



Blue Flag Iris by Verva Densmore

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President's Corner by George Kyame, President 2017

Greetings fellow naturalists! I hope you are all enjoying this rather mild spring weather we are having. I know I am, but cannot help but think this may be the calm before the 100 degree storm!

Speaking of the season, I would like to mention a couple of recently completed successful undertakings. By all accounts, Beach and Bay was a smashing success, having bested its all-time overall numbers at Galveston Island State Park, on what was a gorgeous day of many enriching and educational activities. Also, Featherfest, although early in migration dates, had a wonderful attendance with over 215 species reported. Both of these events had many things in common, but of huge significance to me was that they were both heavily staffed by Galveston Bay Area Texas Master Naturalists! Congratulations and thanks to all that participated.

Hawk Watch, the recording of northward migrating raptors, wrapped up May 1st as well. Large numbers of Broad-wing Hawks were not seen, which left a few of us considering at our post party how successful we were. It was concluded that the much lower numbers are still important to note, as the information will still be of use when compared to previous and future migrations, and the variables affecting raptor behavior. The citizen science continues to work.

Big Congrats to the MN Class of 2017. On April 27th, the final class was held at Carbide, and concluded with a room full of zealous pitchers of naturalist opportunities. This was a great class and I made many new friends. This was also a job well done by all of the training class organizers. Thanks from the chapter and the 2017 class! Of note, this new class already has over 900 volunteer hours. Awesome!

And lastly, on May 8th, a large, bechandeliered ballroom was packed to honor the recipients of the Terry Hershey Bayou Preservation Stewardship Award. Our own Founding Father, Dick Benoit, was one of three recipients. Dick represented the private sector portion of the ceremony. Yes, indeed, we are all very proud of you, Dick Benoit, in all you have done to organize this grass root effort in Preservation, Conservation, Restoration, and Education. Thank you!

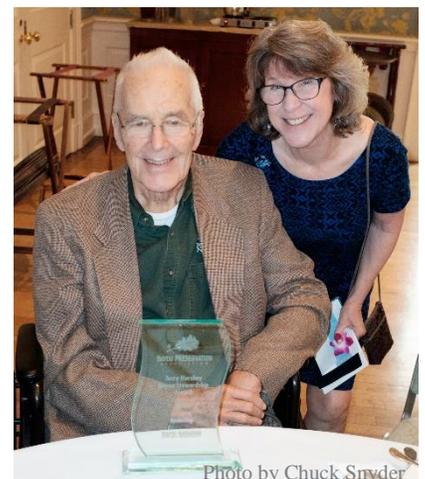


Photo by Chuck Snyder

Next Chapter Meeting

June 1st

The History of Texas Game Wardens

By

Jennifer Provaznik
Texas Game Warden

At Carbide Park

Prairie Ponderings: Dick Benoit Received BPA Award by Diane Humes

The Bayou Preservation Association, on May 8, 2017, honored Dick Benoit, the founding father of our Galveston Bay Area Chapter of Texas Master Naturalists, with the Terry Hershey Bayou Stewardship Award, an award presented to those "who have demonstrated an outstanding commitment to aiding in the conservation, preservation, restoration and/or advocacy of our region's waterways."

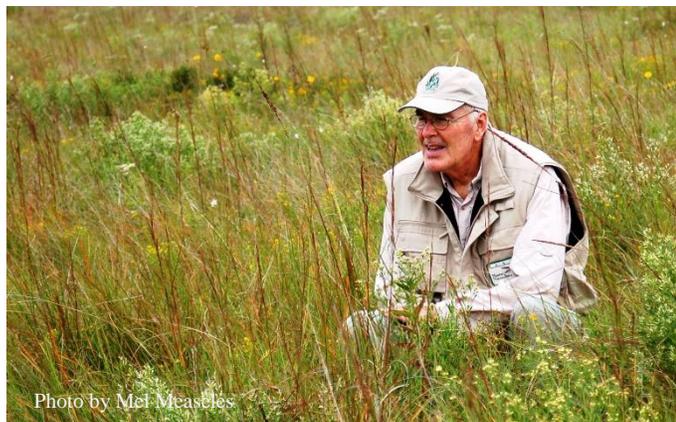


Photo by Misl Measles

Dick has been a Texas Master Naturalist for 18 years; he is the first person in the organization to earn 15,000 volunteer hours. When he joined the first training class for the Gulf Coast Chapter in 1999, this was the only chapter in the Houston-Galveston area. Dick recognized from the beginning that Bear Creek Park on the northwest side of Houston was too far to go and envisioned the possibility - indeed, need - for a chapter closer to home.

He helped with the second Gulf Coast training class, held conveniently at Armand Bayou Nature Center (did Dick suggest that?), learned all he could about the organization, formulated his own ideas, talked Carolyn Lovell and Margaret Pickell into helping set up a new chapter, then convinced Julie Massey to become advisor

to the Galveston Bay Area Chapter. It is difficult to say "no" to Dick. Several of Dick's organizational ideas included setting up committees to create advanced training and volunteer opportunities, following the logic that if you require people to do both each year, you need to help make it possible for them to do so. He always strongly stressed the 3 F's: Food, Fun, and Friendship, as the glues that bind us together - and so they do!

When both the Galveston Bay Area Chapter and the Wetland Restoration Team were in their infancy, one man linked them together and set them on their partnership journey. The man was, and is, our own Dick Benoit.

Already a prairie and Hawk Watch fanatic and water quality monitor at Armand Bayou, Dick spotted a newspaper advertisement that launched our lasting partnership with wetland restoration. Marissa Sipocz (now Marissa Llosa), of the Texas Coastal Watershed Program, needed help collecting and propagating plants for a wetlands project on Brays Bayou and Dick and Carolyn answered the call. They recruited their friends, acquaintances, and anyone else they could find and the Wetland Restoration Team was born and a true partnership forged.

Dick had a career as a brilliant and dedicated teacher; he continues to teach all of us, as well. A man of many interests, Dick helped form the Coastal Prairie Partnership. With foresight and planning, launched our Galveston Bay Area Chapter, the Wetland Restoration Team, Prairie Friday, and Hawk Watch, leading each to self-sufficiency. He has never ceased thinking of ways to improve the organization, tweaking, fine-tuning, adapting, as needed, so that we all can better accomplish our mission as Master Naturalists.

Congratulations on a much-deserved award and thank you very much for a job well done!

Wetland Wanderings: Texas' Only Terrapin by Lana Berkowitz

If your wetland adventures take you to brackish areas with saltwater marshes and shell beaches, keep watch for the Texas Diamond-backed terrapin.

Little is known about Texas' only species of terrapin or its limited distribution in the larger Galveston Bay system. Many who study them will be interested if you spot one, according to Jenny Oakley, Environmental Institute of Houston (EIH) environmental scientist. As more research

is compiled, the health and numbers of the terrapin will be another indicator of the overall health of Texas bays. EIH has been studying the elusive Texas Diamond-backed terrapin for 10 years and continues to uncover new information about the estuarine species.

The only species of brackish water turtle in North America, the Diamondback terrapin ranges from New England to Texas. The Texas subspecies (*Malaclemys terrapin littoralis*) found in Galveston Bay, particularly

around the North and South Deer islands, is the focus of the EIH study. EIH calls them Diamond-backed terrapins, while Texas Parks & Wildlife and others use the name Diamondback terrapins.



Photo courtesy of Environmental Institute of Houston

However you spell their name, the terrapins have shells that range from 4 to 9 inches, with the females noticeably larger. It is named for the diamond-shaped scutes or plates that form the carapace.

The carapace is dark and the lower shell, plastron, is pale. It is known for its polka-dot skin and often has a dark mark over its lip that resembles a moustache. The feet are webbed, with bigger and darker back feet.

The terrapins can live up to 40 years. Males reach maturity around age 3, and females mature at age 6, according to the TPWD website.

They prefer to go to the same nesting area each year to lay four to 18 eggs in the spring. Nest temperatures

determine the sex of newborns. Warm temperatures produce females.

Habitat destruction is a major threat to the Coastal Bend terrapins' survival, but they also are drowned in crab traps and killed on roadways.

A recent graduate of University of Houston-Clear Lake/EIH studied the diet of Texas Diamond-backed terrapin and found that male and female terrapins within the same population have significantly different diets.

The larger females with thick jaw plates eat mostly gastropods, especially marsh periwinkles. The males consume more decapods, such as blue crabs.

Although funding has been reduced, EIH research continues. If you see a Texas Diamond-backed terrapin, take a photo, record your location (latitude and longitude are best) and send the information to EIH@uhcl.edu.

For donations, EIH has an Adopt-a-Terrapin program (prtl.uhcl.edu/environmental-institute/outreach/adopt-terrapin). For \$25, you get an adoption certificate for a Texas Diamond-backed terrapin that you name.

I named my terrapin adoptee Iron Fist. The name was chosen after I looked up from my laptop and said to my spouse: "I'm going to adopt a terrapin." With no questions asked, he answered, "OK."

"What do you want to name it?" I asked. You can guess what we (mostly he) were watching on Netflix at the time.

So here's wishing good luck to Iron Fist. I hope you become a terrapin superhero and conquer all your challenges on Galveston Bay.

Beach Patrol: Congratulations to Alan Wilde! by Lynn Wright

Alan Wilde, class of 2002, was named an Everyday Hero by the Galveston County Daily News.

Everyday Heroes are nominated by newspaper readers to recognize people in the community who go out of their way to make a difference in the lives of their neighbors, or in Alan's case, the lives of American oystercatchers. Alan was among 12 honorees recognized during an April awards ceremony at the Galvez Hotel.

Alan volunteers for a variety of organizations, including NOAA, Gulf Coast Bird Observatory (GCBO), Texas Audubon and Galveston Island State Park. His passion is protecting the American Oystercatcher.



Photo by Tim Long

American oystercatchers are handsome shorebirds that live along the western Gulf Coast. They nest on bay islands and are considered a species of high concern; their population numbers are in danger because of overwash, predation, and human disturbance.

Alan monitors and photographs the oystercatchers living around Galveston. He kayaks West Bay to monitor oystercatcher populations, at least weekly. He helps Dr. Susan Heath, GCBO avian conservation biologist, band adults and chicks during the February-August nesting season. Alan is a cofounder of NICK-AMOY (Nesting Island Cleanup by Kayak-American Oystercatcher), a group that removes debris from nesting islands during the off-season. He also works with others, including

Texas Parks & Wildlife, Scenic Galveston and the Galveston Bay Foundation, to rebuild or create new nesting habitat for oystercatchers.

Alan is one of the prime rescuers for oystercatchers and other birds that are injured. He has coordinated several rescue missions for oystercatchers entangled in fishing line that have been spotted at the Texas City Dike and in Freeport.

In addition to his work with oystercatchers, Alan is writing a history of the Flower Garden Banks National Marine Sanctuary for NOAA, leads kayak tours for Galveston Island State Park, and walks the beach for sea turtle patrol during the Kemps Ridley April-July nesting season.

Assisting the Attwater's by Sandy Parker

The year was 1982. The predawn morning was thick with sea fog. There we were lying on our bellies at the "old" Dickinson Airport waiting and listening. The fog was so thick we couldn't see a thing. We heard small aircraft begin to take off. Then we heard it - the faint "woo woo" call.



Photo by Deborah Repasz

Just as the sun was beginning to rise and the morning sky was turning a pinkish orange, there they were, dancing on the edge of the runway. The Attwater's Prairie Chickens (*Tympanuchus cupido attwateri*) in all their breeding glory. The males, drumming their feet; their tail feathers and pinnae feathers raised up, filling their bright orange air sacs with air, emitting the characteristic booming sound. All of them dancing in a lek - that aggregation of males performing their best moves, all to entice females. It was magical!

There were seven remaining birds at the airport. And we saw them all that day. The image of the sunrise and the males displaying will forever be burned into my memory.

Fast forward 21 years and I'm working at NASA's Johnson Space Center (JSC) as an environmental specialist. The director of JSC received a letter from the president of the Houston Zoo. In it, he asked if the zoo could possibly use some of JSC's prairie for captive breeding of the Attwater's Prairie Chicken. The zoo is involved in the U.S. Fish and Wildlife Service (USFWS) captive breeding program for the Attwater's Prairie Chicken, a critically endangered species. A species that is only found in Texas. Let me repeat that, the Attwater's Prairie Chicken is only found in Texas. Nowhere else in the world.

So why did the zoo make such a seemingly odd request? The Houston Zoo was asked to join in the captive breeding program by USFWS in 1994, when the population of Attwater's took a complete nosedive. The zoo hastily built "Boomtown" to house the captive flock.

Unfortunately, Boomtown was near the noisy Children's Zoo and with Life Flight helicopters flying overhead, the area was not very peaceful or conducive for breeding. The birds were not doing well there. JSC had a nice, quiet bit of prairie, where armed guards patrolled the grounds. The birds would be safe and secure.

Following receipt of the request, the JSC director asked my director of Center Operations to consider it. Knowing my interest in birds and all things environmental, my director asked if I would be interested in coordinating this project. Was I dreaming? Of course, I was interested. I was ecstatic!

So, I began the process of getting agreements in place, drawings approved, permits in place and all the other tasks required to have a critically endangered species housed and bred on a federal facility. By 2005, the zoo had built the pens and transferred its entire flock of Attwater's Prairie Chickens to the JSC.

So, now you have the backstory. Let's talk more about these magnificent birds. Currently there are about 130 birds left in the wild at two locations in Texas. One is the Attwater's National Wildlife Refuge near Eagle Lake and the other is on private land in Goliad County.

At the turn of the 20th century, there were about one million Attwater's occupying the six million acres of coastal prairie habitat that stretched from Corpus Christi into the Bayou Teche area in Louisiana and ran 75 miles inland.

As the coastal prairie habitat disappeared due to farming and population expansion, so did the Attwater's Prairie Chicken. By 1919, the Attwater's Prairie Chicken was no longer found in Louisiana. By 1937, the population was down to 8,700 birds. A bird that was once fed to the cowboys on cattle drives so often that they began to rebel and would only eat prairie chicken once or twice a week, was now prohibited from being hunted.

In 1967, the bird was listed as endangered with only 1,070 birds in the wild. The Endangered Species Act of 1973 provided protection for this unique, special bird. The Attwater's Prairie is the most endangered bird in North America. Did I mention it is only found in Texas?

Currently, less than one percent of the coastal prairie habitat remains; another endangered "species." Per the USFWS, fewer than 200,000 acres of coastal habitat remain, fragmented in two Texas counties. In 1994, when the Houston Zoo was asked to join the captive breeding program, there were fewer than 160 birds in the wild. Other facilities that assist in the captive-breeding programs are Fossil Rim Wildlife Center, Abilene Zoo, and Tyler's Caldwell Zoo

The Attwater's Prairie Chicken is a subspecies of the Greater Prairie Chicken and is related to the now extinct Heath Hen. The bird was named for Henry Philemon Attwater, the director of the National Audubon Society from 1900 to 1910.

These birds are a lekking species. In the wild, the males congregate on a bare patch of ground or short-grass prairie called the "booming ground." It is here, from February to May, that the males perform their displaying behavior to attract a female. They hold their tails erect, raise the pinnae or ear feathers, inflate their air sacs called gular pouches, then they drop their heads deflating the air sacs emitting wooing sounds. They stomp their feet quickly.

After the female observes this behavior and picks her mate, she then goes off to make a simple ground nest where she will lay about a dozen eggs. With luck, the chicks hatch 26 days later. The female raises the chicks until they are around six weeks old. They eat a diet of high protein insects and then, when they get older, they also feed on leaves, flowers and seed of the prairie plants.

The birds weigh about 1.5 to 2.5 pounds and live one to two years in the wild. However, as I've heard said many times by zookeepers, "everybody likes to lunch on a Prairie Chicken." The Red Imported Fire ants (*Solenopsis Invicta*) will quickly devour a chick, snakes and raccoons love to dine on the eggs, and raptors pick up both chicks and adults alike for a tasty meal. After Hurricane Ike, I came back to my office to find a plate of chicken bones, with a note from the Hurricane Ride-out Team: "We got hungry so we ate your prairie chickens."

Once the birds are raised in captivity, some are released at the refuge while others remain in the captive breeding program. It all depends on the genetics of each bird. The birds are paired based on their best genetic compatibility; sort of like computer dating for prairie chickens. In captivity, the birds can live up to 7 years. The captive population is about 200 birds. Designated birds are released at the refuge and some have been released on the private land in Goliad. Currently birds are not being released at the Texas City Prairie Preserve, but there is hope for the future.



Photo by Sandy Parker

Those of you who have volunteered at the Texas City Prairie Preserve, where Attwater's once roamed, know that there has been a lot of effort put into saving this

spectacular bird. The Galveston Bay Area Chapter (GBAC) is also helping at NASA. This past year many dedicated GBAC-TMNs visited the JSC site every Monday to battle the invasive Deep-rooted Sedge (*Cyperus enterianus*) or DRS. This is a problem that has gotten out of control in the pens. Since September 2016 our outstanding volunteers have accomplished the following:

1. Removed all the seed heads from the DRS plants growing in all 24 pens
2. Dug DRS from 10 out of 24 pens
3. Planted turnip/rape seeds in six pens to hold the soil and provide food and cover for the birds
4. Collected 11 Eastern Gamagrass (*Tripsacum dactyloides*) plants from off-site and planted them in five pens.
5. Pen 1: Sprayed a 20 percent vinegar solution and covered the area with black plastic to test for mortality of DRS.
6. Pen 2: Sprayed 20 percent vinegar solution (no plastic)
7. Pen 7: Covered with black plastic. Plan to leave the plastic through the summer and into next year
8. Pen 8: Applied 20 percent vinegar solution (no plastic)

Since September 2016, our group has logged 253 hours. Of those, 182 were logged in 2016, and 71 hours in 2017. I am so grateful for the help of our dedicated volunteers. We have accomplished more than I ever dreamed we would in such a brief time. I hope everyone decides to come back next fall when we begin again.

We hope to see some new faces too. If you would like to join us, please contact me and our NASA contact (and GBAC member) Sumera Ali. You must obtain a visitor's badge to enter the NASA property. That takes a few days, so please let us know in advance. You also can help by Adopting a Prairie Chicken through Texas Parks & Wildlife at:

tpwd.texas.gov/huntwild/wild/birding/apc/involvement/

Or by joining the Friends of the Attwater's Prairie Chicken Refuge at: www.attwater.org/get_involved/

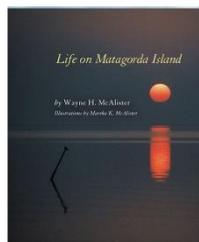
The birds started displaying their breeding behavior at the end of February and our last workday was March 6.

I'll close with an exciting note: As of May 4, 219 eggs have already been collected!

Heritage Book Study – Review of *Life on Matagorda Island* by Madeleine K. Barnes

Pause to think for a moment about the activity, both in the day and in the night, happening along the beachfront and then the different activity that happens on the bay side here along our Texas coastline. What mysteries unfold beyond our vision and our understanding?

Wayne H. McAllister, and his wife, Martha, moved to Matagorda Island to live in this remote wildlife refuge. For seven years they lived as the only human inhabitants on the 38-mile barrier island while he worked as an environmental education specialist with U.S. Fish and Wildlife Service. McAllister retired as professor of biology at Victoria College and he and his wife have co-authored two other books on Texas natural history.



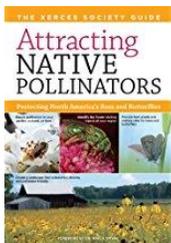
In *Life on Matagorda Island*, McAllister references his journals to describe what their life was like and the various fauna and flora that called the island home. He details the history of the island, its formation, colonization by Native Americans and European settlers, up to the present-day

establishment as a National Wildlife Refuge and State Natural Area, with a large part of it acquired by The Nature Conservancy.

It is as though you are reading poetry at times, due to the grace of his descriptions of even the smallest of creatures that he uncovers in the sand or marsh. His writing is enriched by Martha McAllister, who provides the illustrated drawings, keeping them simple enough for anyone to recognize.

Do you know why oysters spit, why pistol shrimp snap, or how debris from offshore boats affects the beach environment? McAllister describes his observations of living organisms and plants with such depth and understanding that you feel his enthusiasm and passion for this amazing habitat. He helps you see and relate to the fragility of the ecosystem and the impact of our growing human population on the Texas coast.

He has been called a master educator and this book demonstrates his level of detail while using plain language. You can picture yourself walking along the beach at night with him seeing ghostly twinkles of lights on the beach, as luminescent comb jellies, sea walnuts, and glow-worms light up every crest of wave. This book is a delight to read and makes a great coastal reference. One of the best quotes from the book is, "We try to stay in the background, enthralled observers," McAllister writes. "We do not belong, can never truly belong, but we can coexist and commingle. Close enough."



Our next reading selection for the next three months is *Attracting Native Pollinators* by the Xerces Society. The discussion for June 10th is the first 113 pages of the book. Due to the July 4th holiday, the Heritage Book Study will meet on Monday, July 10th to discuss pages 114-226. On August 7th, there will be a special book study discussion of pages 227-339 with a panel of master naturalists and master gardeners to discuss and respond to questions about pollinators,

plants, and issues in our local area. Our local master gardeners who have read the book are also invited to attend this event.

We welcome your participation each month for two hours on the first Monday of the month (except July as mentioned above) starting at 10:00 a.m. at the Agrilife Extension office. We look forward to seeing you and please let us know if you have read any good naturalist books lately! Happy trails!

My Introduction to Bioluminescence by Jay Cross

I recently visited the bioluminescent bay on the Isla de Vieques, a part of Puerto Rico. Any magician would sell his first-born to transfer the effect to Vegas. When I dipped my paddle in the water a yellow-green glow instantly surrounded it. When I paddled, the glow followed the paddle. When I swept the broad edge of the paddle across the top of the water, I created a sheet of light. When I scooped up a handful of water, individual points of light winked at me. This was eerie. Humans use winking lights to communicate, so I guess I was in communication with a unicellular plankton.

The Spanish explorers who discovered the bay in the 1500's, before science supplanted superstition, were terrified, thinking the light was caused by evil spirits haunting the bay. They went so far as to try to dam up the bay to keep the evil spirits confined. This was one of the few times when uninformed human effort benefitted an ecological system. By making the bay entrance shallower, they increased the residence time of water in the bay and allowed the phytoplankton population to increase to the highest concentration of all the seven or so bio-bays in the world. It also increased the temperature and the salt concentration, both of which benefitted this particular species, *Pyrodinium bahamense*.

Bioluminescence is a rare phenomenon. First, the energy required to produce visible light is high. For instance, the guide on my tour said that an individual dinoflagellate can only wink perhaps half a dozen times a night. Second, only a handful of molecules have the shape and composition to support all the steps in the process. All bioluminescent organisms use an enzyme that twists the molecule into a shape that reacts with oxygen to make an unstable product that decomposes by ejecting a photon. Let there be light!

I mentioned earlier that skimming a paddle broadside through the water created a sheet of light. An interesting detail is the fidelity of the sheet to the paddle. Where the paddle was rough, the water surface mimicked the

roughness and so did the sheet of light. This exactness reminded me of an exhibit I once saw in the Field Museum in Chicago. The exhibit consisted of two series of photographs, one of a man-made object and the other of a natural object, a raven's feather as I recollect. Each series showed the object at higher and higher magnifications. The man-made object quickly lost any recognizable pattern, showing random tooling marks and metal burrs. In contrast, the raven's feather retained an organized pattern at each level of magnification. I saw that same organization in the sheet of light.



Photo courtesy of Somos Orlando Travel

The island of Vieques is not without interest. It is the site of a welcome victory for environmentalism. When in 2000 the US Navy stopped using the island for target practice and amphibious landings training, the Federal government decided to turn over administration of the Navy's property to the Fish and Wildlife Service, rather than to the Puerto Rican government. Consequently, the island's many fine beaches have been spared from development with the usual multistoried condos and hotels, and tourism remains at a level that does not overwhelm the island's traditional culture. It is a rural island with a large, free-roaming, wild horse population. Residents tame some of the horses, and it is common to see kids riding bareback along the road or into town to

hang out with the loungers along the main drag. Also, the chicken population is prodigious; every morning at 4:30 am, the All Island Rooster Chorus begins a concert. Only

a chicken farmer could love it. For the visitors, hotels hand out earplugs! However, what an introduction to bioluminescence, pristine beaches, and fine paddling.

Oysters & Shrimp on the Menu by Frank Budny

On Saturday, April 29, 2017, 25 Master Naturalists met at the Agrilife extension office for a hands-on laboratory workshop. Three of our experienced chapter educators guided the group as they investigated the anatomy and physiology of shrimp and oysters and learned about ocean acidification which threatens their habitat.

First, Nathan Veatch provided an introduction to the shrimp most commonly found in Galveston Bay and the Western Gulf of Mexico. He talked about the life cycle of shrimp and how they spawn in the Gulf, but must make it into the bay estuary system in order to survive as juveniles before returning to the gulf as adults. He also talked briefly about the shrimping industry.

Each participant received a white shrimp and a brown shrimp for examination along with dissecting tools. Nathan showed the group how to tell the difference between white and brown shrimp, the two most common in our area. The antennae of the brown shrimp are about as long as the body and the rostral groove is long. The white shrimp's antennae are about twice as long as the body with a short rostral groove. Nathan continued his presentation with an overview of shrimp external anatomy.

Nathan then provided step-by-step instructions for dissecting the shrimp. The carapace was cut open exposing the internal organs. The gills, heart, digestive organs and reproductive organs were identified and carefully removed. Nathan also discussed shrimp reproductive systems and how to differentiate between males and females.

Next it was Bill Ashby's turn to cover the anatomy and physiology of another of our valuable sources of seafood, the oyster. He talked about the lifecycle of the oyster and how larvae, called spat oyster, need a hard substrate to attach to in the bay. He also talked about the challenges they face trying to survive in the bay, including predators like the oyster drill and lack of substrate.

Bill had shucked oysters that morning so there would be fresh specimens for the class. Each participant received an oyster. Under Bill's guidance they examined the shells and removed the right valve (shell) exposing the internals remaining on the left valve, just like an oyster is served on the half shell in a restaurant. He then led the group through an examination of the visceral parts. He had them locate the scar where the adductor muscle was

attached. This is the strong muscle that holds the two valves together. Class members identified components of the viscera including the digestive system, mantle, gills, and most interestingly, found a beating heart in a couple of specimens and a pearl in another.



Julie Massey was our third presenter. She was able to only briefly touch on ocean acidification before we ran out of time. The short video she showed covered the serious impact of acidification on current and future marine life in a humorous way. This is a subject that deserves more attention and it will be presented to Master Naturalists again when it can be given the time that it deserves.

Thanks to Nathan, Bill, and Julie for presenting a great workshop. Putting together a presentation involving real specimens requires extra preparation, but is a very effective way to learn. Those who attended this workshop now have the ability to make dinner more interesting as they can point out the internal organs of oysters and shrimp to their dining partners as they enjoy their meal.

Coast Watchers and Citizen Scientists by Diane Humes

As I write this, Hawk Watch is on its final day, with our intrepid watchers enduring relatively chilly, clammy weather conditions in the hopes of spotting the final migrating raptors along the Texas Gulf Coast. This season has been more than a little frustrating, as few birds have been seen at the La Porte sites. The target species - Broad-winged Hawks and Mississippi Kites - counted in large numbers passing through the Rio Grande Valley, made a showing here for only a few exciting days where counts reached nearly 3,000 birds!



Total counts for the season, from March 1 - April 30, at La Porte, TX were 5,206 raptors, including 869 Broad-wings and 3,729 Mississippi Kites.

Waiting for migrating hawks or sea turtles or oystercatchers or warblers requires patience and perseverance, bringing to mind the coast watchers of World War II scanning for planes and ships and other enemy activity. Those coast watchers, in constant danger and likely unable to call it off for illness or bad weather, still managed to record scientific observations - often the first official details for their environments.

For example, at the advent of WWII, the New Zealand government set up observation posts to monitor possible enemy activity and make weather and all other naturalist observations along isolated coastline areas and decided that scientists were best able to tolerate the harsh living conditions. These hardy coast watchers provided extremely valuable baseline data and some of the research stations continue to this day!

So, as Master Naturalists, keep up the good work. Count those fireflies, monitor the weather with CoCoRaHS, help the Texas Stream Team or Galveston Bay Foundation, count birds migrating, roosting, and nesting, search for sea turtles, and find invasive species. Record, publish, and learn all you can. It's what we do!

My Reflections as a New Texas Master Naturalist by Andrea Stromeyer

As of Thursday, 27 April, 2017 a goal of mine for over a year has been realized. My 2017 classmates and I have completed the initial training phase of the Texas Master Naturalist program. Some of us have completed our required 40 volunteer hours and 8 advanced training hours as well and will be receiving our dragonfly pins at the chapter meeting in June.

Let me back up to February of 2016. I was a NOAA volunteer working the Seaside Chat for the Flower Garden Banks National Marine Sanctuary. Out hanging signs before one of the chats, I directed a person wearing a Texas Master Naturalist hat to the room where the talk was to be given. I didn't think much of it until a flood of people wearing the same clothing, hats, and accessories came in to hear about lionfish on the reef. I got the opportunity to ask about the program a little later in the evening when a few members of our very own chapter were helping me clean up after the lionfish dissection.

"Wow. Forty hours of volunteer service? Eight advanced training hours? I'm not going to be able to do that with a daughter and working," I said to myself, as I scoffed at my computer after running a Google search about the program. "Looks amazing, but maybe I'll do it when life settles down a bit in the future."

The Texas Master Naturalist program remained in the back of my mind for the next eight or so months and after attending a meet-and-greet informational at the AgriLife Extension office, I decided to apply. I realized that in my life, there will never be the perfect time to do something. Either the time is made, or it isn't, but you can easily spend your life waiting for the perfect time and it never come. There will always be reasons to participate in a project or task, or not to take on the project or task, and it's up to me to decide for which projects I will allocate time and energy, and being a part of the 2017 class was not something I wanted to miss.



Photo by Chris Anastas

Prior to that first day of class, I had never been to Armand Bayou Nature Center, and the new experiences and activities didn't stop there. Over the course of those 11 total classes we got to hear from amazing speakers across multiple subjects about conservation in Texas. I have learned about prairie grass and how fire is used to control invasive species and promote the health of the grasses. We got up close and personal with alligators out on the bayou, got hands-on with a squid during a dissection, observed plankton through a microscope, and learned that hedgehogs aren't native to Texas. We pulled seines through the water and then engaged local children during a spontaneous outreach opportunity at Galveston Island State Park. Surprisingly, I developed an interest in

birds and birding during a hike through the beautiful rookery on High Island.

The Texas Master Naturalist program has changed my life. I see my neighborhood in a totally new light and have a newfound appreciation for the nature right in my own backyard. I drive north on I-45 and see areas where urban wetlands could be built, and then explain to my daughter that urban wetland areas are ideal for flood control. I look at the prairie potholes and wonder how we can best utilize our resources to protect these areas. I have been diligent about making choices that better support the health of the watershed, and it's been a solid seven weeks since I have used a straw in my drinking glass.

My personal style has evolved as well. It has transformed from jeans and t-shirt and sneakers, to dive booties or boots, zip-off pants, a fishing shirt, and a hat. I'm missing a good pair of binoculars and more drab clothing.

I would be remiss if I didn't extend a major thank you to the Galveston Bay Area Texas Master Naturalists, the Board of Directors, the 2017 training class committee, my mentor Dianne Forthman, and my classmates (I'm going to miss you all on Thursdays). Thank you to all of the speakers, presenters, and the venues at which class was held. As a Texas Master Naturalist, I plan to put the skills and knowledge gained over the course to pay it forward. I am especially looking forward to working alongside the Board of Directors, Janet Mason, and Patty Trimmingham as an alternate class representative. The work of the Texas Master Naturalist is critically important and I am honored to be a part of it. After all, if we don't conserve the natural areas of Texas and teach others how to do so as well, who will?

Fireflies of Summer by Diane Humes

Most children we know have never seen fireflies.

Call them fireflies or call them lightning bugs; fireflies are beetles. In the family Lampyridae, fireflies produce a chemical reaction creating their characteristic light - bioluminescence - in specialized organs. They also make toxic and distasteful chemicals - lucibufagins - similar to the toxic steroids found in *Bufo* toads. Some fireflies also feed on milkweeds, possibly loading up on the same cardiac glycosides as Monarch butterflies. Who knew?

Firefly bioluminescence, in addition to being their mating display, appears to serve as a warning signal to predators, especially in larvae, saying, "Watch out, we taste bad." In addition, just to make things more complicated and interesting, firefly mimics, such as

moths, cockroaches, soldier beetles, net-winged beetles, and longhorn beetles, escape predation by copying the appearance of the, presumably, distasteful fireflies. However, some mimics produce their own chemicals and it is not known that *all* fireflies are poisonous.

Definitive firefly characteristics are: soft bodies, a flattened shield on the back of the head, and bioluminescence in at least the larval stages of their life cycle. As with all other beetles, fireflies undergo complete metamorphosis, moving through egg, larva, pupa, and adult stages. Said Lynn Faust, "Generally, fireflies spend two to three weeks as eggs, one to two years as larvae, one to three weeks as pupae, and only three to four weeks as adults."

Larvae are predators, mostly living underground; they are "beetle grubs," hunting snails, worms, slugs, caterpillars, cockroaches -- whatever they can get. They can inject numbing agents into their prey, eating it without the prey even knowing it is being consumed! Larvae are eating specialists, their last act being to find the right spot to pupate.

The most common North American fireflies belong to three genera, comprising about 75 species: *Photinus*, about one-half inch long producing yellow flashes, *Photuris*, larger, almost an inch long, with green flashes, and *Pyroctomena*, with a yellow orange flicker like a campfire spark.

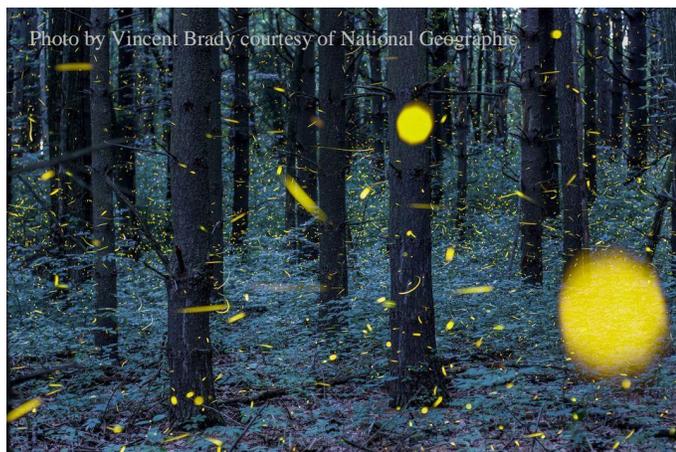


Photo by Vincent Brady courtesy of National Geographic

Firefly species all like standing water and live near ponds, lakes, rivers, puddles, ditches, and marshes. They live in warm, humid places; worldwide there are more than 2,000 species, with 350 species in Brazil, compared with North America's about 120 species. In the U.S., the southeastern states have the most firefly species, particularly Georgia and Florida.

Fireflies love long grass -- as perches for mating and for protection during the day. Many firefly species are extremely site-specific, flashing and mating in the same locality over many years. *Photinus* adults are weak fliers and larvae are subterranean. It is possible that they never travel more than a few meters from where they were deposited as eggs. So, soil disturbance due to construction, pavement, or conversion to agriculture may disrupt established breeding populations that may never recover or relocate.

Are fireflies disappearing? Nobody knows for sure, but reports from around the globe suggest declining numbers everywhere.

Although my neighborhood adjoins Armand Bayou Nature Center where fireflies are already flashing their nightly nuptial lights, I have never seen a firefly in my

yard. In theory, about 20 of the 38 species calling Texas home live within a 60-mile radius of Houston; however, they are rarely seen these days.

"You had 'em in Houston before they built the city on top of 'em and paved it over," says Jim Lloyd, professor of entomology and firefly expert at the University of Florida. "Fireflies are going extinct."

I first wrote about fireflies in 2009, thinking I had all the information. However, researchers have learned a great deal about fireflies and I can highly recommend two new books with fascinating information about fireflies for your summer reading pleasure. For great reads, check out: *Silent Sparks: The Wondrous World of Fireflies* by Sara Lewis, Princeton University Press, 2016 and *Fireflies, Glow-worms, and Lightning Bugs: Identification and Natural History of the Eastern and Central United States and Canada* by Lynn Frierson Faust, University of Georgia Press, 2017. See also: *The Midden*, August 2009 for basic firefly info.

To learn the latest and help scientists, join Firefly Watch and add your Citizen Science data to the map being compiled by the Museum of Science in Boston. <https://legacy.mos.org/fireflywatch/>

The fireflies of Woldumar Nature Center, seen here, flash in my old stomping grounds, where I was lucky enough to learn about conservation and ecology in 8th grade. Be sure to take someone you know outside to enjoy a firefly display, perhaps in your own backyard.

The Midden

Published bimonthly by the Galveston Bay Area Chapter - Texas Master Naturalists. The purpose of *The Midden* is to inform, communicate and educate chapter members and the community. If you have an article that contributes this purpose or want to join the team, please contact Diane Humes, treimanhumes@gmail.com.

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The Midden is posted on the GBAC-TMN chapter website: www.gbamasternaturalist.org two weeks prior to chapter meetings. Archived issues also on chapter website. If you prefer to receive *The Midden* in hard copy and are not currently receiving it, please contact: Julie Massey, julie.massey@agnet.tamu.edu.

Midden Team

Madeleine K. Barnes	Linda Welzenbach Fries
Lana Berkowitz	Carolyn Miles
Verva Densmore	Chuck Snyder
Diane Humes, Managing Editor	

June and July Activities

ADVANCED TRAINING OPPORTUNITIES

Chapter Meeting - June 1; History of TX Game Wardens
Presenters - Jennifer Provaznik, Texas Game Warden
6:30 Social, 7:00 Meeting, 7:30 Speaker
AgriLife Extension Office; 1 AT hours

Ongoing

Galveston Island State Park

10 am at the Welcome Center

Every Saturday- Beach Explorations

Every Sunday- Bay Explorations

Tours 1 to 1 ½ hours long. Bring water and family.

Heritage Book Study Group

First Monday of every month. AgriLife Extension Office

10am-Noon; 2 hours AT

Contact: Elsie Smith (409) 392-7003

See Pg. 6 for meeting dates and books.

STEWARDSHIP OPPORTUNITIES

Ongoing Activities:

Mondays - Galveston Island State Park, Contact: Chatt Smith chattsmith@gmail.com

Tuesdays -

- Sheldon Lakes State Park, Contact: Tom Solomon crandtr@sbcglobal.net
- Texas City Prairie Preserve, Contact: Jim Duron wishkad@yahoo.com
- Environmental Institute of Houston at UHCL, Contact: Wendy Reistle reistle@uhcl.edu

Wednesdays - Wetland Restoration Team, Contact: Marissa Llosa mllosa@tamu.edu

Thursdays -

- Stormwater Wetland Team, every Thursday, 9 - Noon. Contact: Mary Carol Edwards mary.edwards@agnet.tamu.edu
- San Jacinto State Park, Contact: Jim Duron wishkad@yahoo.com

Fridays - Prairie Friday, ABNC, 8:30 - 11:30am, Contact: Chatt Smith chattsmith@gmail.com

EDUCATION - OUTREACH VOLUNTEER OPPORTUNITIES

Bay & Island Adventures - Volunteers teach six in-class hands-on modules on a once a month basis in Dickinson and Galveston Schools. Presenters and helpers are

needed for eleven 4th and 5th grade classes. Contact: Sara Snell snellsw@verizon.net.

Education and Outreach Committee - Lots of work to do and we can use your help developing a speakers bureau; responding to requests for exhibit booths, fieldtrip guides and presenters, planning Camp Wild and Treasures of the Bay; and developing a library of education-outreach materials. Contact Sara Snell snellsw@verizon.net

Partner and Associate Programs - Many organizations sponsor guided walks and education programs or need volunteers to staff their nature center. Go to <http://txmn.org/gbmn/partners/> for the list, then click on the link to the organization's website.

BOARD AND COMMITTEE MEETINGS

(At Extension Office monthly unless specified)

Board Meetings - First Tuesday, 2-4pm

Committee Meetings

Communication - June 26, 9am-Noon

Advanced Training - Third Monday, 10am-Noon

Education/Outreach - Third Tuesday,
10 to 11:30am

Stewardship - Meets quarterly.

The Midden Deadline

for the next issue

June 23

If you have Advanced Training or Volunteer Opportunities, please submit information to Ron Morehead, ronmorehead@yahoo.com



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Educational programs of the Texas A&M AgriLife Extension Service are open to all people without regard to race, color, sex, religion, national origin, age, disability, genetic information, or veteran status. The Texas A&M University System, U.S. Department of Agriculture, and the County Commissioners Court of Texas cooperating