

Texas Shores



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Texas Sea Grant College Program

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**NURTURING
NATURE**

Tricolored heron wading in
the Laguna Madre near the
South Padre Island Birding
and Nature Center.
Photo © Seth Patterson.



ON THE COVER: Brown pelican.
Photo © Seth Patterson.

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Nurturing Nature Makes Dollars and Sense

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Dr. Donna Shaver, who has dedicated her career to the conservation and preservation of the Kemp's ridley sea turtle, celebrates their return to the Texas coast.



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AT TEXAS A&M UNIVERSITY

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sea notes

League City park demonstrates ways to be 'WaterSmart'

With help from Texas Sea Grant, the City of League City has transformed a public park into a showcase for the principles of WaterSmart landscapes: water conservation, water quality and habitat for wildlife.

The Texas Coastal Watershed Program (TCWP), a partnership between Texas Sea Grant and the Texas A&M AgriLife Extension Program, designed the new amenities at Ghirardi WaterSmart Park, which was funded by the city's Park Dedication Fund and a grant from the Texas Commission on Environmental Quality (TCEQ). The Galveston Bay Estuary Program was also a partner for the project.

"The TCEQ grant for Ghirardi WaterSmart Park gives the city and other area entities the opportunity to study, showcase and improve water management," says League City Mayor Tim Paulissen. "Water is one of our most valuable resources, and we are very excited about the opportunity to learn new and better ways to utilize and conserve that resource."

In addition to the pavilion, walking trails and playground typical of a public park, Ghirardi WaterSmart Park has several special features that highlight water issues, including a cistern that collects rainwater and feeds into a drip irrigation system.

"Recent drought years have served to remind all of us that water is precious," says Charriss York, Texas Sea Grant's Stormwater Extension Program Specialist. "Collecting and using rainwater for irrigation instead of turning on the hose, using native plants that are adapted to our unique climate, and having more native areas and less lawn are all water conservation strategies that are used in the park."

Most of the bays and creeks in the Houston area have degraded water quality as a result of everyday urban activity; the park uses low areas of land called swales and rain gardens, which resemble regular flowerbeds, to collect and filter water, breaking down pollutants by using the natural microbes in the soil. The pavilion has a "green roof," a roof with living plants that reduces the amount of impervious surface — rooftops and materials used for most streets and parking lots that block rainwater from reaching the soil and increase rainwater runoff and runoff pollution.

As the Houston area's expanding development decreases open areas, wildlife like butterflies, dragonflies, hummingbirds and songbirds find it more difficult to locate food, water, shelter and places to raise their young. By using native plants in the flowerbeds and rain garden, leaving as many of the existing trees as possible, and providing access to open water sources, the park provides habitat for these species.

TCWP is also using the park as a living laboratory and will continue to monitor the effectiveness of the stormwater management features installed at the park.



TEXAS SEA GRANT PHOTO

Rain gardens use native plants to collect and filter rainwater and to provide wildlife habitat.



TEXAS SEA GRANT PHOTO

The green roof on the park's pavilion uses live plants to reduce the amount of impervious surface, decreasing rainwater runoff and runoff pollution.

"Many of the features we installed are common in other parts of the world but not in coastal Texas, so we are using this park to study them in our unique soils and climate so we have real data, real numbers, that quantify the benefits of things like rain gardens and swales," York says. "This is research that can help communities like League City make more informed decisions when they are writing ordinances and making decisions about the future of the community."

The park is located at 1810 Louisiana Street in League City.

— Cindie Powell

Calhoun County restoration project receives funding

One of the sites listed in an inventory of potential locations on the Texas coast for hydrological restoration has been approved for funding by the National Oceanic and Atmospheric Administration's (NOAA) Restoration Center.

The Magnolia Inlet to Indianola in Calhoun County is a large marsh complex that is suffering because of a lack of tidal flow. The restricted flow, caused by multiple man-made barriers on the edges of the marsh, has made the marsh saltier than the Gulf of Mexico. This hypersalinity has led to fish kills, dying vegetation and the erosion of the marsh.

Dr. Rusty Feagin, Associate Professor in the Department of Ecosystem Science and Management at Texas A&M University, is in the early stages of restoring these wetlands. Two barriers, Magnolia Inlet and Fish Pass, will be removed using the NOAA funding. Both have sediment build-up that is blocking the tidal flow from entering the marsh complex. By removing both barriers, it will allow at least 250 acres of the system to be flushed out; the salinity is expected to drop almost immediately and fish will start returning to the area.

"Removing barriers to tidal hydrology is a very cost-effective and impactful way to restore a large area fast," Feagin says.

To complete additional stages of the restoration, Feagin has received funding from the Texas General Land Office's (GLO) Coastal Management Program, Texas A&M AgriLife



PHOTO BY THOMAS HUFF

Audra Hinson, a doctoral student at Texas A&M University, catches a small fish while monitoring conditions for the restoration effort at Fish Pass and Magnolia Inlet.

Research, and GLO's Coastal Erosion Planning and Response Act program. Calhoun County and a private landowner are also contributing to the restoration effort.

The Magnolia Inlet project is one of 19 Texas projects listed in a Gulf-wide Hydrological Restoration Projects Inventory. A joint effort between NOAA's Restoration Center and the Gulf of Mexico Sea Grant Programs, the inventory was initiated to locate restoration projects that "remove or modify anthropogenic barriers to restore historic tidal estuarine and freshwater exchange to benefit coastal and marine fisheries habitat." The projects must restore at least five acres and have a budget of less than \$5 million and a lifespan of 20 years or more.

— Karla Dunlap

Corpus Christi recognized as leader in climate planning

The Gulf of Mexico Climate Outreach Community of Practice recognized the City of Corpus Christi for its leadership in planning for climate change with a 2014 Gulf of Mexico Spirit of Community Award.

"The creation of Corpus Christi's Integrated Community Sustainability Plan was a data-driven process conducted by an interdisciplinary team with input from city decision makers and community stakeholders at every step," says Heather Wade, Coastal Planning Specialist with Texas Sea Grant. "It generated implementation recommendations on topics from climate to urban agriculture to bicycle trails in the form of action items that range from no-cost community-based activities to major capital improvements to the city."

Corpus Christi participates in other resilience activities through Texas Sea Grant, the Mission-Aransas National Estuarine Research Reserve and the Texas Nature Conservancy. The city also has a presence at public events and aims to educate the public on issues related to climate, such as coastal hazards, drought and water conservation.

The Gulf of Mexico Climate Outreach Community of Practice was formed by the National Oceanic and Atmospheric Administration's Gulf of Mexico Regional Collaboration Team and the four Gulf of Mexico Sea Grant Programs. It is a group of more than 400 education, outreach and extension professionals, as well as community leaders and planners, who work together to learn how coastal communities can adapt and become more resilient to sea-level rise, precipitation changes and other climate-related issues.

— from *Mississippi/Alabama Sea Grant Consortium*

Texas Sea Grant receives \$99,000 grant to launch pilot TED training program, help fishermen gain access to important markets

Texas Sea Grant has embarked on a pilot program to make it easier for consumers to know if wild-caught Gulf shrimp at their local supermarket is “turtle-safe.”

Funded by a recent \$99,000 grant from the National Fish and Wildlife Foundation (NFWF), Texas Sea Grant’s Marine Fisheries Specialist, Gary Graham, is leading an effort to train shrimp fishermen to correctly install and operate federally mandated equipment designed to ensure sea turtles are excluded from the harvest.

“This program will help the fishing industry by providing necessary training on turtle excluder device compliance that the large suppliers are asking industry to provide,” says Dr. Pamela Plotkin, Director of Texas Sea Grant.

Working one-on-one with shrimp fishermen throughout the Gulf of Mexico, Graham and Texas Sea Grant’s Cameron County Coastal and Marine Resources Agent, Tony Reisinger, have been reviewing the federal requirements with fishermen and inspecting trawl gear to ensure that vessels’ turtle excluder devices (TEDs), which allow sea turtles to escape from trawl nets, are built, installed and being operated properly. TEDs are the most effective way to reduce capture and mortality of sea turtles in otter trawls, the primary gear used to harvest shrimp in the Gulf of Mexico, but even slight errors in the angle of the TED as it is set within the net can result in sea turtle capture — and a finding of non-compliance if the vessel is boarded by federal authorities.

For vessels whose gear is not totally in compliance, Graham and Reisinger are suggesting modifications and re-evaluating the vessel once the modifications have been made. Certified vessels will also be re-evaluated a year later to ensure they are still in compliance.

The NFWF grant is aimed at helping to maintain populations of the loggerhead turtle found in the northwest Atlantic, including in the Gulf of Mexico, where its potential for decline is particularly high due in large part to incidental capture in commercial fisheries and small-scale subsistence fishing. Loggerheads are the species most likely to be captured during shrimp fishing, and the season for the fishery overlaps with the sea turtle’s presence in the fishing grounds.

Graham and Reisinger are also continuing their work on a project funded by the National Oceanic and Atmospheric Administration’s Fisheries Service to test prototype designs of bycatch reduction devices (BRDs). Bycatch is the term used to describe non-targeted species caught and usually discarded during commercial and recreational fishing; BRDs are equipment placed in trawl nets to allow non-target marine animals to escape the nets.

Federal regulations require commercial shrimp fishermen to use BRDs to reduce impacts on other species, but the devices also allow shrimp to escape the nets. Some models currently in use can reduce the shrimp catch by 10 percent or more, and shrimp lost from the net equals money lost for the fisherman. Modified BRD designs or new models that would reduce



Texas Shrimp Association Executive Director Andrea Hance measures a turtle excluder device angle under the tutelage of Gary Graham, Texas Sea Grant’s Marine Fisheries Specialist.

TEXAS SEA GRANT PHOTO

shrimp losses or are easier or less expensive to install must go through lengthy and expensive federal testing before being approved for use.

Graham and Reisinger spent more than a month on the *Miss Madeline*, a working shrimp boat, in the offshore waters of Texas and Louisiana to conduct proof-of-concept testing on BRD prototypes to determine which were the best candidates for future in-depth evaluations for federal certification. “We’re trying to make the testing process more efficient,” Graham says. “It costs a lot of money to go through the federal testing process, and it would be beneficial if we could be more certain that gear submitted for certification are good candidates to be approved.”

— Cindie Powell

Summer camp educates Texas teens about maritime jobs

High school students on the upper Texas Gulf coast can get a first-hand look at maritime careers in their own backyard, thanks to a summer program run by the Port of Port Arthur.

Texas Sea Grant is a partner in Camp SeaPort, the brainchild of Port Commissioner Linda Turner Spears, who recognized that while existing career outreach programs in the area focused on other major sectors of the local economy, the petrochemical and service industries, they did little to promote maritime job opportunities. With the support of the other Port Commissioners and the Port of Port Arthur, the camp was launched in 2008.

While the port has remained economically stable through the most recent economic downturn, the community of Port Arthur faces a 15 percent unemployment rate, decreasing high school graduation rates and a declining population. Camp SeaPort's aim is to encourage young people to stay in the community after they graduate from high school. The week-long July camp is open to students in grades 8 through 12, is free of charge, and also provides the participants with meals and a stipend.

"It's an outreach opportunity for our local community, not just for at-risk kids, but all youth in our area," says Deputy Port Director Larry Kelley. "We want them to see that there are many, many jobs, and you don't have to go to sea for a month at a time, there are a lot of land-side jobs, too."

The teens interact with a wide range of maritime professionals, all of whom volunteer their time. Kelley says that while no two years are the same, past groups

have met with tug boat and barge operators, listened to presentations from the local pilots' association, visited working shipyards and all the area's ports, been introduced to maritime programs at nearby universities, and spent time aboard U.S. Coast Guard vessels and at the Coast Guard Marine Safety Unit to learn about the skills needed for the different positions there.

He says the students are shown the vital role of a port as the nexus of multi-modal transfers — ship to barge, ship to truck, ship to rail, and vice versa — and the complicated logistics involved in moving cargo through the port.

"We hope that, after the camp is over, the students have a fundamental understanding of how the transportation system works in our area, and how dependent our region, state and national economy are on marine transportation."

Terrie Looney, Texas Sea Grant's Jefferson and Chambers County Coastal and Marine Resources Agent, is a co-director of the program. She developed the marine science curriculum, helps with program logistics, and provides the activities for one day of the program, when the students board a waterborne education vessel and take an ecological tour of the Trinity River with hands-on activities to learn about coastal resource management.

"Most of the careers have specialized training, but many can bring the kids on pretty much out of high school," Looney says. "The students learn that they don't have to leave the area to find good-paying jobs."

— Cindie Powell



While touring a U.S. Coast Guard vessel, Camp SeaPort students learn about navigation and the operations in the wheelhouse.



Four camp participants ride a Coast Guard response boat on the Sabine-Neches intercoastal waterway. For some students, Camp SeaPort is their first time aboard a boat.



Texas Sea Grant's Terrie Looney, second from left, leads students on a seining activity on the Trinity Bay marsh to teach them about the local ecology and some of the science behind maritime issues.

Texas nominee selected for marine policy fellowship in Washington, D.C.

Doctoral student Kaitlyn Schroeder-Spain will travel to Washington, D.C., next year as a 2015 John A. Knauss Marine Policy Fellow.

Texas Sea Grant nominated her for the prestigious National Oceanic and Atmospheric Administration (NOAA) fellowship. In November, she and other Knauss Fellows will attend a series of interviews in Washington to be matched with an executive branch agency or Congressional office, where they will spend the year-long fellowship that will begin in February 2015.

Schroeder-Spain, a Texas native, will earn her doctorate in coastal and marine system sciences from Texas A&M University in Corpus Christi (TAMUCC). Her research focuses on marine ecotoxicology. She is currently investigating the effects on blue crab, an ecologically and commercially important species, of several common toxicants used to eradicate insects that transmit diseases. Before attending TAMUCC, she received a bachelor of science degree in biology from The University of North Texas in Denton.

“I want a career that revolves around science and requires me to keep learning and solve problems, and until recently, that always translated into academia,” Schroeder-Spain says. “There are many talented scientists publishing policy-relevant research, but there seems to be a deficiency of scientists that have the time, or desire, to track how science influences public policy. It also seems that some research may be overlooked or missed, and I want to understand why and help improve the communication between scientists and policy-makers.”

Sponsored by the National Sea Grant College Program, the Knauss Fellowship provides a unique educational experience to graduate students interested in ocean, coastal and Great Lakes resources and in the national policy decisions affecting those resources. It is named after one of Sea Grant’s founders, former NOAA Administrator John A. Knauss. Participants are nominated by one of the 33 Sea Grant programs in the coastal and Great Lakes states and territories.

Texas Sea Grant’s 2014 Knauss Fellow, Kimberly Bittler, is currently at the Bureau of Safety and Environmental Enforcement (BSEE), an agency within the Department of the Interior. BSEE is evaluating new and emerging technologies for the offshore oil and gas industry and working to mitigate risks associated with the human element of offshore operations.



Kaitlyn Schroeder-Spain



Kimberly Bittler

Bittler, who completed her master of science in marine science in 2013 from The University of Texas at Austin, is a Research Coordinator at BSEE, where she works with the research arm of the agency and acts as a liaison between research groups and strategic engagement programs. She also works on National Ocean Policy (NOP), which includes identifying actions implementing NOP and coordinating and drafting reports on BSEE’s accomplishments.

“The research done at BSEE improves safety offshore and protects the environment by minimizing the risk of oil spills, such as through technology barriers, and ensuring the development of effective tools and technologies to respond to an oil spill, should one occur,” Bittler says. “Sharing BSEE’s research internationally facilitates the development of benchmarking, and increases the knowledge of the global industry, thus making operations safer everywhere. BSEE also coordinates with other agencies to help create a predictable regulatory environment that protects workers and the environment.”

Past Texas Sea Grant-nominated Knauss Fellows have also worked in Congressional offices and in departments within NOAA, the National Aeronautics and Space Administration and the National Science Foundation. Since its inception in 1979, 54 Texas nominees have participated in the fellowship program.

— Dr. Mona Behl

Texas Sea Grant-funded rip current project has international applications



PHOTO BY DR. CHRIS HOUSER

Graduate students receive funds for research projects

Texas Sea Grant this year awarded \$29,000 in research funding to 21 graduate students at three Texas universities to support their research.

The funding comes from Texas Sea Grant's Grants-in-Aid of Graduate Research Program, which is intended to promote scientific excellence and achievement by providing small grants to graduate students enrolled at Texas A&M University (TAMU), Texas A&M University at Galveston (TAMUG) or Texas A&M University-Corpus Christi (TAMUCC) whose marine- or coastal-related research in any field of study is relevant to Texas, though not necessarily based in Texas. This is the second year of the program.

"Supporting graduate students as they are learning how to develop and test hypotheses, collect and analyze data, and communicate their findings is important to Texas Sea Grant because it contributes to workforce development and training of these early career researchers," says Dr. Pamela Plotkin, Texas Sea Grant Director. "This program also provides the students with hands-on experience finding funding, writing competitive grant proposals, navigating the peer-review process and conducting funded research within a timeline and budget — important professional skills that are not covered in the classroom."

After a rigorous peer review process, 21 graduate students were awarded grants ranging from \$1,000 to \$2,000 to be applied to expenses directly related to a student's thesis work, such as fieldwork, laboratory analysis and purchase of testing materials. The proposals were evaluated based on the students' academic and employment histories, the intellectual merits and broader impacts of their proposals, and the students' statements of career goals and reference letters.

Eight students received \$2,000 grants. The names of the students, along with their affiliation and the graduate degrees that they seek, are David Brankovits, TAMUG, Marine Biology, doctoral candidate; Emily Cara, TAMUCC, Life Sciences, doctoral candidate; Anne Marie Gavlas, TAMUCC, Life Sciences, master's candidate; Christopher Hollenbeck, TAMUCC, Marine Genomics, doctoral candidate; Erin Mattson, TAMUG, Marine Biology, master's candidate; Ryan Rezek, TAMUCC, Life Sciences, doctoral candidate; Matthew Streich, TAMUCC, Marine Biology, doctoral candidate; and Allison Wilkes, TAMU, Biology, doctoral candidate.

Another 13 students received \$1,000 grants. They are Mohammad Almukaimi, TAMUG, Oceanography, doctoral

candidate; Joshua Cullen, TAMUG, Wildlife and Fisheries Sciences, doctoral candidate; Lauren Gorski, TAMUCC, Marine Biology, doctoral candidate; Chien Hsiang, TAMUCC, Life Sciences, doctoral candidate; Riaz Khan, TAMUCC, Physical and Environmental Science, doctoral candidate; Luz Angela Lopez De Mesa Agudelo, TAMUCC, Marine Biology, doctoral candidate; Melinda Martinez, TAMUCC, Marine Biology, master's candidate; Kathryn Mendenhall, TAMUCC, Life Sciences, master's candidate; Dara Orbach, TAMUG, Marine Biology, doctoral candidate; Avery Schrer, TAMUCC, Marine Biology, doctoral candidate; Jason Selwyn, TAMUCC, Marine Biology, master's candidate; Bradley Weymer, TAMU, Geology and Geophysics, doctoral candidate; and Kevin Wolfe, TAMUCC, Marine Biology, doctoral candidate.

More information about the Grants-in-Aid of Graduate Research Program is available by contacting Dr. Mona Behl, Texas Sea Grant's Research Coordinator, at monabehl@tamu.edu or (979) 458-0449, or on the Texas Sea Grant website at <http://TexasSeaGrant.org/funding>.

— Dr. Mona Behl

Texas A&M University Department of Geography researchers Drs. Chris Houser and Christian Brannstrom used a version of a survey, which they developed for a Texas Sea Grant-funded project to study the rip current knowledge of visitors to Galveston and North Padre Island beaches, as part of the course requirements for a group of 14 undergraduate students they took to Costa Rica on a faculty-led study abroad program in July. The students collected responses from 60 English-speaking beach visitors at *Playa Jaco* and *Playa Cocles*, and the researchers' local collaborators translated the survey for use with Spanish-speaking beach users. It is estimated that 30 percent of the 150 drowning deaths each year on Costa Rican beaches are caused by rip currents.



Texas A&M University undergraduate students survey visitors to the beach.

PHOTO BY DR. CHRIS HOUSER

Texas Sea Grant brings Gulf of Mexico to K-12 classrooms

As part of its Brazos Valley Ocean Awareness Program, Texas Sea Grant has launched a program for schools in Bryan and College Station to adopt a saltwater aquarium for classrooms and support the schools' ocean science curriculum.

Through the Aglantis Adopt-A-Tank program, up to 20 of the 30-gallon BioCube aquariums will be placed in local K-12 public and private schools each year. "This program is part of our outreach efforts, sponsored by the Texas A&M Provost's Office, to promote ocean awareness in the Brazos Valley and to help students learn about and appreciate the Gulf of Mexico and the world's oceans," says Rhonda Patterson, Texas Sea Grant's Outreach Specialist.

Dubbed "Aglantis Jr." after the 300-gallon saltwater aquarium that the program installed in the Texas A&M University Memorial Student Center last year, the tanks come equipped with the basic supplies needed to maintain the aquarium for six months, plus invertebrate animals native to the Gulf of Mexico and the Caribbean, including starfish, urchins, snails and hermit crabs. Patterson, assisted by university students, sets up the tanks and provides troubleshooting assistance as needed. The schools can add fish and additional invertebrates to the tanks after they are set up.

Since the program began earlier this year, Texas Sea Grant staff have set up the aquariums in 18 local schools in the area and also at the Texas School for the Deaf in Austin. Another of the BioCube tanks has also been placed in the George Bush Presidential Library and Museum to showcase Gulf of Mexico species as part of an exhibit on "Offshore Drilling: The Promise of Discovery," set to run through February 1, 2015.

The marine life in the main Aglantis aquarium can be viewed live via streaming video from the Texas Sea Grant website at <http://texasseagrant.org/programs/aglantis/>.

— Cindie Powell



Students at South Knoll Elementary School in College Station with their new Aglantis Jr. aquarium.

TEXAS SEA GRANT PHOTO



The main Aglantis aquarium in Texas A&M University's Memorial Student Center helps the campus community learn about the Gulf of Mexico and the world's oceans.

TEXAS SEA GRANT PHOTO

Kudos

Several Texas Sea Grant staff members have been recognized for their contributions to the Texas coast this year:

Dr. Pamela Plotkin, Director, was named a 2014 "Harte's Hero" by the Harte Research Institute for Gulf of Mexico Studies for her work furthering the recovery of the Kemp's ridley sea turtle.

Julie Massey, Galveston County Coastal and Marine Resources Agent, received a Superior Service Award from Texas A&M AgriLife Extension for her leadership, support and guidance of volunteers involved in education, training and restoration activities.

Gary Graham, Marine Fisheries Specialist, was honored with the Gene Raffield Humanitarian Award from the Southeast Fisheries Association for his devotion to educating commercial fishermen, demonstration of leadership, and support of fishing communities.

Texas team wins award at national Ocean Science competition

PHOTO COURTESY AMANDA SEBESTA



Dolphin Challenge champions Langham Creek High School, winners of the James D. Watkins Sportsmanship Award at the 2014 National Ocean Sciences Bowl competition in Seattle, Wash. Pictured are, from left, team members Malek Williams, Jaffar Syed, Amanda Fontenot, Madison Selldin, Aleeya Ali, Coach Amanda Sebesta, and Texas NOSB Regional Coordinator Terrie Looney.

As high school students around Texas are training for two upcoming regional National Ocean Sciences Bowl competitions early next year, one team from Houston has bragging rights from the 2014 national competition.

Volunteer officials at the national competition in Seattle, Wash., in May voted to present the James D. Watkins Sportsmanship Award, which recognizes the team that best embodies the spirit of earnest competition while demonstrating exemplary decorum, to the students from Langham Creek High School: Aleeya Ali, Amanda Fontenot, Madison Selldin, Jaffar Syed and Malek Williams. The team, coached by Amanda Sebesta, won the 2014 Dolphin Challenge, the regional NOSB competition held at Texas A&M University at Galveston, to advance to the national competition.

“This is the second year in a row that a Texas team has demonstrated the best of Southern manners. In addition, Langham

Creek raised the most money for the NOSB ‘Get in the Game’ fundraising campaign,” says Terrie Looney, NOSB regional coordinator. “I had the pleasure of traveling home with the team. During our 10-hour journey through airports, they were a real pleasure to be around.”

Looney is the Coastal and Marine Resources Agent for Jefferson and Chambers counties for Texas Sea Grant, which hosts both Texas regional competitions, the Dolphin Challenge in northern Texas and the Loggerhead Challenge for teams from the southern part of the state.

Austin’s Chaparral Star Academy, the winners of the 2014 Loggerhead Challenge, which was held at The University of Texas Marine Science Institute in Port Aransas, took sixth place at the national competition. The team — Kimberly Brockhausen, Randi Cannon, Alex Clarke, Eric Clinch and Brady Romero — was coached by Kris Barnett, with Allyson Fox serving as assistant coach.



TEXAS SEA GRANT PHOTO

Chaparral Star Academy’s Team “A,” winners of the 2014 Loggerhead Challenge. From left are Coach Kris Barnett, Randi Cannon, Brady Romero, Alex Clarke, Kimberly Brockhausen, Eric Clinch and Assistant Coach Alysson Fox.

NOSB is a quiz bowl-style competition, in which students answer questions in all disciplines of the ocean sciences: biology, chemistry, physics, geology, geography and the social sciences. It is managed nationally by the Consortium for Ocean Leadership, a nonprofit organization based in Washington, D.C. NOSB is designed to encourage and support the next generation of marine scientists, policy makers, teachers, explorers, researchers, technicians and informed citizens to be stewards of the ocean. In 2014, about 2,000 students from more than 300 high schools participated, and 22 regional winners from around the country competed at the national finals.

The 2015 Loggerhead Challenge will be held February 7, with the Dolphin Challenge on February 28. The national competition will be April 23-26 in Ocean Springs, Miss.

— Cindie Powell

John Jacob, Coastal Community Development and Environmental Quality Specialist, received the Southern Region Excellence in Extension Award by the Association of Public and Land-Grant Universities for his work to address urgent and emerging urban development issues.

Marissa Sipocz, Wetland Program Coordinator, and her partners were named a Finalist of the Texas Environmental Excellence Awards in the Civic/Community category for their Sheldon Lake Prairie Wetland Restoration Project.

Charriss York, Stormwater Projects Coordinator, was selected as one of the Galveston County Health District’s Outstanding Public Health Partners for her coordination efforts in the Dickinson Bayou Watershed Partnership.

Specialist Haby retires

TEXAS SEA GRANT PHOTO



Mike Haby with Dr. Pamela Plotkin, Texas Sea Grant Director, at a celebration for his retirement in late April.

After taking a partial retirement last August, Texas Sea Grant Extension's Seafood Marketing Specialist Mike Haby took full retirement in April 2014 after a distinguished career with the program that spanned more than three decades.

After graduating from Texas A&M University (TAMU) with a bachelor's degree in Marketing, he began his Sea Grant career with the New York program in 1978 on a one-year appointment dealing with seafood business issues and moved to Virginia Sea Grant in 1979 as an area agent. Haby returned to Texas to join Texas Sea Grant in 1982, the same year he received his master's degree in Marine Resources Management from TAMU. His Extension position was a partnership between Texas Sea Grant and the Texas A&M AgriLife Extension Service; his titles also included a faculty appointment as Professor in TAMU's Department of Agricultural Economics.

Haby focused on applied research to solve seafood industry problems and outreach to the industry provide them with the latest information. His career included work that began in 2003 to enable the Texas shrimp industry to participate in the U.S. Department of Agriculture's Trade Adjustment Assistance (TAA), the first assistance program at the agency that gave commercial fishermen standing to apply for economic and education/training benefits. When the program was redesigned in 2009, Haby led the preparation of an eight-state regional petition for shrimp fishermen that was one of only three approved and made it possible for more than 4,500 shrimp fishermen and women from North Carolina to Texas to meet program requirements and receive more than \$44 million in assistance to date.

With his Sea Grant colleagues, he also conducted cooperative research with shrimp producers to study the reductions in fuel consumption and production costs from new shrimp trawl gear, saving the shrimp fleet millions of dollars; worked with the nation's grocery industry to create and communicate research-based handling procedures to increase profitability and seafood safety; and trained food processors and state and federal regulators in Hazard Analysis Critical Control Point (HACCP) principles and their application.

He was the recipient of Texas A&M AgriLife Extension Superior Service Awards in 2000, 2004 and 2013; a National Sea Grant College Program Superior Outreach Programming Award in 2010; Texas A&M University System Vice Chancellor's Awards in Excellence in 2002 and 2005; and a Regional Sea Grant Superior Outreach Programming Award in 2005.

— Cindie Powell

New extension staffers bring expertise to coast

Texas Sea Grant has added five new extension staff members, all of them located on the coast.



Joshua Gunn

New Extension Program Leader **Joshua Gunn**, who joined the program at the end of April, has a background in coastal community outreach and hazard resiliency and recovery.

His office is

located at Texas A&M University at Galveston (TAMUG), where he will build relationships between Texas Sea Grant and research institutes including TAMUG's Center for Texas Beaches and Shores and the Institute for Sustainable Coastal Communities.

Gunn completed a master of marine resource management degree with a focus in coastal environmental planning from TAMUG in 2010 while also serving as a Boatswains Mate with the U.S. Coast Guard. He returned to Texas after two years with Michigan Sea Grant as an extension educator, where he worked with coastal communities and businesses in southeastern Michigan to address sustainable coastal development, climate change adaptation and environmental hazards in the Great Lakes. He is currently completing a Ph.D. in urban and regional sciences from Texas A&M University; his dissertation investigates urban patterns and flood damage in Texas coastal watersheds.

"The work I saw being done at Texas Sea Grant during my graduate career at Texas A&M made me realize that I wanted to be a part of Sea Grant's mission," he says. As Extension Program Leader, Gunn supervises the program's county coastal and marine resources agents and extension specialists, including three who joined Texas Sea Grant in August.



Dr. Stuart Carlton

Dr. Stuart Carlton is the program's Healthy Coastal Ecosystems/Social Science Specialist. He started in the newly created position on August 18, and his office is also located on the TAMUG campus. Carlton holds a bachelor of arts in English with a minor in ecology, evolution and organismal biology from Tulane University, a master of science in fisheries biology from the University of Georgia, and a Ph.D. in interdisciplinary ecology from the University of Florida. His primary research interests are the human dimensions of climate change, natural resource controversies, and rare and imperiled species. He most recently served as a postdoctoral research assistant in the Natural Resources Social Science Laboratory at Purdue University and also worked for two years at Florida Sea Grant as a Program Assistant.



Christine Hale

Christine Hale, the Oil Spill Outreach Coordinator, is also filling a brand-new position at Texas Sea Grant and is working from the Texas A&M University-Corpus Christi (TAMUCC) campus. She came to the program August 11 from the University of the Virgin Islands Sea Grant, where she was an Extension Specialist and Stewardship

Coordinator. Her activities included building public support to address "Ridge to Reef" or whole-ecosystem issues. She has a bachelor of science in marine science from Millersville University of Pennsylvania and a master of science in marine and environmental science from the University of the Virgin Islands.

Hale's is one of four oil spill science specialist positions recently created by the Gulf of Mexico Sea Grant programs as part of a new oil spill science education project. Each of the four specialists are located in a different state but will work regionally as a team to conduct workshops in coastal communities to share the results of oil spill research and produce oil spill-related publications and press reports. The collaborative project is funded by a grant from the Gulf of Mexico Research Initiative (GOMRI), an independent organization created in 2010 with funds from BP to support oil spill research in the Gulf. Texas Sea Grant received \$288,000 from GOMRI over a two-year period for its portion of the Gulf Sea Grant oil spill education project. If the project goes well, the initial two-year grant can be renewed for up to 10 years.



Dr. Andrew Ropicki

Dr. Andrew Ropicki, who started August 1 as the Marine Economics Extension Specialist and Assistant Professor in Texas A&M University's Department of Agricultural Economics, has offices on the TAMUCC campus and also at the Texas A&M AgriLife Extension Program in Corpus Christi. Ropicki fills the Marine Economics Specialist position most recently held by Mike Haby, who retired in April. Ropicki received bachelor of science and master of science degrees in finance and a second master's degree and Ph.D. in food and resource economics, all from the University of Florida (UF). He most recently worked as a Research Assistant in the Food and Resource Economics Department at UF. His research interests include the evaluation of rights-based fisheries management, the application of social network analysis techniques to tradable permit markets, the valuation of environmental and natural resources, and marine resource economics.

"Texas Sea Grant is fortunate to bring on three accomplished scientists from diverse fields to enhance and strengthen our transdisciplinary extension team," says Dr. Pamela Plotkin, Texas Sea Grant Director. "The new positions were also created with the aim of building our presence within Texas coastal universities to capture the intellectual capacities there and build stronger foundations with the coastal communities they serve."



Bill Balboa

In March, the program also added a Matagorda County Extension Agent for Coastal and Marine Resources. **Bill Balboa**, formerly with the Texas Parks and Wildlife Department (TPWD), has decades of experience in bay system ecology and coastal fisheries.

"Texas Sea Grant is delighted to have Bill Balboa join our extension team," Plotkin says. "His background in Texas coastal fisheries and the Matagorda Bay and Galveston Bay ecosystems will be a tremendous asset for

Matagorda County and our entire program."

Balboa was TPWD's Ecosystem Leader for Galveston Bay from 2008 to 2014 and in the same position for Matagorda Bay from 1997 to 2007, coordinating fisheries and habitat data collection and conducting outreach to recreational and commercial fisheries, federal and state agencies, and other stakeholders. He also served as a Fisheries Biologist involved with the collection of data in Matagorda and Galveston bays and in the Lower Laguna Madre. He has a bachelor's degree in invertebrate zoology from Southwest Texas State University (now Texas State University) and is currently enrolled in the graduate environmental management degree program at the University of Houston-Clear Lake. The Matagorda County Agent position is a partnership of Texas Sea Grant, the Texas A&M AgriLife Extension Service and the Matagorda County Commissioners' Court.

— *Cindie Powell*

NURTURING NATURE MAKES Dollars and Sense



By Cindie Powell

With its outstanding natural beauty and ecological diversity, the Texas coast is a nature-lover's paradise.

As the coastal population continues to grow — it is estimated that the 6.1 million people who were living in the state's coastal zone during the 2010 census will be joined by almost 2 million more by 2030 — calls to preserve and protect coastal ecosystems are growing more urgent. While the conservation of Texas' coastal natural areas will create an important legacy for future generations, it also makes economic sense today.

Birding on the boardwalk at the South Padre Island Birding and Nature Center.

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Nature tourism contributes an estimated \$730 billion each year to the nation's economy, generates \$289 billion in retail sales and services and \$88 in tax revenues, and supports almost 6.5 million jobs. According to a 2011 U.S. Fish and Wildlife Service study, more than 90 million Americans spent more than \$144 billion on gear, trips, licenses, land acquisition or leases, and other purchases related just to wildlife-related recreation — hunting, fishing and wildlife-watching such as birding and nature photography.

In Texas, nature tourism spending in 2010 totaled \$57.5 billion, supported 529,000 jobs that earned \$16.5 billion, and generated \$7.6 billion in tax revenues. In-state wildlife-related recreation in 2011 had 6.3 million participants who spent \$6.2 billion in the state. A 2006 study found Texas saltwater anglers alone generated about \$981 million in retail sales that year for a total economic output of \$1.8 billion.

"We've got two trends going on right now in society that impact everything, but nature tourism specifically," says Miles Phillips, Assistant Professor in the Department of Recreation, Parks and Tourism Science (RPTS) at Texas A&M University and an Extension Specialist in Nature Tourism with the Texas A&M AgriLife Extension Service. "One is that, as a general rule, people realize that they really value and want a quality environment, some because they want clean air and water, and some because they value the wildlife experience and the outdoor experience, like hiking or hunting."



Saltwater recreational fishing is a popular pastime that generated almost \$1 billion in retail sales in Texas in 2006.

At the same time, the vast majority of the population now lives in cities instead of farms or other rural areas and doesn't have opportunities for day-to-day experiences with the natural environment. "In terms of nature, public and private lands have more value than ever in providing these services," Phillips says. "There's more economic opportunity because of the law of supply and demand. We have more people and more demand, and we have less open space and wild animals, we have less dark sky, we have less quiet areas, so if you have them or can create them from what you have, there's an opportunity."

The connection between conservation and the economic benefits of nature tourism is not new. The National Park Service owes its beginnings to a desire to protect natural and cultural treasures, and strong support came from the western railroads' building grand yet rustic hotels to promote the parks as tourist destinations and boost passenger ticket sales in the process. But while nature tourism in the 1800s and into the 1900s was broadly defined as travel to natural areas, more recently it has also included the concepts of sustainability and social responsibility, influenced by the advent in the 1980s of ecotourism, which is defined by the International Ecotourism Society as "responsible travel to natural areas that conserves the environment and improves the well-being of local people."

All tourism, if poorly managed, has the potential for detrimental effects. "There are definitely examples of places that have been improperly managed and therefore damaged because a lot of people were visiting them for the outdoor, wildlife-related experience that the place provided," Phillips says. From large sections of the Great Barrier Reef damaged by careless divers to the trash left on Mount Everest, improperly managed nature tourism can leave more than footprints.

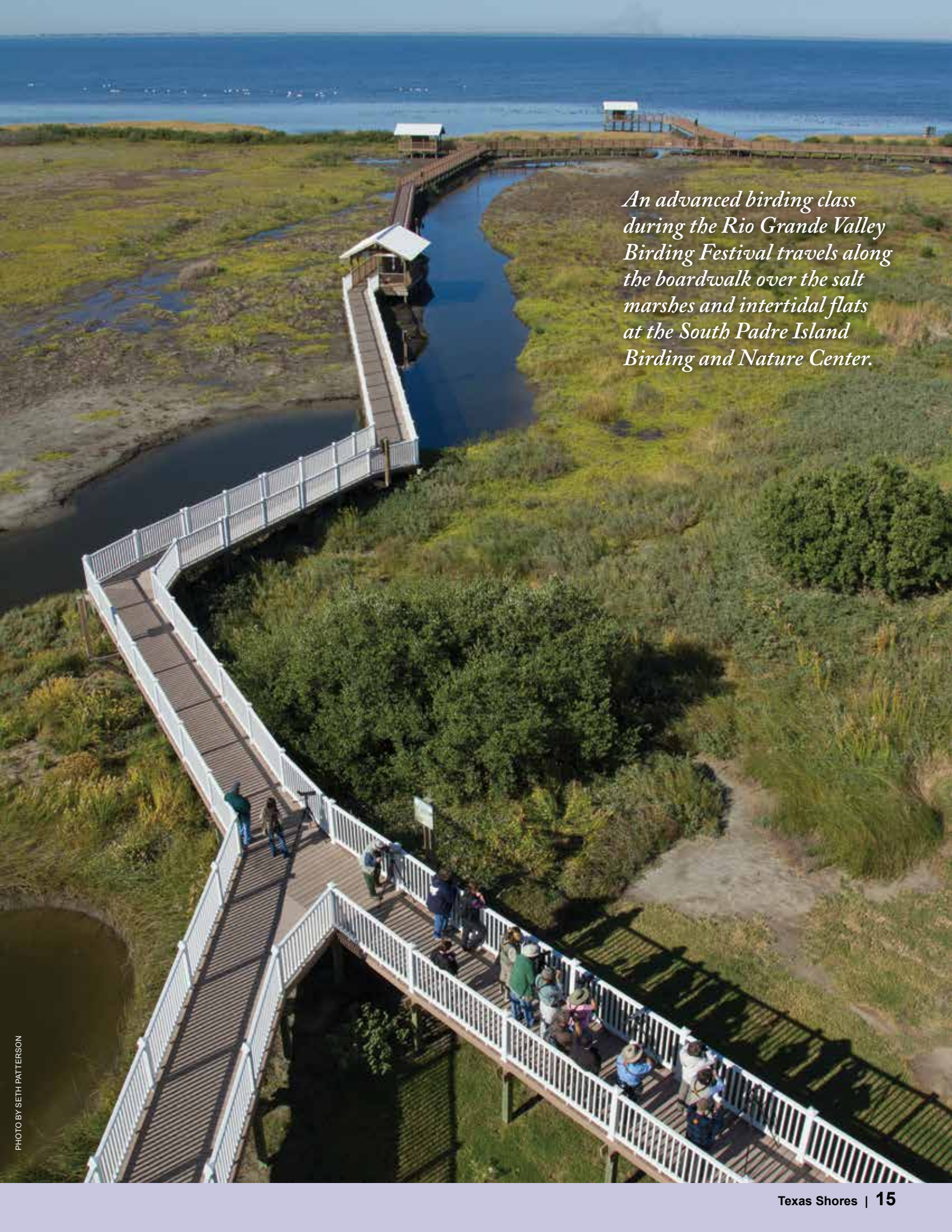
Ocean and coastal tourism is among the fastest-growing types, but these environments can be particularly sensitive. Visitors in too great numbers or too close proximity can disturb birds and marine animals, boat motors can tear up seagrass beds, and development to support tourism — construction of hotels, restaurants

and other amenities — can increase runoff pollution, freshwater diversion and dredging. In many cases, visitors may not be aware of the negative impact their behavior can have on the environment, and educating tourists, local residents and especially the tourism industry to the connection between their actions and the long-term health and sustainability of the coastal environment is one of the keys to addressing the problem.

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Phillips directs the Nature Tourism Development program at Texas A&M AgriLife Extension. Focusing on adventure tourism, agritourism, fishing and hunting, the program offers resources on its website (<http://naturetourism.tamu.edu>) and conducts training to help communities, businesses and nonprofit organizations that are both economically viable and ecologically sustainable. He calls the approach "market-based conservation." "We're working with communities to develop a market-based guide training and certification program without any regulations, where we provide training to help improve expertise and knowledge. The local tourism promotion organizations like convention and visitor bureaus and guide associations can then use and promote that additional professionalism so that customers know they're getting a better product."

In the spring of 2015, the program will officially open AgriLife Extension's first nature tourism and demonstration center. The Long Acres Ranch Nature Center in Richmond, located in a county with almost 700,000 people, is in the Houston area's rural/urban interface. The 750-acre former ranch on the Brazos River will offer outdoor skills training and experiences for



An advanced birding class during the Rio Grande Valley Birding Festival travels along the boardwalk over the salt marshes and intertidal flats at the South Padre Island Birding and Nature Center.

PHOTO BY SETH PATTERSON

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the public including paddling, hay rides, tent camping, night walks, photo hunts, campfire social events and naturalist-guided wildlife viewing, birding and nature walks. At the same time, the facility will offer training that focuses on the needs of nature guides, community representatives and outfitters.

Recent studies have suggested that unstructured outdoor play and exposure to nature can have important positive psychological benefits; the ranch will also serve as an outdoor laboratory to examine these issues. “We’re going to be able to offer the public recreational opportunities and offer researchers opportunities to do research to determine what makes the best-quality experience,” Phillips says.

Another area ripe for additional research is localized studies about the economic impact of nature tourism. Periodic national- and state-level surveys give the big picture, but studies at smaller, more local scales are done less frequently if at all, even though knowledge about the economic importance of natural areas can be crucial in local decision-making. One recent survey in the Rio Grande Valley focused on wildlife tourism with an emphasis on birding, and a study now under way in Calhoun County is gauging the importance of recreational fishing to the economy there.

Recent studies have suggested that unstructured outdoor play and exposure to nature can have important positive psychological benefits.

The Rio Grande Valley is one of the top birding destinations in the United States. “The Valley is the first resting place for colorful neotropical migrants from South America in the spring,” says Tony Reisinger, Texas Sea Grant’s Coastal and Marine Resources Agent for Cameron County. “We have over 500 documented bird species, and the Valley is the home of unique specialty birds year-round in



PHOTOS BY MILES PHILLIPS

Two brightly colored birds found in the Rio Grande Valley are the year-round resident green jay (left) and migrating painted bunting (right).

their most northern range. These specialty species draw birders from all over the world.”

According to a 2011 survey led by Dr. Kyle Woosnam, RPTS Associate Professor, people who traveled to the Valley for nature tourism activities like watching or photographing birds or other wildlife spent an estimated \$307 million in the Valley that year, leading to a total county-level economic output of \$463 million and supporting 6,613 full- and part-time jobs. Their purchases generated \$2.5 million in sales taxes and \$7.5 million in hotel taxes.

The researchers’ totals included only “intentionals” — visitors whose primary reason for traveling to the Valley was nature tourism. Woosnam says the researchers were careful to exclude people whose primary intent to travel was for other activities but who then went birding after finding out about the local opportunities for it. “We were very conservative in our approach,” he says. “Especially when you’re talking to people on South Padre Island, you have to make sure that they’re intentionally there to bird, not to visit the beach and then stumble into it as a casual birder.”

The study was commissioned by the South Texas Nature Marketing Cooperative, a nonprofit organization funded by chambers of commerce, visitors centers and birding hotspots in

the region. The last survey, conducted more than 15 years earlier, estimated that nature tourists contributed \$100 million to the local economy each year. Since then, opportunities for birding have been more aggressively marketed, especially in conjunction with the World Birding Center, a confederation of nine birding sites — state parks and city-owned properties — from Roma to South Padre Island with a wide range of habitats and species. Headquartered at Bentsen-Rio Grande State Park, the network’s final location, the South Padre Island Birding and Nature Center, opened in 2009.

The researchers surveyed visitors at seven birding sites, including four in the World Birding Center network, during the peak (October through December) and off-peak (May and June) tourist seasons. They also surveyed participants at the Rio Grande Valley Birding Festival in Harlingen. They found that during the peak period, the average “intentional” tourist reported spending \$822 per person per trip on nature tourism experiences, compared to \$494 per person for off-peak visitors. Many of the tourists were frequent visitors to the Valley — almost 75 percent of the peak and 64 percent of the off-peak tourists reported they had visited the Valley before, at an average of nine times and 14 times, respectively. And 85 percent of both groups said they were likely to return.

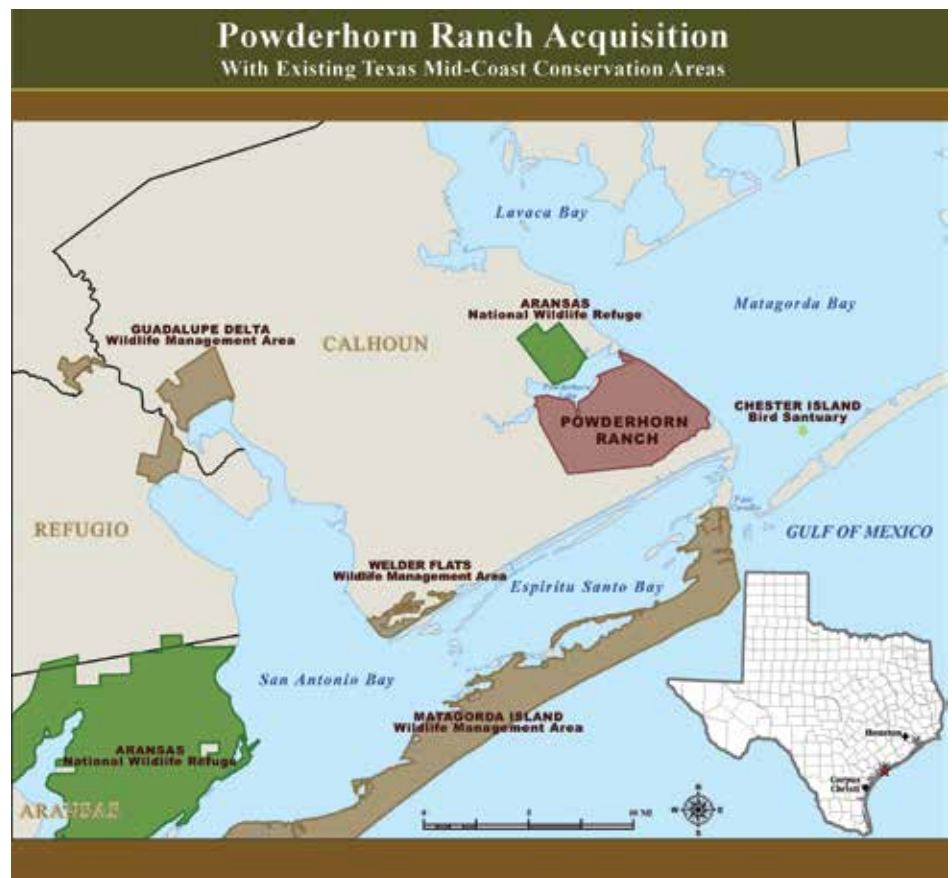
Local residents' responses were not included in the totals. "A true economic impact doesn't include local money, because we're looking at newly generated money coming from outside the county," Woosnam says. The survey results did show, however, that local residents also engaged in wildlife tourism spending, with expenditures averaging more than \$346 during the peak season and \$461 during off-peak.

Co-authoring the Valley survey were Agricultural Economics Assistant Professor and AgriLife Extension Economist Dr. Rebekka Dudensing, Extension Associate Dan Hanselka and graduate student Kayode Aleshinloye. Dudensing is currently working on surveys of saltwater anglers in Calhoun County to determine the economic impact of sportfishing there at the request of and with help from Rhonda Cummins, Texas Sea Grant's Calhoun County Coastal and Marine Resources Agent.

"Everyone knows that we have a lot of recreational fishing and fishing tournaments in Calhoun County, and everyone assumes that they bring in a lot of dollars, but no one has ever measured the economic impact. This is long overdue," Cummins says, adding that the surveys are intended in part to quantify the extent that the area, and in particular Port O'Connor, has changed from a historically commercial fishing economy into a recreational fishing one.

Dudensing says the surveys will help local residents better understand the changing economy of their community. "When we look at the decline in traditional fishing on the Texas coast and nationwide, there has to be something to pick up the slack in these rural areas," she says. "A lot of times that is tourism, so understanding how that industry is working is very important."

The surveys will focus on the expenditures of recreational anglers, including sales and hotel occupancy taxes, and include the number of jobs and labor income that result for people living in the area. Dudensing says it is important to quantify the economic benefits like tax revenues for local leaders so they can make more informed decisions, but it is equally important for average residents to be



The 17,351-acre Powderhorn Ranch property faces both Matagorda Bay and Powderhorn Lake and is in close proximity to the Aransas National Wildlife Refuge and state wildlife management areas.

aware of the positive impacts from tourism in their area to offset the perception of negatives like increased traffic.

Though it is not always the case, she says, economic surveys can also sometimes pinpoint new business opportunities. "I'm not saying it will happen in this case, but because we know what a general spending pattern looks like, sometimes we can see holes," she says. "If we find that nobody is spending in a certain sector, that could be an opportunity for a new business in the county."

More changes are in store for Calhoun County after a surprise announcement in late August of a major land acquisition for a future state park and wildlife management area a stone's throw from Port O'Connor. A coalition of conservation and natural resource organizations, including the Texas Parks and Wildlife (TPW) Foundation, the National Fish and Wildlife Foundation (NFWF), The Conservation Fund and The

Nature Conservancy, funded the purchase of the 17,351-acre Powderhorn Ranch for \$37.7 million, the largest amount raised for a conservation land purchase in the state.

For decades, the conservation community had been eyeing the Calhoun County property, one of the largest still mostly untouched tracts of coastal prairie, but lacked the resources to purchase the land. Coastal property values continued to rise, making the possibility of preserving the habitat more unlikely. Enter the 2013 plea agreements by BP and Transocean from the 2010 Deepwater Horizon explosion and oil spill, which resulted in the two companies' funding more than \$2.5 billion over a five-year period for NFWF's Gulf Environmental Benefit Fund to support projects intended to benefit species and habitats impacted by the spill.

From the fund, NFWF was able to commit more than \$34.5 million over three years for the Powderhorn Ranch

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purchase, making it the largest land acquisition in the nation to date using BP spill restoration dollars. Meanwhile, TPW, a nonprofit organization that raises funds to help the Texas Parks and Wildlife Department (TPWD) meet its management and conservation goals, was raising funds through private donations. The Nature Conservancy of Texas and The Conservation Fund also each provided \$10 million in interim funding and will be reimbursed by TPW, which will be the sole owner of the property by 2016; it will ultimately give the property to TPWD for development and management.

“In years to come, after the Texas Parks and Wildlife Foundation turns it over to the Texas Parks and Wildlife Department, we will go through a public master planning process,” says Tom Harvey, Deputy

The Powderhorn Ranch property is important in part because of its size. “The bigger the piece of ecology it is, the more functional it’s going to be,” says Dr. John Jacob, Texas Sea Grant’s Coastal Community Development Specialist.

Communications Director for TPWD.

“We will get stakeholder input, hold public meetings and develop a plan for managing, opening and public use of Powderhorn as a state park and wildlife management area.”

In the meantime, Powderhorn Ranch

is no longer at risk for commercial development. Leroy G. Denman, Sr., who in the 1930s coincidentally sold the federal government the surface rights to what became the Aransas National Wildlife Refuge, purchased the Powderhorn Ranch, then some 42,000 acres, in 1936. In the late 1990s and 2000, the family split up and sold the land, and the ranch went through a series of owners, including one who planned to subdivide and develop the property. The last owner was more conservation-minded and agreed to sell the property at less than market value to ensure its preservation.

The property is important in part because of its size. “The bigger the piece of ecology it is, the more functional it’s going to be,” says Dr. John Jacob, Texas Sea Grant’s Coastal Community Development



Coastal marsh shallows on Matagorda Bay at Powderhorn Ranch.

PHOTO JASON SINGHURST, © TEXAS PARKS AND WILDLIFE DEPARTMENT



Deer on Powderhorn Ranch.

Specialist. “That’s not to say that small, 100-acre pieces aren’t important, but it so much more important to save big pieces like this.”

The property includes forests of coastal live oak and thousands of acres of freshwater wetlands and salt marshes. “This is an area that’s never been plowed, never been land-leveled,” Jacob says, calling the land’s ecology “world-class unique.”

Powderhorn Ranch sits on the Ingleside Sand, an ancient former barrier island dating back 100,000 years or more. “This landscape has been there long enough that the mastodons stomped around on it,” he says. The coastal prairie on the ranch consists of a complex pattern of prairie potholes, or freshwater depressions, and pimple mounds, which are small knolls or humps of land one to two feet tall; their close proximity to each other creates an area of short-range habitat complexity.

“You just walk five feet and the environment changes,” Jacob says. “Some of these potholes might be wet for six months out of the year, then you’ll walk through areas that are intermediate, and then there’ll be pimple mounds that will be semi-arid or arid. You go from very wet to very dry in a very short range.”

Coastal prairie appears on the Texas coast from Beaumont to Brownsville, but it is estimated that as much as 99 percent of the historic acreage has been converted to agricultural or grazing land. Of the Ingleside Sand, which stretches in a narrow band from Calhoun County through Aransas, Refugio, San Patricio and Nueces counties to northern Kleberg County, much of it has been developed for residential, commercial and agricultural uses.

In addition to the coastal prairie and live oak forests, Powderhorn Ranch boasts more than 11 miles of tidal bay frontage, roughly half on Matagorda Bay and the other half facing

Powderhorn Lake, a tidally influenced secondary bay off Matagorda Bay. Four miles front Live Oak Bayou. Port O’Connor is to the southeast, and the property is also bordered by FM 1289 and State Highway 185.

The property is surrounded by several other public and private preserves, wildlife refuges and wildlife management areas, including the Aransas National Wildlife Refuge, which has one unit only three miles away across Powderhorn Lake and the main unit 25 miles to the southwest. The main unit is the primary wintering grounds for the world’s only wild migrating flock of endangered whooping cranes, which have been expanding their winter range in recent years and recently have been seen on Powderhorn Ranch. The property’s conservation can provide additional wintering grounds for the species.

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Cummins maintains a kayak trail around Powderhorn Lake. She says the purchase provides a great opportunity for future public access to the previously privately owned waterfront. “Public access is a huge issue, because there are too many places that the public can’t go. With the Texas Parks and Wildlife Department managing it, people will have more shoreline and more places to fish, kayak, sail and go birding.”

The role of Deepwater Horizon oil spill funds in the purchase has led some to speculate that future monies from the same source may someday also be available for similar purchases on other parts of the coast. Jacob says he believes there are tremendous conservation opportunities still ahead, particularly on the upper coast.

“This purchase helps people who are outside the conservation community see that we can get big pieces, and we can do it because the money can be leveraged,” he says. “In the Houston area, we have 10 times as much coastal prairie habitat of equal quality to Powderhorn Ranch — there are at least 180,000 acres of parcels that are 10,000 acres or larger, in a much more populated area.”

One current plan on the upper coast would coordinate the management and marketing of the existing publicly and privately owned natural protected areas as a single entity. The innovative proposal calls for the creation of a National Recreation Area that the National Park Service would promote nationally and internationally as a major tourism destination.

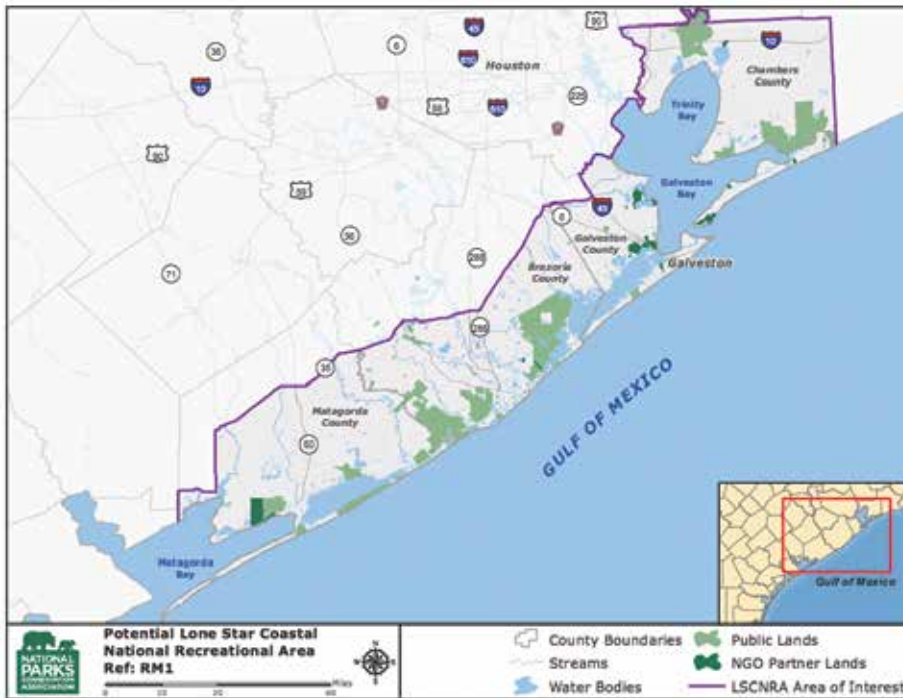
In the aftermath of Hurricane Ike in 2008, researchers from Rice University’s Severe Storm Prediction, Education and Evacuation from Disaster (SSPEED) Center were funded by a grant



Paddlers explore the Powderhorn Lake kayaking trail.

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IMAGE COURTESY NATIONAL PARKS CONSERVATION ASSOCIATION



The Lone Star Coastal National Recreation Area would encompass low-lying areas in four upper coast counties.

from the Houston Endowment to identify lessons learned from the hurricane. At the same time, a group on the Bolivar Peninsula was trying to understand what the future development of that hard-hit area would look like; in addition to standard beach development, local residents were interested in finding ways to generate income from the wetlands on the back side of the peninsula.

The SSPEED researchers took their interest and built it into a proposal for a Lone Star Coastal National Recreation Area (LSCNRA) encompassing the low-lying and undeveloped areas of Chambers, Galveston, Brazoria and Matagorda counties. National Recreation Areas are protected areas established by acts of Congress; several are already in existence around the country and most are under the purview of the National Park Service. The LSCNRA is patterned after two, the Boston Harbor Island NRA and the Santa Monica Mountains NRA, that are composed of multiple natural areas, parks, and historical and cultural sites with multiple owners. The SSPEED researchers anticipated that the unique qualities and

wildlife of the Texas coast would make it an attractive prospect for the National Park Service.

“We know that birdwatching on the Texas coast is world-class, but there has never been a national park focused on

“We’ve got the resources here, so we came up with the idea of linking these existing preserves in a system that is managed for outdoor recreation. I think it will be a great addition to the National Park System, and we have convinced a number of people that it is unique from an ecological standpoint,” says Jim Blackburn, a Professor in the Practice of Environmental Law at Rice University and Co-Director of SSPEED.

birdwatching,” says Houston environmental attorney Jim Blackburn, a Professor in the Practice of Environmental Law at Rice University and Co-Director of SSPEED. “We’ve got the resources here, so we came up with the idea of linking these existing preserves in a system that is managed for outdoor recreation. I think it will be a great addition to the National Park System, and we have convinced a number of people that it is unique from an ecological standpoint.”

Participation in the LSCNRA would be voluntary, ownership of the various properties would remain with the current owners, and no new regulations would be imposed on non-participating landowners. The arrangement would meet the need in Texas to safeguard existing property rights and minimize federal expenditures and federal acquisition of land; the National Park Service would use one or more of the existing sites to set up offices, rather than purchase additional property for that purpose.

Property owners already on board include the Houston Audubon Society, The Nature Conservancy of Texas, Scenic Galveston, the Galveston Bay Foundation, the Galveston Historical Foundation, the Boy Scouts Bay Area Council, Artist Boat, the Gulf Coast Bird Observatory, the Cradle of Texas Conservancy, the Matagorda County Birding Nature Center and Palacios Prairie Wetlands. Counties and cities with local parks have also pledged their participation.

Leading the coalition — and the charge to obtain Congressional approval of the LSCNRA — are former Secretary of State James Baker and prominent Houston businessman John Nau. With Doug McLeod of the Moody Foundation of Galveston, they are working with the National Parks Conservation Association (NPCA), a non-profit organization that supports the National Park System.

“We are hopeful that the Texas delegation will choose to introduce the bill in Congress sometime early in 2015,” says Victoria Herrin, Campaign Director for the Texas Gulf Coast at NPCA. “We have been working on a draft piece of legislation — it’s not quite finished, but it’s getting



Opportunities to observe wildlife like bottlenose dolphins are available all along the Texas coast counties.

close — and with the support and approval of our Texas delegation and also the statewide leadership in Austin, we hope to move forward shortly after the first of the year.”

To quantify the economic benefits of the project, NPCA conducted a study with the SSPEED Center. They concluded that, by 10 years after the formation of the LSCNRA, coastal tourism would increase by 1.5 million visitors, more than 5,000 new jobs would be created, an additional \$192 million would be generated in local sales, and personal income would increase by \$69 million.

Blackburn hopes that this kind of success will encourage other landowners to pursue the economic opportunities inherent in restoring the natural ecosystems on their properties. “We’ve been looking at trying to bring a different type of economy into our coastal counties that have traditionally been dependent on agriculture and petrochem,” Blackburn says, noting that the nature of agriculture has been changing, and water rights for agriculture are regularly being disputed in the Colorado and Brazos river basins. “Farmers are looking for different sources of income.”

As a companion project to the LSCNRA, SSPEED is building a Texas Coastal Exchange that would develop a market and allow private landowners adjacent to the National Recreation Area to sell ecological services that arise through the restoration of their properties to native prairie, wetlands or bottomlands. “They would be able to sell the ecological credits to various consumers, including carbon dioxide rights for carbon sequestration, as well as fish and wildlife benefits,” Blackburn says. “We’re developing a web-based trading system that we hope to have fairly well developed in the next six months. If this proves viable, it will transform ecological financing in the future.”

The LSCNRA and the exchange would work together as part of the non-structural portion of a flood control master plan. Federal flood protection requires a combination of components that are both non-structural and structural, such as coastal armoring projects like the Ike Dike or Centennial Gate. Blackburn says the LSCNRA has been envisioned from the beginning as part of an overarching plan for hurricane surge protection. “It’s not that it will reduce surge, but it produces economic

activity that can withstand surge flooding, and we think that is the definition of resilience,” he says.

“We looked at that marsh (on the Bolivar Peninsula) six months after Ike, and it looked pretty good. We’re just trying to learn a little bit from nature,” he adds. “If we can adapt our economy to basically be designed to withstand flooding, it’s a resilient economy.”

Couching the LSCNRA in terms of its economic benefits has resulted in strong support for the plan, as is often the case for conservation projects that can be linked to nature tourism, but TAMU’s Phillips points out other, less easily quantified positive effects. “The triple bottom line in business practices



Public releases of Kemp’s ridley sea turtle hatchlings are a rare treat for visitors at the Padre Island National Seashore southeast of Corpus Christi and at Sea Turtle, Inc., on South Padre Island in the Rio Grande Valley.

around the world is people, planet and profit, and nature tourism combines all of those — the economy, the quality of life through the environment, and the recreational-social side of getting people together,” he says. “We are all part of the natural world, and we need those exposures to nature for long-term health.” ♡

The Texas Gulf Coast: A Haven for Birds and Birders

By Cecilia M. Riley,
Executive Director, Gulf
Coast Bird Observatory



The Gulf of Mexico is a region of hemispheric importance to a great diversity of resident and migratory bird species. Hundreds of species of waterfowl, shorebirds, raptors, songbirds and colonial waterbirds utilize the shores of the Gulf of Mexico for breeding, over-wintering, and spring and fall migration staging areas. So it should come as no surprise that our Texas coastline is a dream destination for birders from the entire U.S. and even from around the world.

Whooping crane.

MICHAEL L. GRAY/GULF COAST BIRD OBSERVATORY

About 85 million Americans enjoy observing, photographing or feeding wild birds. Birding ranks 15th on a list of the most popular outdoor activities, just below bicycling and beach bumming, according to the most recent National Survey on Recreation and the Environment by the U.S. Department of Agriculture's Forest Service. About 18 million are serious enough to take trips exclusively to commune with other birders or count birds by sight or sound, according to the U.S. Fish and Wildlife Service's *2011 National Survey of Fishing, Hunting and Wildlife-Associated Recreation*. "Birding is one of those rewarding activities like exercising or reading or tending a garden ... that are just universally acknowledged as good things to do," says Jeff Gordon, president of the American Birding Association.

"And birding is so quick and portable, you can go birding on your lunch break from an office downtown or waiting outside the school to pick up your kid. Birds are everywhere."

The habitat diversity of our Gulf coastal region runs the gamut from the Pineywoods of East Texas to the Gulf prairies to the coastal wetlands to the South Texas subtropics, making for a great birding adventure — at any time of year. Spring migration can be one of the most remarkable and memorable events of a birder's life. As spring northerly fronts pass through, neotropical migrants

can accumulate by the thousands in the numerous migrant traps along the coast. Ocean beaches, bays, marshes and wetland flats can produce some of the nation's largest congregations of pelicans, waders, shorebirds, gulls and terns in any season. The National Audubon Society Christmas Bird Counts along the Texas coast are often the highest in the nation, reflecting the great diversity of wintering species.

The birding resources of the Texas coast are in a rapid state of growth and development as the economic impact of birding increases. Federal, state and local governments continue to set aside areas for nature study and birding. Private organizations, local Audubon chapters and local birding groups are more active than ever in establishing birding sanctuaries, trails and educational tools. The Great

Texas Coastal Birding Trail has created a new awareness of the importance of maintaining natural areas as bird habitats, and it has provided a wonderful resource to birders. Birding trail maps are available electronically at <http://www.tpwd.state.tx.us/huntwild/wildlife/wildlife-trails/coastal>.

Birding habitat can be found anywhere along the coast. The Texas coastal plain, extending from the Louisiana border to the Rio Grande River, is about 370 miles long. Along this plain, one can search for birds along the **barrier islands and beaches** for

About 85 million Americans enjoy observing, photographing or feeding wild birds. Birding ranks 15th on a list of the most popular outdoor activities.

numerous flocks of plovers, shorebirds, gulls and terns. In addition to the world-famous Bolivar Peninsula on the upper Texas coast, other barrier islands with good birding include Follett's Island, Mustang Island and Padre Island.

Behind the beach dunes lies a vast grassy plain. This *prairie grassland* produces nesting hawks and wintering species of owls and highly sought-after sparrows, to name a few. Good examples of coastal grasslands are Anahuac National Wildlife Refuge and Padre and Mustang Islands.

While the immediate coast is largely treeless, the exceptions to this rule are areas that are raised above the surrounding landscape either by large dunes or salt domes. These raised areas protect vegetation from saltwater inundation during high tides and tropical storms. The result is a *coastal woodlot*. Live oak, sugar hackberry and mulberry trees in these places offer an inviting green zone for neotropical migrants that have just crossed over the Gulf in spring or are returning to the Gulf in their fall migration. These woodlots — also referred to as mottes — attract a wide variety of passerine migrants, highlighted by vireos, warblers, tanagers, grosbeaks and buntings. The best-known sites are the Houston Audubon Society and Texas Ornithological Society sanctuaries at High Island and Sabine Pass, as well as Paradise Pond in Port Aransas, Packery Channel

and Blucher Park in Corpus Christi, and Quintana Neotropical Sanctuary near Freeport.

Marshes, both freshwater and saltmarsh, are highly productive birding areas. Marshes host a large assortment of nesting bird species, such as herons, egrets, bitterns, wrens, rails and the sometimes hard-to-find seaside and Nelson's sparrows. In winter, our most famous coastal bird, the whooping crane, resides here. Easily accessible marsh areas are on Galveston Island, at Goose Island State Park, Hans and Pat Suter Wildlife Park in Corpus Christi, and Anahuac and Aransas National Wildlife Refuges, where you can easily tour some of the largest marshes in our state.

If you feel the need for trees, birding the *river bottoms* that flow into the Gulf can be very rewarding. Live oaks and hackberries are normally the dominant trees, with black willow and the invasive Chinese tallow being common. Numerous elm, ash and even cypress trees are present in certain river systems. These habitats will vary in composition and birdlife from north to south. On the upper coast, riparian woodland can produce barred owl, red-bellied and pileated woodpeckers, Acadian flycatcher, and yellow-throated and prothonotary warblers. Along watercourses farther south, one might expect great kiskadee, green jay, or black-crested titmouse. Good examples of riparian woodland are Brazos Bend

State Park, San Bernard National Wildlife Refuge, Guadalupe River Delta Wildlife Management Area and the Nueces River west of Corpus Christi.

Texas coast birding is always productive, and any season can produce a rewarding experience. Most popular, however, is *spring* migration, when hordes of birds pass through on their way to their northerly nesting grounds. April and the first part of May are the most favored periods for birders to visit the Texas coast. One of the greatest thrills of birding is to be on the Gulf coast at this season when a norther blows in and it rains birds! The fields, bushes and trees may be alive with flycatchers, vireos, thrushes and warblers of nearly 30 species. A "fallout" can be a one-day phenomenon, or it can last for several days when a system stalls and produces inclement weather for an extended period. The best migrant hotspots include Sabine Woods, High Island, Quintana Neotropical Bird Sanctuary, Magic Ridge in Calhoun County, Paradise Pond in Port Aransas, Packery Channel on North Padre Island and Blucher Park and Rose Hill Cemetery in Corpus Christi, among others. In addition, any urban woodlot or urban neighborhood near the coast with trees and shrubs can become an instant spring migrant hotspot when weather forces the birds down.

Fall birding can be quite rewarding along the Texas coast, when weather

PHOTO © SETH PATTERSON



Black skimmer.

PHOTO © SETH PATTERSON



Buff-bellied hummingbird.

MICHAEL L. GRAY/GULF COAST BIRD OBSERVATORY



Magnolia warbler.

PHOTO © SETH PATTERSON



Roseate spoonbill.



MICHAEL L. GRAY/GULF COAST BIRD OBSERVATORY

Black-bellied whistling ducks.

systems are as important as in the springtime. Immediately after an early fall northerly system, birding will be at its best. Optimal migration windows are late September to early October, when landbirds are at their highest numbers. At this time, any early fall norther can produce species counts that are almost equal to April numbers.

Many birds *winter* along the Texas coast, as the mild weather produces plentiful food sources. Many of the familiar nesting species that occur in the heart of the continent are found in winter along the Texas coast, along with the many specialty species. For this reason, the Texas coast can provide an outstanding winter birding vacation. You may even wish to participate in one of the many National Audubon Society Christmas Bird Counts along the coast, a great way to meet local birders and to get information on local hotspots, rarities and more. A schedule for Texas CBCs can be found at www.texasbirds.org/cbc.html.

So are you ready to explore the birds of the Gulf Coast? To aid you in your quest, I highly recommend the following book: *A Birders Guide to the Texas Coast* by Mel Cooksey and Ron Weeks, available online at www.americanbirding.org/abasales. ♡

sea science

By Dr. Mona Behl

March of the Mangroves:

Studying the effects of mangrove expansion on coastal wildlife

Warming temperatures, rising seas and changes in rainfall patterns are driving a mangrove population explosion that is changing the nature of Texas' coastal wetlands.

Two Texas Sea Grant-funded researchers, Dr. Steven Pennings, Professor of Biology and Biochemistry at the University of Houston, and Dr. Anna Armitage, Associate Professor of Marine Biology at Texas A&M University at Galveston, are studying black mangroves' (*Avicennia germinans*) expansion into and displacement of salt marsh habitat to determine the possible effects on the wildlife, fisheries and communities of the Texas coast.

"Coastal wetlands in Texas support commercial and recreational fisheries, improve water quality, reduce storm damage and erosion, and provide habitat for endangered species and for species such as birds that support a vigorous tourism industry," Pennings says. "These resources are directly linked to local economies — commercial and recreational fishers, birders and tourists bring billions of dollars to the Gulf Coast economy each year."

Worldwide, coastal wetlands are dominated by either temperate salt marshes or tropical or subtropical mangroves. Salt marshes are more predominant along colder coastlines, while mangroves are limited to more tropical areas because they cannot tolerate the cold snaps that can occur in the temperate zone. Black mangroves are useful as a visible indicator of changing climate because they grow grouped together in stands, appear in the area between the high-water and low-water marks, and are at their northern limit for temperature on the Texas coast.

The area of the Texas coast covered by mangroves has varied over time. Sometimes, over a period of one to many years, the mangrove habitat expands. At other times, it contracts. Historically,

expansion of mangroves into salt marshes has occurred during periods of warm winters and contracted during periods of hard freezes. Although it has happened in the past, the challenges that long-term marsh-to-mangrove conversion would pose along the Texas Gulf coast are still not well understood, and experimental studies to explore the ecological interactions between salt marshes and mangroves have been limited.

On the state's central coast, the density of black mangroves has doubled in the past few decades as stands of the trees overtake smooth cordgrass and succulents. "Current mangrove expansions include areas of high public concern, such as the Aransas National Wildlife Refuge, which houses endangered whooping cranes," Pennings reports.

The expansion has been linked to a reduction in the frequency and intensity of extreme cold events, and research suggests that warming temperatures may lead to many coastal areas in Texas having scattered black mangrove shrubs of varying densities within salt marshes. Researchers

hypothesize that such mixtures of mangrove and salt marsh vegetation may support more numerous plant and animal species than a more homogenous vegetation type — waters around mangroves are known to create some of the most productive areas for fish and shellfish — and shorebird roosting and feeding habitat may be affected by landward encroachment of mangroves in response to sea level rise.

"The complex root structure of these dwarf trees breaks wave energy, thus making them natural barriers to hurricanes and tsunamis, and help in reducing erosion. In addition to having leaves that turn into sediments, mangrove stands don't get submerged quickly. These factors make mangroves quite resilient to sea level rise," Armitage says. Mangroves' other ecosystem services include high rates of carbon sequestration and storage — essentially taking carbon dioxide out of the atmosphere and packing it away in their soils.

Along with these advantages, however, expansion of mangroves may also have substantial ecological and coastal



An aerial view shows one of the researchers' experimental plots with 22 percent mangrove cover.

PHOTO BY DR. ANNA ARMITAGE

PHOTO BY DR. STEVEN PENNING



Dr. Hongyu Guo, a University of Houston postdoctoral researcher on the project, clears mangroves from one of the experimental plots with a weed whacker.

management implications. “Preventing mangrove expansion would be impractical, but good coastal management will seek to minimize and mitigate the negative consequences of mangrove expansion and take advantage of the positive consequences,” Pennings says.

To gain a better understanding about the impacts of mangrove encroachment, Pennings, Armitage and their research team set up a field experiment in 2012 on Harbor Island near Port Aransas under a two-year grant from Texas Sea Grant. They selected the site because it contains one of the largest, densest populations of black mangroves documented since the 1930s. To set up 10 experimental plots with a range of mangrove densities from 0 to 100 percent, the team used saws, clippers and weed whackers to thin the mangroves and allow salt marsh to re-establish itself. “This mangrove removal mimics dieback of mangrove stands following a freeze that kills or partially kills some or all of the aboveground mangrove tissue at a site,” Pennings says. Each mangrove plot was set up in three blocks and was equipped with a weather station fitted with sensors to measure wind speed and direction, and air and soil temperatures.

The researchers then checked how different variables, such as soil water content, wind speed, air temperature, soil temperature, and plant and animal diversity, responded to the different mangrove densities. They surveyed both at the small scale of a few yards in area to large-scale sampling over several acres. At the intermediate scale, the researchers also monitored the effects of mangrove density on microclimate characteristics such as wind and temperature, soil conditions, vegetation, and populations of benthic invertebrates, such as the clams, worms and crustaceans that live on the sea floor, and terrestrial invertebrates such as insects and spiders.

As might be expected, the diversity of plants is greatest at the mid-range levels of mangrove cover, where mangroves and salt marsh co-exist in similar densities, according to results from the small-scale sampling. The salinity of the soil declined rapidly at low levels of mangrove cover, and the water and organic content of the soil increased sharply at higher levels of mangrove cover. At the large scale, the sampling results showed little difference in three characteristics — pH; soil redox potential, which is an electrical measurement that shows the tendency of a soil solution to transfer electrons; and porewater salinity, which is the salinity of the water in the spaces between particles of sediment — between sites dominated by mangroves versus marsh vegetation. Mangrove sites did have sandier soils with lower carbon, nitrogen and phosphorous contents, which may be explained by their location closer to the Gulf. The researchers found no difference in the number of different species of vegetation, which is called species richness, but there were differences in the kinds of species found per unit of area depending on the mangrove density. While researchers are still recording results attributed to the change of seasons, some preliminary results indicate a strong relationship between mangrove density and wind speed and air temperature.

The researchers have established a dedicated website (<http://www.uh.edu/mangrove/>) to educate the public about the causes and consequences of the transition from salt marshes to mangroves on the Texas coast. The website also supports another aspect of the project, the involvement of citizen-scientist volunteers to assist with the tracking of birds within the experimental study areas. The website will provide information on study sites, and birdwatchers will be asked to report on species, numbers and behavior of the birds in the project area. Signs will also be posted at the experimental sites to recruit additional birdwatchers to conduct systematic observations of bird activity, concentrating on a single bird species at a time, and to educate citizens about mangrove expansion.

Some preliminary results indicate that birds are using the plots differently, depending on mangrove density. “Birds



Weather stations installed in each plot measure wind speed and direction, and the temperatures of the air and soil.

PHOTO BY DR. STEVEN PENNING

are important wildlife in Texas and very important for the ecotourism industry,” Pennings says. “Just from those two perspectives — protecting wildlife and economic benefits from the ecotourism industry — we want to educate Texans about the potential implications of mangrove expansion on birds. Some birds may favor the expansion, and other birds may be able to find other habitat. If the latter does not happen, they may adapt or even suffer. We would like to know such impacts in advance so that decisions can be informed.”

Analysis of the results from the first study is ongoing, and Pennings and Armitage recently embarked on a second two-year project, again with funding from Texas Sea Grant, to build on the original study by testing a series of hypotheses that emphasize variables such as soil water content, porewater salinity, wind speed, air temperature, soil temperature, the performance of marsh plants, plant diversity, insect and spider diversity, fish and other swimming organisms, and birds, all of which should quickly respond to experimental manipulations of mangrove density. By examining possibilities ranging from all-mangrove and no-marsh to all-marsh and no-mangrove, Pennings and his group expect to be able to address questions about the effects of mangrove expansion on migratory birds and other wildlife within the experimental plots.

In addition to the collected data, Pennings says another product of the project is the large-scale experimental field that is now available for future study. “The scale of this experiment is unprecedented in our field, and setting the plots up was an enormous amount of work that tested the endurance of a large field crew. Now that it is established, we believe that this experiment will be a valuable resource for at least two decades to come.”

The researchers’ long-term goals are to study how wetlands trap sediments and how well the vegetation will protect shorelines, and also to study the effects of mangrove expansion on fisheries. Pennings says that as the experiment matures, it will become valuable for measurements of such characteristics as the changes in sediments that are driven by vegetation and carbon; the organisms living in the soil; the soil’s ability to resist sliding; the accumulation of mineral and organic components in the soil; how carbon cycles through different forms between the ground, atmosphere, oceans and living organisms; and carbon stocks — how much carbon is stored as living or dead plant biomass.

“Our experimental plots are large in scale from the point of view of an experiment, yet these are small compared to movements of birds and fish. We will get some of the answers to our research questions from the experimental plots, and we will also compare our experimental plots to larger stands of mangroves and marsh. By combining those two approaches, we hope to get answers to broader research questions over the next 20 years,” he says. ♡



PHOTO BY DR. STEVEN PENNINGS

Mangroves, like these in Aransas Bay, are replacing salt marshes across the Gulf of Mexico. The consequences for ecosystem services are largely unknown.

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The University of Texas Marine Science Institute

by Melissa Gaskill



Dr. Donna Shaver

Sea turtle champion celebrates their return to Texas beaches

Each year for 10 years, Dr. Donna Shaver spent more than four months walking the beaches of North Padre Island, searching for something many thought she'd never find — a Kemp's ridley sea turtle returning to nest on the island where it had been released.

Kemp's ridley nesting had disappeared from the Texas coast in the 1970s. A remote beach in northern Mexico, once home to tens of thousands of nests a year, now saw only hundreds. Faced with the loss of the entire species, scientists launched an effort to re-establish nesting in Texas, where it had occurred for thousands if not millions of years. They collected eggs from Mexico every nesting season between 1978 and 1988, incubated them in Padre Island sand, and raised the hatchlings for a year, a process known as head-starting. Each turtle was marked with a living tag, a small piece of lower shell plugged into the upper shell, and released into the Gulf.

Ridleys take about 15 years to reach reproductive age, so Shaver began searching for returnees in 1986. She remembers the day it finally happened, in 1996, as if it were yesterday.

"I got a report of a nester and headed down the beach. She was still there, covered in sand. I brushed off her shell and when I saw the tag, I was ecstatic," Shaver recalls. "After all the years of waiting, it was so exciting. She symbolized real hope, the real possibility that we could recover this species. I had come here with that goal."

It's a goal that has motivated Shaver for more than 30 years. She first came to the Padre Island National Seashore in 1980 as a summer Student Conservation Association

worker while she was studying biology at Cornell University. Here, she saw a sea turtle for the first time and fell in love. After completing her degree, Shaver returned to Padre

Island as a seasonal employee, eventually earning a master's degree at Texas A&M University-Kingsville and a permanent job with the park service — as a radio dispatcher. To her, that was a way to get her foot in the door.

“My philosophy was, work hard, and if there’s an opportunity, someone will remember,” she says. It worked; she became a research biologist with the National Park Service, then, after completing a Ph.D. at Texas A&M University 10 years ago, chief of the Division of Sea Turtle Science and Recovery. Suffice it to say that Shaver has dedicated her career and her life to sea turtles.

Her dedication paid off. That returning head-started sea turtle proved that the animals could be experimentally imprinted to a location. The number of nests increased every year until, in 2012, 209 Kemp’s ridleys nested in Texas, 106 of them on North Padre Island.

Those numbers represent an incredible accomplishment, says Dr. Pamela Plotkin, Texas Sea Grant Director. Plotkin volunteered with the Kemp’s ridley program for three summers in the early 1980s. “I was sure Kemp’s were not going to be saved, that it was too late,” she recalls. “To see it happen was just mind-blowing. It is an incredible story that doesn’t get enough attention. Donna doesn’t get enough attention for her role in it.”

Shaver stays so busy she likely doesn’t notice. For more than a decade, she has managed patrols during the nesting season, from April to August. She oversees the lab at the National Seashore, where eggs from North Padre and the northern Texas coast are incubated, and manages the hatchling releases, which end in mid-August.

“You don’t know when nesting is going to occur, and I don’t want to be an hour away doing something else,” she says. “We’re patrolling from 6 o’clock in the morning until dark sometimes, over a very large area. I try to stay at work or at my home on North Padre so I can get here quickly. Hatching can happen day or night, and I spend the night at the lab and get up to check on nests.”

In the early years, Shaver spent those nights on the floor. From there, she eventually graduated to a cot and, finally, a real bed in her office. “She still takes part in every hands-on activity, and stays there so no hatchling waits too long before release,” Plotkin says. That’s important, because newly hatched ridleys have a limited energy supply to get them from the beach to the shelter of Sargassum mats floating miles from shore.

Every single nest is important, Shaver stresses. Only one in 400 eggs will become an individual that survives to reproduce, but that individual can produce many hundreds of eggs in its lifetime.

Nests are not easy to find. For one thing, the park contains 60 miles of beach, most of which requires four-wheel drive. For another, the small, light ridleys leave faint tracks on the beach that blow away quickly, leaving no sign that a sea turtle nested. The species also has a tendency to nest in arribadas, or groups, meaning the staff often must locate many nests quickly.

Eggs must be collected and handled with care or they may never hatch. Biologist Cynthia Rubio earned a spot on the staff



Shaver records details about a nesting sea turtle. The turtles are sometimes found laying eggs, but patrols also may have to rely on faint tracks left on the beach in order to find the nest.



Shaver and biologist Cynthia Rubio collect eggs from a sea turtle nest. The eggs are incubated in the laboratory to protect them from disturbances and increase the survival rate of the hatchlings.

only after proving her egg-handling ability. “Donna is very passionate,” Rubio says. “She gives more than 100 percent every day, year round, and always motivates us to keep the focus on protecting these animals.”

Shaver passes that passion on to those around her. “She convinced me that the Kemp’s ridley was the most special animal on the planet and we were the luckiest women in the world to get to work with them, and she was right,” says Plotkin.

Scientific research has been an important part of Shaver’s work. Her efforts tagging and tracking adult Kemp’s ridleys provided the

coastal icon

first information about where the females go after nesting. From 2010 through 2013, she collected data to help determine how the BP oil spill in the Gulf of Mexico affected nesting sea turtles and eggs, and she worked on proposals for post-spill restoration of sea turtles in Texas.

Dr. David Owens, Shaver's former Ph.D. advisor at Texas A&M and now the Associate Dean of the Graduate School and Professor of Biology at the College of Charleston, admires her ability as a scientist. "She has done her homework," he says. "It's great when a scientist who is also an advocate has done the homework and isn't guessing."

Rubio agrees that her boss is a thorough, careful scientist. "She does her research, gives the facts about what is going on, and uses good sound science to defend the work here."



Sea turtles that are immobilized by a sudden drop in temperatures are sheltered and then released when the weather warms. Shaver trains volunteers who want to help with sea turtle rescues during these "cold-stun" events.

Shaver grew up in Syracuse, New York, and credits her grandfather, Stewart Bobbett, for inspiring her interest in biology. "His basement was filled with aquariums of fish. Based on his influence, I decided that I wanted to work with wildlife, to help restore endangered species that had been depleted by human activity." Bobbett lived to see his granddaughter graduate college and begin working with sea turtles.



Attaching transmitters to adult Kemp's ridleys allowed researchers for the first time to track the females' movements after nesting. Pictured are, from left, Biological Science Technician Alane Humrich, Shaver and Biological Science Technician Bob Beatson.

Shaver's parents also encouraged her. "From the time I was very little, my mother always said, 'when you go to college,' at a time when women weren't necessarily expected to go to college," she says. Dolores Shaver died of cancer in 1995 while Donna was working on her Ph.D. Her father, Donald Shaver, passed away in 2010.

"He would cut out articles about my work and send them to relatives," Shaver says. "When he died, I found a large stash of those clippings. He was of the generation where they didn't say as much as a younger man might, so finding that was meaningful."

Engaged for several years, Shaver has yet to find the time to actually get married. Time off for anything is rare; what little of it she gets is spent with her fiancé and two Cairn Terriers, Ridley and Kayleigh. Ridley enjoys a reputation for sniffing out hard-to-find sea turtle nests, something Shaver taught him.

Considering public outreach a critical part of her job, Shaver works hard to get out the message about how people can help protect sea turtles. She uses a Facebook page called the Padre Island NS Division of Sea Turtle Science & Recovery, and posters, brochures, signs, presentations, and media interviews – lots of media interviews.

"She's actually very shy," Rubio says. "It's hard for her to get up in front of a group, but she'll do it because she knows the message is very important."

"She convinced me that the Kemp's ridley was the most special animal on the planet and we were the luckiest women in the world to get to work with them, and she was right."

—Dr. Pamela Plotkin.

Year-round, Shaver coordinates the Texas Sea Turtle Stranding and Salvage Network, part of a national network administered by the National Oceanic and Atmospheric Administration. In the winter, she offers public training sessions for those who want to help with cold-stun events, when cold-blooded sea turtles become immobilized by rapidly dropping temperatures. Unless the animals are found and taken to shelter, they may succumb to exposure or predators. A number of these events occurred in the winter of 2013-2014, affecting a total of nearly 1,200 sea turtles.

What many people don't realize, Plotkin says, is that Shaver also works

hard at funding her work and research. “She is constantly applying for grants, and she does good work, so she keeps getting funding.”

Shaver was honored in 2014 with a “Harte’s Hero” award from the Harte Research Institute for Gulf of Mexico Studies at Texas A&M University-Corpus Christi for her contribution to the recovery of the Kemp’s ridley. Her immense satisfaction at seeing the nesting ridleys return to Texas, however, has been tempered by smaller increases in numbers in recent years and a substantial drop in 2013. “We need to learn more about what is happening,” Shaver says, “and get back on track with the 12 to 19 percent annual increases we were seeing. This gives us real pause about the future of the species.”

Disappointing numbers aren’t Shaver’s first challenge, of course. When she started at the National Seashore, she faced controversy over the practice of head-starting, which was already in place. In the 1980s, it was incidental capture in shrimp trawls, a significant cause of sea turtle mortality. Her data helped the Texas Parks and Wildlife Department decide to close an area to shrimping from December through mid-May to protect mating, nesting and migrating sea turtles. The move ended up providing a nursery area for shrimp as well, a benefit the shrimpers themselves recognized. Today, she has a good working relationship with the

industry, which helps fund conservation efforts in Mexico.

“It’s about involving people and changing attitudes, or hoping to,” she says. “Kemp’s ridleys have been a distinct species for 4 million years, and in the blink of an eye in its evolutionary life span, humans almost decimated the species. We have an obligation to try to right that wrong so someday your grandchildren can come out and see a nesting turtle or a hatchling release. We learn more all the time about the role of these animals in a healthy ecosystem, too, and there could be ways they are integral to the ecosystem that we still don’t understand.”

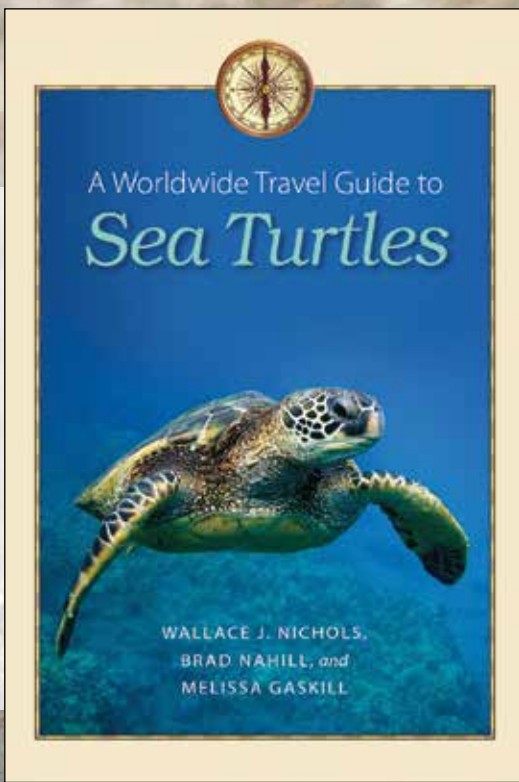
One thing that keeps her going is the reaction people have to sea turtles — children at hatchling releases whose eyes get big when they see the little turtles, and people who have come long distances to see a release or who spend hours waiting with a stranded turtle until it is rescued. “It is so moving to see how people are so excited about the work we’re doing and think it is so important,” she says.

“I feel very fortunate to have accomplished so much and very grateful for the opportunities that I’ve had. I decided to devote my career to help save Kemp’s and other sea turtle species, and I think I have made a difference.” ♡



Shaver and Colin Campbell, then-Superintendent of Padre Island National Seashore, release Kemp’s ridley hatchlings. Some releases are open to the public, and people travel long distances to see this rare event.

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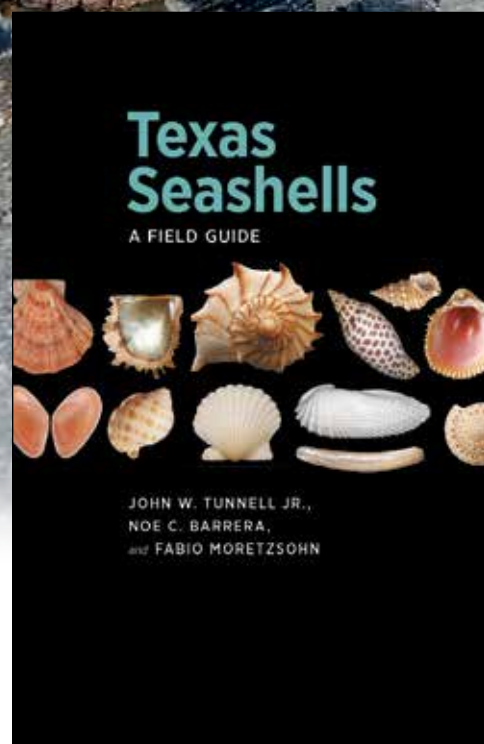
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For marine mammal stranding emergencies, call 1-800-9-MAMMAL.

First Aid Tips:

- If it is beached, DO NOT return the animal to the sea.
- One or two people should stay with it until expert help arrives, but keep crowds and pets away.
- Keep the animal cool and wet. Shade it with a tarp or towels, or apply wet towels or t-shirts to the body except for the fins, flippers or tail. Apply ice packs to the dorsal fin, pectoral flippers or flukes to prevent overheating, but don't let the ice touch the skin directly.
- Keep water and obstructions away from the blowhole.
- Relieve pressure on fins by digging holes under them. You can dig a pit under the mammal and fill it with water to relieve pressure on its lungs.
- If it is in the surf, support its body in an upright position and keep water out of its blowhole. Move it into shallow water if possible, but keep it in the water.
- Be careful around the powerful tail and mouth.

For more first aid tips, visit the TMMSN website at <http://www.tmmsn.org/>.

NOAA also has a free smartphone app, "Dolphin & Whale 911," to help with reporting and aiding stranded marine mammals in the southeastern U.S.

Sea Turtles

The Sea Turtle Stranding and Salvage Network (STSSN) is a national network of volunteers that document sea turtles that are found stranded in the U.S.

If you find a stranded sea turtle, please report it by flagging down a passing turtle patroller (April through mid-July) or law enforcement officer, or by calling the appropriate area coordinator. If you do not know the number for the area coordinator, call 1-866-TURTLE5 and a recorded message will give you that number.

- Report the turtle's location, size, proximity to the surf, and condition (alive or dead).
- Mark the location.
- If the turtle is alive, stay at the site if possible until an official arrives.

A list of the seven area coordinators is available at <http://www.nps.gov/pais/naturescience/contact-info.htm>.

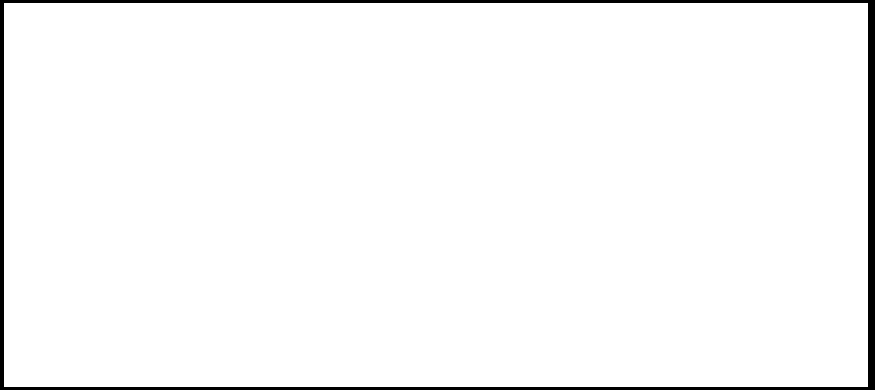
Birds and Other Wildlife

The Texas Parks and Wildlife Department maintains a list, including phone numbers and other contact information, of wildlife rehabilitators by county on their website at <http://www.tpwd.state.tx.us/huntwild/wild/rehab/list/>.

For marine mammals and sea turtles, call for assistance even if the animal is dead — research can provide valuable information about these animals and their environment.

Sea Grant Texas

AT TEXAS A&M UNIVERSITY
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Sunset on Powderhorn Lake.

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