seashore to outline shared educational goals, including improved understanding of Texas coastal ecosystems and stewardship of coastal resources.

The goals are based on national science standards and aligned with Texas Essential Knowledge and Skills (TEKS) objectives. The group identified objectives and activities for each natural area that did not overlap. "We want visitors to have a unique experience at Matagorda Island, not something they can experience at Port Aransas or on boats that go into the bay," says Nix. Matagorda Island provides an opportunity to teach about the ecosystem of a barrier island.

### Getting to the Island and Staying There

When school, Scout or other groups come to Matagorda Island, they spend one or two nights in a rustic bunkhouse originally used by cowboys when the south end of the island was an active cattle ranch. There is no charge for the bunkhouse as long as it is being used for environmental education. Groups must bring their own bedding, toiletries, drinking water and food; the bunkhouse has a full kitchen, complete with cooking supplies. Energy comes from gas and solar panels.

Groups must also arrange their own transportation to the island on private charter boats. Nix says the students with the Port Lavaca Water Watchers Club save all year to pay for boats to bring them to the island. She says the refuge is considering seeking grants or

encouraging the Friends organization to hold fundraisers to defray some of the field trip expenses

The island has a small lab with locally gathered specimens, a few microscopes, plankton nets and viewers, and dissecting kits. Audio-visual equipment is available in a small classroom.

Melinda Nielsen, who brings fifth- and sixth-graders students from Bay Area Montessori School in Houston, says, "The venue is authentic and away from home, enabling students to investigate bay, marsh, coastal grassland, freshwater ponds, estuary and beach shore areas all at once to see how they are dependent on each other."

### From Goals on Paper to Hands-on Learning

When groups make plans for a Matagorda Island field trip, they choose from seven lesson plans, including a beach habitat mini-course and a beginning birding nature trek. Some plans existed prior to the Mission-Aransas Reserve collaboration. Others were adapted from The Nature Conservancy, which conducted programs on the island before it became part of the refuge. Nix teaches whichever lesson plan the group chooses.

The Matagorda Island experience is intended to teach students about the value of the estuary as a nursery for developing organisms and the importance of the island as a feeding source for migratory birds. Species are observed and studied in their natural habitats, allowing students to connect with nature while learning the importance of working together to insure the animals/habitats we have today are here for future generations.

Each lesson plan includes a goal, objective, recommended age group, time and season, as well as a very specific list of the TEKS objectives met by that plan. An eighth-grade TEKS requirement



Richard Gonzalez

*Cleaning up beach debris requires hard work and team work for students on Matagorda Island.*



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*Children learn to identify ghost crab tracks and burrows.*

## Beach Habitat Mini-Course

The objectives of this course are to give participants an understanding of the Gulf beach as an appealing but deceptively harsh habitat for resident biota. Other objectives include:

- Learn to perceive the ecological zones on the beach.
- Find and identify some characteristic animals that live in each zone.
- Observe and discuss the adaptations that permit survival on the beach and the food web that supports these resident creatures.
- Learn some ways that humans can disrupt the natural cycles on a beach.

**Site:** Gulf beach at Wynne Road

**Recommended length:** 2+ hrs

**Recommended age:** Grades 8-12 and adults

**Recommended season/time:** spring, summer, fall

### Materials provided by refuge (except for personal clothing items)

- Outside clothes with sleeves and long trousers to get wet to the knees; wet shoes; hat; sun block.
- four slurpers
- four plastic jars
- four plastic cubes
- two hand nets
- two hand magnifiers
- two 20-30 foot seines for the group
- two five-gallon buckets for the group
- thermometer
- refractometer
- megaphone
- group water jug
- First-aid kit with meat tenderizer
- 2-way radio

### Sample activities and questions

There are activities and questions related to several key wildlife species on the beach – tiger beetle, beach hopper, sand digger, palp worm, mole grubs and ghost crabs.

- Catch a tiger beetle in a plastic cube for observation. How does it tolerate sun and heat? How about swimmers and fishermen?
- Find coquinas, the small clams living in the swash zone. Note the sturdy, wedge-shaped shell adapted to the battering surf and shifting sand.

that could be met on Matagorda Island, for example, is for students to conduct field and laboratory investigations using safe, environmentally appropriate and ethical practices.

Another eighth-grade TEKS requirement is for students to learn about the interdependence among living systems. Aransas Refuge provides critical habitat for the endangered whooping crane, which depends on blue crabs as a food source. So students learn about the relationship between water quality and blue crabs. “If the water is too salty, blue crabs will not reproduce,” explains Nix. “Blue crabs, and therefore whooping cranes, are dependent on water quality”

### Inquiry Education

Nix guides students through each lesson with a process called inquiry education. When students are on the beach but before they have started digging for ghost crabs, they are asked to consider:

- What signs do you observe that tell us that a critter lives in the sand?
- What critters do you think may live on this beach? Why?
- How would living in a burrow be beneficial to survival on the beach?

Ghost crabs dig down to the water table. Students are asked to figure out

*Students with the Science and Spanish Club Network created their own “flash mob dance,” which they perform when Aransas Refuge has an exhibit at local wildlife festivals.*

the best place to dig to find ghost crabs. Ultimately, they begin digging close to the water. They are instructed to handle their ghost crabs with care when placing them into a jar and resuming the conversation.

- How does the crab survive on the beach?
- What special adaptations does the crab have to survive in this environment?
- Does the crab have natural camouflage?
- What would be the benefit of being nocturnal?
- How might continual automobile traffic affect ghost crabs populations?

Students observe a ghost crab with scientific precision – the hard exoskeleton, jointed legs, agile movements, special hairs to absorb water from burrow walls, gills that do not need constant immersion in water, pop-up eyes with near 360-degree visual field.

Ghost crabs feed mostly at night on coquinas and smaller crabs. They are preyed upon by birds, coyotes, badgers and feral hogs. After measuring the temperature of the surface and interior of a burrow, students talk about the advantage of being inside or outside the burrow on a hot day.

### **You're Invited to a Flash Flock Party**

Aransas Refuge frequently hosts teens in the Science and Spanish Club Network (SSCN), a multicultural environmental education project created by the Gulf of Mexico Foundation.

SSCN clubs first came to the mainland units of the refuge. Encouraged by Nix, they now come to Matagorda Island as well. Although Nix does use a beach ecology curriculum with these youngsters, they are more likely to learn about the estuarine ecosystem by working in it, doing service projects like beach cleanup. SSCN teens have



Richard Gonzalez

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**“You see the light go off in kids’ eyes when they get it. They are not out there trying to be cool. Marsh mud smells and they are getting wet and dirty while learning. By the time they leave, they still have a little Matagorda Island smell.”**  
**Tonya Nix**

rebuilt a trail beaten down by alligators, observed whooping crane habitat, and – in six visits between 2009 and 2011 – picked up more than 30 tons of trash from the Gulf coast shoreline.

In 2010, SSCN organized a Whooping Crane Flash Flock Party to celebrate both the refuge birthday and Tom Stehn, the refuge’s recently retired whooping crane biologist. Half the celebrants wore red, white and black while Stehn showed up in the whooping crane costume he used to work undercover with the cranes. SSCN teens created their own “flash mob dance,” which they now perform when Aransas Refuge has an exhibit at local wildlife festivals.

SSCN mentor and grant writer Richard Gonzalez planned a Whoop Dance Competition at the Aransas Pass Shrimporee in June 2012, when Aransas Refuge celebrated its 75th anniversary. He has also sent Flash Flock Party Kits to other national wildlife refuges with whooping cranes (Quivira in Kansas, Necedah in Wisconsin, Chassahowitza and St. Marks in Florida) as well as Wood Buffalo National Park in Canada, where the Aransas flock spends the summer. Both Quivira and St. Marks Refuges are making plans to have kids do The Whoop when the first cranes arrive at their refuges.

The Flash Flock Party Kit includes life-size wood cuts of cranes, smaller-than-life size blue crabs and ideas for creating an event that raises awareness about the endangered status of North America’s tallest bird, such as celebrating the day the cranes begin arriving or leaving, building on-site science displays, putting cranes on a parade float or establishing a wildlife biologist day. Gonzalez also believes The Whoop should be just the first of many endangered species theme songs and dances developed by students – he says he’s looking forward to the Kemp’s Ridley Sea Turtle Mambo, the Ocelot Trot or the Bison Bounce.

*For information on Whooping Crane Flash Flock Party Kits – or ideas on adapting the party to other species – contact Richard Gonzalez at [Richard@gulfmex.org](mailto:Richard@gulfmex.org).*