



Alligator by Mike Wehrman

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**President's Corner** by Pam House

Recently I heard an interview with the artist Sandra Boynton and the cellist Yo-Yo Ma talking about their recent joint project called "Jungle Night." Part of the discussion concerned the joy of introducing new things to children. As they said, the mind of a child was a clear chalk board and "starting anew every time."

I think most master naturalists retain that childlike wonder with their discoveries in the natural world. At Hawk Watch, most of the participants had seen the migrating raptors many times before. For those, like me, who were seeing the kettles of migrating raptors for the first time, it was thrilling. But, in truth, the old hands still gasped with awe and excitement, as if seeing them for the first time, as they passed.

The wonder can come from unexpected places or topics. Perhaps it is not surprising that many of our members are participating in the sea turtle patrols and aiding with turtle rehab and recovery with excitement and joy. But that a presentation on lichens, such as that given at last month's chapter meeting, could prove to be funny, entertaining, and fascinating says something about the enthusiasm of the presenter (Dr. Manuela dal Forno) and the youth of the audience, however old in calendar years.

Perhaps that is one reason that the chapter members have coped so well with the changes demanded of us by the COVID19 restrictions. If we view challenges as an opportunity for fresh experience, then they can be welcomed rather than resented. The amazing Zoom team has allowed learning and fellowship to continue even as we have been physically distanced. And we are just beginning to see the opportunities to gather as a group come about. If you missed Mel's Sidewalk Sale on April 24, you should try to stop by next month (May 22). It was not only great to be able to pick up some master naturalist booty, but the glee at getting to physically greet each other was palpable. I felt like dancing in the street.

Our next chapter meeting is scheduled for June 3 and still planned to be on Zoom. We'll be continuing our anniversary celebrations and offering another opportunity for discovery via Sam Kieschnick's sharing of the wonders of moths. I hope to see you there ready to start anew.

20<sup>th</sup> Anniversary t-shirt on sale at Mel's Sidewalk Sale.



**Next Chapter Meeting**

June 3

Moths of Texas

By

Sam Kieschnick

Urban Wildlife Biologist  
TPWD

Via Zoom

## Wetland Wanderings: Caterpillars in the Water by Lana Berkowitz

Wetland wanderer Diane Humes and her work buddies thought a caterpillar in a wetland pond at Exploration Green was in danger of drowning.

“We felt sorry for the first one, but when we kept seeing them, I decided they belonged there,” Diane said. A bit later Diane heard Sam Kieschnick, urban wildlife biologist for Texas Parks and Wildlife in the Dallas-Fort Worth area, mention aquatic caterpillars during his moth talk at the state meeting.

“There are only a few kinds of moths that I can think of that have aquatic larvae. But the ones in the genus *Petrophila* are the ones that come to mind right away,” Sam said in a followup after his talk. *Petrophila* is in the Crambidae family (Crambid snout moths).

Crambid snout moths are widespread with a variety of lifestyles. A few species have caterpillars that used silk webs to anchor them in running water so they can feed on algae. And some crambid species build leaf and silk tubes in calmer waters to feed on aquatic plants such as duckweed. Like their terrestrial cousins, aquatic caterpillars are scrapers using large mandibles for feeding and leaf shredders.

*Peterson Field Guide to Moths*, which Sam recommended, lists aquatic crambids such as pondside crambid, waterlily borer, black duckweed moth, waterlily leafcutter moth, floating-heart waterlily moth, watermilfoil leafcutter moth and hydrilla leafcutter moth.

While they may be called aquatic moths, water is home for only the younger stages of life. The adults are terrestrial with fully developed wings.

While aquatic moth larvae have been found throughout the world, including in a Black Sea lagoon and around the Galapagos Islands, little is known about their life cycle. Research is lacking on aquatic moths mostly because they are nocturnal and there are so many other butterflies, skippers and moths to study in the order Lepidoptera.

“Aquatic and semi-aquatic moths represent only a tiny fraction of the total lepidopteran diversity. Only about 0.5 percent of 165,000 known lepidopterans are aquatic. Truly aquatic species can be found only among the Crambidae, Cosmopterigidae and Erebidae, while semi-aquatic forms associated with amphibious or marsh plants are known in 13 other families,” writes Krzysztof Pabis, Ph.D., an entomologist at Poland’s University of Lodz, in his 2018 research paper.

Usually associated with stagnant water or slow-moving rivers, aquatic caterpillars are normally found on algae-covered surfaces or plants they feed on.



Photo courtesy of iNaturalists/mhalsted

Eggs for the aquatic caterpillars are found on the undersides of floating vegetation, stems, rocks and other places below the water’s surface. Some moths deposit eggs by dipping their abdomens into the water. Others may dive to lay their eggs on rocks. Most aquatic caterpillars go through the pupal stage in the water. Like their parents, the caterpillars are mostly active at night.

Except for a couple of exceptions, they don’t swim. However, they can be spread by relocating plants, including those imported for use in aquariums. The china-mark moth larvae are considered pests by those who value their waterlilies.

Identifying larvae is so hard that some researchers follow the caterpillar to its adult stage to name the species.

“Aquatic and semi-aquatic moths are probably one of the most poorly studied ecological groups within the Lepidoptera. The potential for various studies on their ecology and evolution is great and untapped,” Dr. Pabis said.

And here’s some good news: Sam Kieschnick will be the featured speaker at the June chapter meeting via Zoom. His topic is “Moths of Texas,” so save all your moth questions for him.

Citation: Pabis, Krzysztof. (2018). What is a moth doing under water? Ecology of aquatic and semi-aquatic Lepidoptera. Knowledge and Management of Aquatic Ecosystems. 2018. 10.1051/kmae/2018030.

## Prairie Ponderings: Spring Ladies Tresses by Diane Humes

A sure sign of spring is spying a lovely white spike of spring ladies tresses (*Spiranthes vernalis*) blooming on the prairie. These beautiful plants are some of the most common of the 54 species of orchids living in Texas.

Texas prairies are tough places to live. Plants, animals and people have to survive scorching heat, high humidity, drought, floods, wildfires, wind, hail, sleet, snow, ice, hurricanes and tornadoes – possibly all on the same day! Animals and people are able to seek shelter; plants cannot. How do they manage? Even more, how do delicate-looking orchids thrive on the prairie?

The orchids – Orchidaceae – belong to the largest of flowering plant families, although the asters – Asteraceae – are also in the running for top honors. Certainly tougher than they look, orchids, with 28,000 species in 763 genera, have adapted to life in every habitat on Earth except glaciers.

Orchids are monocots with simple, parallel-veined leaves, often forming a basal rosette. Distinguishing characteristics are: bilaterally symmetrical flowers with three sepals and three petals, but one petal is quite different from the other two, forming a labellum, or “lip” which may function to attract insect pollinators. Stamens and carpels are fused; the ovary develops into a capsule enclosing up to a million microscopic seeds – think dust or spores. Most orchid seeds require a mycorrhizal fungal association to germinate.

The genus *Spiranthes*, with 42 species from temperate North America and Eurasia, includes 13 species native to Texas: Texas ladies tresses, Florida ladies tresses, nodding ladies tresses, Southern slender ladies tresses, lace-lip ladies tresses, giant spiral orchid, Great Plains ladies tresses, fragrant ladies tresses, oval ladies tresses, Navasota ladies tresses, giant ladies tresses, little ladies tresses, and spring ladies tresses.



Photo by Larry Allain,  
U.S. Geological Survey

None other than Ferdinand Lindheimer collected spring ladies tresses on Galveston Island and sent the specimen to George Engelmann and Asa Gray who first described the species in 1845. It is distinguished from other species of *Spiranthes* by having fine, pointed hairs covering the white flowers and a yellow center on the lip. Pollinated by bumblebees, flowers spiral upward in a single tight file on the stalk – usually 2 feet or more in height.

Look carefully. Spring ladies tresses can be found in many eastern Texas habitats and often along roadsides. This species is a pretty good indicator of undisturbed prairies, with a coefficient of conservatism of 6 (on a scale of -3 to 10).

Imagine my surprise and delight when I found several plants growing in the median on Middlebrook Drive at Bay Area Boulevard near the Lunar & Planetary Institute. Did lawnmowers spread the seed from another location? Or the wind? Is this a little prairie remnant? All possible; we do live on the Coastal Tallgrass Prairie.

## Coastal Corner: Jellyfish of the Texas Coast by Sharon Evans

As we are walking on the beach or swimming in the Gulf, we will occasionally come across a jellyfish or one of its relatives. Probably the first thought to come to our minds is, “Does it sting?” Some jellyfish do sting, but not all jellyfish can harm us.

Jellyfish are free-swimming marine organisms with trailing tentacles possessing nematocysts - specialized “stinging cells” activated by touch to inject venom. Used by the jellyfish to ward off enemies or capture prey, the stings can cause us redness, irritation, blistering of our skin and, sometimes, more adverse reactions.

Nematocysts can activate in the water or out on the beach, whether or not the tentacles are still attached to the jellyfish. Beware and be careful.

Preventing jellyfish stings is as simple as keeping yourself covered with long sleeved shirts and long pants or staying out of the water when the jellyfish are present. However, if you are stung, you can use a credit card to flick off any tentacles that might still be clinging to your skin. Then apply vinegar (helpful for box jellyfish stings, but not Portuguese man o’ war) or unseasoned meat tenderizer, such as Adolph’s, to the area. Hydrocortisone

applied locally may reduce pain and inflammation; antihistamines may help control itching. Seek medical attention for severe reactions.

Aside from millions of nematocysts, jellyfish are fairly simple invertebrates in the Phylum Cnidaria. Their bodies are about 95% water. They lack brains, hearts, blood, and have a basic nervous system called a nerve net. Their body has 3 layers - the outer epidermis, the jelly-like middle layer called mesoglea, and the inner layer called the gastrodermis. The single cavity inside the jellyfish is their digestive system, with only one opening where food goes in and wastes go out.

The jellyfish's life cycle is quite complex and involves multiple stages. The medusa is the familiar form of an adult jellyfish and it reproduces sexually. Males release sperm into the water, which then enters the female where fertilization occurs. Eggs become free-swimming larvae drifting on the currents until they find a place to land. Once anchored, larvae develop into asexually-reproducing polyp forms. The copies of the polyp will bud off to grow to become free-swimming medusae. And the cycle continues...

There are at least 2,000 species of jellyfish worldwide, with 6 fairly common (and beautiful) jellyfish on the Texas Gulf Coast that we might come across.

Cabbagehead or Cannonball Jellyfish (*Stomolophus meleagris*) - Class Scyphozoa - usually no sting to humans



Photo courtesy of TPWD

Portuguese Man-of-War (*Physalia physalis*) - Class Hydrozoa (not a jellyfish, but a colony of organisms that work as a single unit) - very painful sting but rarely deadly



Photo courtesy of TPWD

Blue Button (*Porpita porpita*) - Class Hydrozoa - mild or no sting on humans

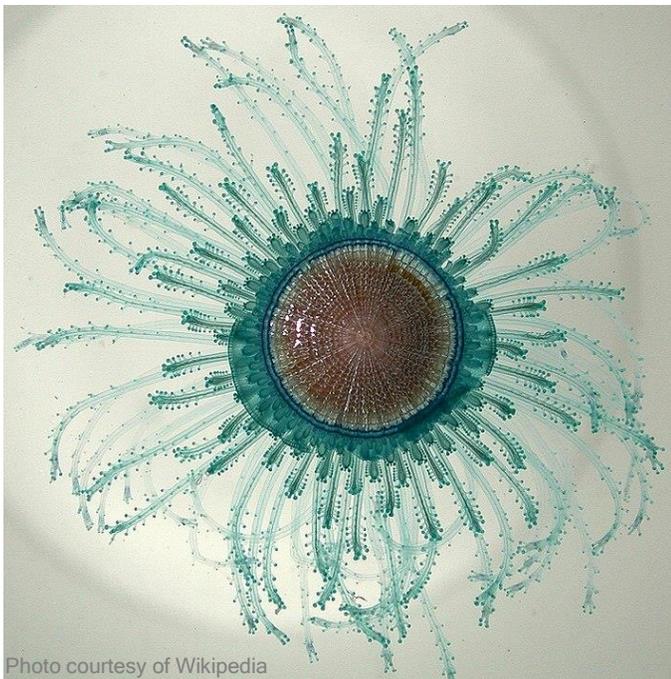


Photo courtesy of Wikipedia

(FYI - Other common "non-jellyfish" are comb jellies, with many species all in the Phylum Ctenophora. They have no stinging effect on humans.)

By-the-Wind Sailor (*Veleva veleva*) - Class Hydrozoa - no stinging effect on humans



Photo courtesy of National Park Service

Moon Jelly (*Aurelia sp.*) - Class Scyphozoa - mild sting and skin irritation



Photo courtesy of National Park Service

Sea Nettle (*Chrysaora sp.*) - Class Scyphozoa - sting can produce a painful rash



Photo Courtesy of National Park Service

## Chapter Volunteer Service by Susette Mahaffey

This year's 20<sup>th</sup> Anniversary chapter celebration is a time to pause and think about the difference we have made to the environment and people around us. Through the work we do, we are leaving a legacy for the future. By restoring ecosystems, future generations may see them as closely as possible to their original state. By monitoring wildlife, we aid in its survival. More so than other chapters, it seems that we have a huge variety of opportunities for volunteer service, thanks to a plethora of partner and associate organizations and diverse array of ecosystems.

Our partner organizations benefit the chapter, usually by providing volunteer training, in return for volunteer service on selected naturalist projects that have been approved by the chapter's Board of Directors. Associate organizations are those for which chapter members perform volunteer service on approved projects but receive no benefits. In all we have about 35 different opportunities from which our members may choose to do volunteer service.

The list of approved volunteer projects may be found on the chapter website; if you wish to volunteer at another site, fill out the form for seeking a new opportunity and send it to Jo Monday, director of the Volunteer Service Committee, for approval. Contact Patty Trimmingham for help navigating the VMS system for reporting hours. When in doubt about a volunteer opportunity, ask Jo or Patty! They have a wealth of knowledge to share with each of us.

Each year the Texas Master Naturalist program uses your logged volunteer hours as 'in kind' service to apply for a federal matching grant. Funds received pay for salaries and to support the services that chapters receive

from the state. **As of April 2021, each hour that you log is valued at \$28.54!**

However, your time really has a greater value and impact when you look around and see the difference that you make each time you volunteer. For that volunteer time, thank you not only from the chapter membership but also from those people who benefit from your service and dedication!

"You cannot get through a single day without having an impact on the world around you. What you do makes a difference, and you have to decide what kind of difference you want to make." **Jane Godall**

### *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](mailto:treimanhumes@gmail.com).

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*The Midden* is posted on the GBAC-TMN chapter website: <https://txmn.org/gbmn/> 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@ag.tamu.edu](mailto:julie.massey@ag.tamu.edu).

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## Volunteering by Dick Benoit

Continuing our 20th anniversary trip down memory lane, please consider Dick Benoit's words regarding volunteering from *The Midden*, June/July 2005.

### Four Years and Five Thousand Hours Ago

*By Dick Benoit, Chapter President*

The Galveston Bay Area Chapter - Texas Master Naturalist was formed four years ago.

The first of seven classes was completed in fall of 2001 followed by classes in spring 2002, fall 2002 and spring 2003. Training took a break in fall 2003 to develop the Chapter Enhancement Committee. Classes resumed in spring 2004 followed by fall 2004 and our last class in spring 2005. The Board decided to take another breather this fall to allow time for more chapter development.

The Chapter now has about 150 trained Texas Master Naturalists. The growth and development of the Chapter has remained focused on our purpose and mission to conservation, preservation, and restoration of our natural resources and promotion of ecological education. We have provided and/or assisted in community programs and projects that have increased our appreciation of our natural environment. The chapter has promoted and maintained use of public open spaces, and protected and preserved native flora and fauna and their habitats.

If we as a chapter or individually were to do a pie graph of the volunteer service hours and advanced training time spent we could be assured that our graph would reflect our focus on our mission and purpose.

Recently I have completed my first five thousand volunteer hours as a Texas Master Naturalist. I was in the first graduating class of Gulf Coast Master Naturalist in the fall of 1999. My motivation has been threefold. My education, career, and family had a service component and it was only natural to seek to serve in an area of special interest -- the environment.

Second, in today's society the aging are seen as a burden and non-productive. Those in the younger segment are working and becoming educated while we have the time available to take up the task of being caretakers of our environment. At \$17.22 an hour, in a year's time through volunteer hours we contribute more to the economic/environmental system than we are taking out in Social Security. Clearly, as Master Naturalists we are a net asset, not a burden.

Last, but certainly not least, we would like to leave to our children and grandchildren an environment that is better than the one we inherited.

## Chapter Disaster Plan by Mike Pettitt

The GBAC-TMN Board is establishing a plan to monitor and respond to effects of major storms/disasters upon our members. This is not an emergency response endeavor. We do not have the personnel, equipment, or training for such a response. For emergencies dial 911.

What we can do is lend a hand to our members who may need some help in the aftermath of a local disaster.

Each of the 12 voting members of the Board will be charged with communicating with a subgroup of our

membership. Your assigned Board member (or a designated alternate if your Board member is indisposed) will be your contact.

If this plan is activated, you will be notified via Constant Contact, that is, an email to the chapter telling you that the plan is activated. Also, when response is possible, your Board member will contact you via email, text, or phone call. When contacted, please acknowledge that you are secure and in no need of assistance, or, if you

need assistance, what response you request. In addition, if you are secure please advise if you are willing and able to respond to another's needs, if requested.

It is apparent this plan relies on good communication. During our Valentine's Day cold snap, I had neither internet nor cell service for about a day and a half. We each need to be ready with essentials during our crazy weather events. I hope this plan will be useful in helping each other through challenging times.

## Diane Humes Earns 15,000 Hours by Meade LeBlanc

Please offer your congratulations to Diane Humes for achieving the incredible milestone of 15,000 hours of volunteer service (equals over seven years of full-time employment)!

Diane completed her master naturalist training in 2000 and credits Dick Benoit with getting her involved in many of her earliest activities with the chapter, including the Wetland Restoration Team and the Prairie Restoration Team at Armand Bayou Nature Center. Diane has participated in water testing activities with Galveston Bay Foundation for the past 10 years. She is a deckhand on the pontoon boat at Armand Bayou Nature Center and an avid volunteer at Hawk Watch. She has served in many leadership and committee positions including serving as chapter president for 3-years. Diane also writes articles and edits the Midden.

Speaking about her association with the chapter, Diane said she wanted to find like-minded individuals who really care about the environment and think the same way. It was "really neat to have the master naturalist chapter appear right before me."



## Return of the Cicada Killer Wasps by Rebekah Gano

Last summer, my family and I were on our way to swim at a friend's pool when I received a text message saying wasps were swarming near the pool. The next message stated that we could still swim and shouldn't be alarmed; the wasps appeared every summer and didn't bother people. Sure enough, when we arrived, there were large yellow and black wasps perching and flying along the vegetated side of the pool. And, just as promised, the wasps left us alone. They didn't even come to the edge of the pool to drink the water we splashed, as other wasp species regularly did. What sort of hulking but peaceful wasps were they? Cicada killers.

Cicada killers (*Sphecius speciosus*) are some of North America's largest wasps, with females reaching up to two inches (50mm) long. In fact, they are so large, that in

early summer 2020 they were reported as Asian "murder hornets" by some Texas residents. Texas Parks and Wildlife has not confirmed any cases of the invasive Asian hornets and reassured residents and news stations that they were seeing a native species that was very unlikely to harm humans, pets, or livestock.

As solitary wasps, cicada killers don't share nests with others, but they often live in close proximity to each other. The males usually emerge from the ground first and congregate in the nesting area, waiting for a mate. Male cicada killers spend much of their time defending territories and chasing one another, much like carpenter bees. Also like carpenter bees, they have no stingers but appear very imposing.

Female cicada killers typically have no nest-defending instincts, but they are busy in the area with other activities. According to the National Wildlife Federation, after mating they tunnel into soil. Soft and sandy soil is best because their burrows may be from ten inches to four feet long, and each tunnel contains separate cavities for about 15 eggs.



Once the burrow is complete, the female hunts for cicadas. Adult cicada killer wasps do not eat cicadas; the adults have a placid diet of nectar and sap, but their young need different nutrients. Scientists believe the wasps locate the camouflaged cicadas by sight. Once the prey is located, the female stings the cicada, paralyzing it, and lugs the still-living creature (much heavier than herself) into the burrow for her offspring. The Smithsonian Institute and other observers have noted that cicada killer wasps will often climb higher with a cicada in order to glide with it closer to their nest. They then have to expend less effort dragging the large insects along the ground.

The female cicada killer places one cicada in some chambers and two or three in others. If the offspring is to be a female, it needs two or three cicadas because females are so much bigger. Males will hatch from the cavities with only one cicada. After stashing many cicadas in her burrow, the female lays an egg in each cavity and seals the entrance. She will die shortly after laying her eggs. It takes only two or three days for an egg to hatch. The larvae stay in their underground burrows and eat for about ten days before they pupate. At the end of the summer, by the time the cicadas are gone, the cicada killer wasps are too. However, just like the cicadas, the wasps are waiting underground for warmer weather, and they will emerge again the next summer.

## Women in Nature: Lady Bird Johnson by Meade LeBlanc

Congress designated April 2021 National Native Plant Month - the month of spectacular wildflowers in Texas. Wildflowers are synonymous with the Wildflower Center in Austin, started by a native Texan woman named Claudia Alta Taylor at birth, and Lady Bird Johnson in later life.

Her nickname was famously given by a nursemaid who proclaimed that she was pretty as a ladybird, and for the rest of her life, she was called Lady Bird by most people, or Lady by her father and siblings, or Bird by her husband, the name she used on her marriage license.

The nickname was prophetic. Lady Bird became a great force for conservation, involved in many environmental projects. She focused her earliest efforts on beautifying the nation's capitol. Believing that beautification encompassed more than pretty flowers and trees, she created the Society for a More Beautiful National Capitol to work for clean water, clear air and preservation of parklands for the inner cities, as well as the areas of the city more often visited by tourists.

Her attention went national, leading to The Highway Beautification Act of 1965, nicknamed Lady Bird's Bill. This law controlled billboards and junk yards in order to

increase scenic beauty along the interstate highway system and was a signature accomplishment. More than 200 beautification and conservation laws were passed and 47 national parks established during the Johnson administration, likely with her involvement.



Photo courtesy of U S National Archives

Many of her activities took place closer to home. She was involved in the Town Lake Beautification Project, which created hike and bike trails planted with flowering trees along the Colorado River in Austin. In 1969, Lady Bird founded the Texas Highway Beautification Awards and spent twenty years hosting the annual awards ceremonies.

Born in 1912 near Karnack, Texas (population 100) not far from Caddo Lake, she lived in an antebellum plantation house. Her father was a wealthy businessman with 15,000 acres of cotton and two general stores. Lady Bird learned to love the outdoors as a child in the tall pines and bayous of East Texas, walking, fishing, swimming, paddling under the cypress trees and watching the wildflowers bloom each spring.

Wildflowers played a part in her college years, as well. She enrolled in the University of Alabama for a year but became homesick. She chartered a plane to return home

and to visit a friend attending the University of Texas at Austin. As the plane landed, she looked over the fields of blooming wildflowers and decided to attend college there.

Wildflowers play a starring role in her most visible legacy. Lady Bird, along with actress Helen Hayes, founded a National Wildflower Research Center in Austin in 1982. Officially renamed the Lady Bird Johnson Wildflower Center in 1997, it has evolved into a major research center and botanic garden.

In an article in the Organization of American Historians' *Magazine of History*, historian Rita G. Koman said, "Lady Bird Johnson's legacy was to legitimize environmental issues as a national priority. The attitudes and policies she advanced have shaped the conservation and preservation policies of the environmental movement since then."

## Bottled Water: What's in yours? by Sally Pachulski

**Do you drink bottled water?** Read this, the headline screamed. And even as I started reading the article on my computer (how could I ignore this?) I felt I knew what it was going to say. I was right, to a point, and then the article veered off into a whole different ballgame. It left the scary news of how many water bottles aren't getting recycled and took a totally different track. It was frightening. And it led me down a rabbit hole seeking more information.

**The good:** Bottled water can be a godsend and a necessity when safe water is unavailable. Ask the people of Flint, Michigan or the many Texans who were caught unprepared for the widespread water outages that occurred during the Big Freeze of this past February. When I lived in Mexico, our tap water was contaminated and we joined our neighbors in waving down the water truck passing by our house with a booming Agua, Agua broadcasting from the loudspeaker perched on the cab. We would purchase huge 10-gallon plastic water bottles that we drank from, washed our food with and used for cooking. There was a small deposit paid on the plastic jugs, and they were exchanged for full bottles weekly with the jugs always being reused.

**The bad:** What about when it's not safety but convenience that is driving our choice? I'm headed out with a friend on a long road trip tomorrow and as I'm shopping for "road food," I pick up several bottles of water so we can stay hydrated on the trip. But what happens to the bottles afterward? I try to be responsible, but sometimes on the road it's hard to find a recycling bin. I try, but sometimes convenience overrules!

Plastic water bottles are recyclable, but Americans throw away about 80 percent of those they use (hopefully in the trash) or as many as 1,500 bottles every second by some estimates. According to Food and Water Watch, in 2016 the bottled water industry used about 4,000,000,000 (yes, 4 billion) pounds of plastic for bottles.

All of these discards break down into microplastics and they are, quite literally, everywhere - in the environment, in our wildlife, in our food. An article in the Dec. 23, 2020, issue of Business Today cited a study that reported the shocking news that microplastics were even being found in the placentas of unborn babies. And this just deals with the bottle. Now let's examine the contents.

**Did you know?** Bottled water may not be as safe as your tap water; but your tap water can contain some nasty chemicals, too.

We assume that bottled water is safer to drink than tap water. Overall, studies don't find much of a difference. But there is also a chance that the water coming from your tap is safer than the bottled water. Your municipal water supply must meet requirements set by the EPA which some consider safer than the standards your bottled water, which is monitored by the FDA, needs to meet.

What should we know before purchasing bottled water? Find out where it came from and what's in that water. In 2004 it was estimated that 25 percent of all bottled water

consumed in the U.S. came from municipal water supplies and, according to the environmental website EcoWatch, by 2018 that amount had swelled to 64 percent! And that bottled water, from the same source as someone else's tap water, costs approximately **2,000 percent** more than your tap water!

**Did you know?** Bottled water may be costing you 2000x as much as your tap water.

**The emerging ugly for all drinking water:** There is a growing awareness that many bottled waters contain some very nasty contaminants. PFAS, a group of thousands of industrial chemicals, have been found in both tap and bottled water.

The CDC describes PFAS *as a group of chemicals used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. They are found in clothing, furniture, adhesives, food packaging, heat-resistant non-stick cooking surfaces, and the insulation of electrical wire. Many chemicals in this group have been a concern because they do not break down in the environment, can move through soils and contaminate drinking water sources, and build up (bioaccumulate) in fish and wildlife. PFAS have been found in rivers and lakes and in many types of animals on land and in the water.*

While there is currently no federal guidance on regulation, the most studied forms have been found to be carcinogenic and linked to liver damage, thyroid disease and risks to pregnancy in humans. The CDC lists even more possible problems. The Center for Scientific Evidence in Public Issues states that PFAS have been found in the blood of over 98 percent of all Americans. Forty-nine states, including Texas, are known to have PFAS contamination in some of their municipal water systems, while concerning levels have been found in many of the bottled water lines.

Reduction of single use plastics has been important to me and, as a member of the Green Team, I have worked to offer solutions within the chapter for eliminations of SUPs at chapter-wide events. Because the tossed water bottle is ubiquitous and seen by everyone on a daily basis, I have worried about the effects the microplastics resulting from their breakdown might be having on

humans and wildlife. Now I find that the water itself is something to be concerned about. How are the contaminants affecting living creatures? The effect of both microplastic in the environment and contaminated water are issues of concern for master naturalists.

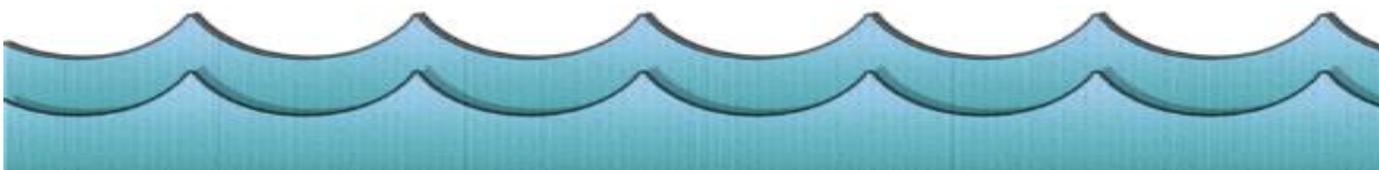
**What can you do? What have I done?** The decision to reduce bottled water in my life came easily; the harm to the environment and the cost outweighed the benefit. The question about where my bottled water was coming from and what could be in it sealed the deal.

Sure, there may be times when I will be using bottled water - like during a hurricane when I don't have electricity, need to boil my water and somehow haven't prepared by having water set aside. But I also plan to take bigger steps by encouraging my municipality to test (and release the results) for PFAS. Bottled water companies should do the same.

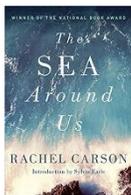
I also plan to have my home water tested. If it's found to be contaminated, I may invest in a home filter system. A 2020 study by researchers at Duke University and North Carolina State compared contaminant levels remaining in water filtered through pitchers, in-fridge devices, under sink reverse osmosis and two-stage filters and whole house systems. Reverse osmosis systems and two-stage filters were best as they removed nearly all the PFAS chemicals in the study. Unfortunately, the used filters will still contain the PFAS and the only way to safely dispose of them is in an industrial incinerator. For now, that poses some big problems as most of us don't have access to these incinerators.

**Did you know?** About 80% of plastic water bottles are not recycled, adding to landfills, introducing macro and micro pollution to the environment, and posing health risks to ecosystems and humans.

Obviously the environmental impacts of bottled water are huge. The discarded bottles are breaking down into microplastics that are eventually ingested by humans and wildlife. Those bottles may have contained contaminants that will stay in the environment forever. My tap water may be safer than the bottled water. This is definitely a matter that needs serious consideration! At this time, it seems the best prevention is to know what you are drinking and act accordingly!



## Heritage Book Study - Review of *The Sea Around Us* by Madeleine K. Barnes



You may have read or heard of the author, Rachel Carson. She is best known for her book, *Silent Spring* (1962), about the use of the synthetic pesticide DDT and the environmental impact that it was having at that time. She was also a master of scientific research and had previously written a trilogy of books about the ocean. One of these is *The Sea Around Us*.

What is important to know is that Rachel Carson was a writer, scientist, and ecologist. She graduated college in 1929, went on to study at the Woods Hole Marine Biological Laboratory and received her MA in zoology. She had never seen the sea until she went to Woods Hole, Massachusetts at a time in history when women were not allowed to venture out on scientific forays aboard boats. She was hired by the U.S. Bureau of Fisheries to write radio scripts during the Depression. These were challenging times and she supplemented her income writing feature articles on natural history. She had a fifteen-year career in the federal service as a scientist and editor. She became Editor-in-Chief of all publications for the U. S. Fish and Wildlife Service. Ms. Carson had a passion for writing and a love for the sea that led her to write her "biography" of the ocean for the public to enjoy and understand.

You may be thinking that a book originally written in 1951 might not be relevant some 70 years later. I want to assure you that this best-selling book provides wonderful descriptions of how the seas first formed, their geologic composition, currents and tides, erosion, and the effects of temperature and salinity. Much of our scientific understanding remains unchanged with additional insights layered into it as they have been discovered. With the bones of science underneath it, Ms. Carson wrote this book to engage our sense of wonder and discovery about the vast liquid world that surrounds us. She wrote about the interconnectedness of the land and air, and forces of the sun and moon upon the sea, using her extensive scientific knowledge and writing talent to generate cinematic imagery in our minds.

"There is no drop of water in the ocean, not even in the deepest part of the abyss, that does not know and respond to the mysterious forces that create the tide." - Rachel Carson

Sometimes less is more and I hope that this brief description has intrigued your interest in adding this wonderful book to your summer reading. Take this one along with you to the beach as you gaze out into the sunlight, watching it dance on the surf. If you would like to know more about Rachel Carson and her books, please check out these links below:

<http://www.lindalear.com/events.htm>

Rachel Carson: Voice of Nature, PBS video - March 22, 2018, Viewing Time: 56:46

<https://www.rachelcarson.org/Default.aspx>

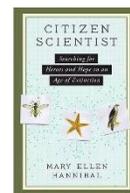


Our next Zoom AT meeting will be on Monday, June 7, to begin our discussion of *Bringing Nature Home: How You Can Sustain Wildlife with Native Plants* by Douglas W. Tallamy with the first half, pages 7-144. Due to the July 4<sup>th</sup> Holiday, we will meet on Monday, July 12 to discuss the second half of the book, pages 145-

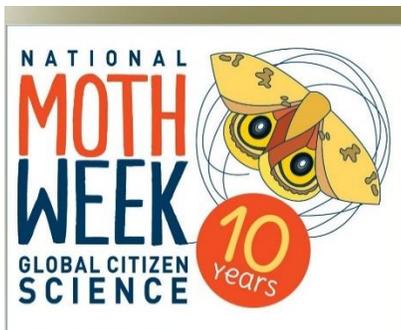
287. If you want to join us for either or both of these AT opportunities, please contact Madeleine Barnes at

[Mad2Btmn@aol.com](mailto:Mad2Btmn@aol.com) to be added to the list

for additional information and receive the Zoom meeting link and password. Our next reading selection will be *Citizen Scientist: Searching for Heroes and Hope in an Age of Extinction* by Mary Ellen Hannibal for August, September and October.



We welcome your participation each month for two hours on the first Monday of the month starting at 10am for these AT meetings. Please note that we welcome anyone to participate whether you are TMN certified, recertified, or just want to remain a chapter member. We look forward to seeing you and let us know if you have read any good naturalist books lately. Happy trails!



JULY  
17-25  
2021

## June and July Activities

### ADVANCED TRAINING OPPORTUNITIES

**Chapter Meeting** - June 3; Moths of Texas  
Presenter - Sam Kieschnick, TPWD  
6pm Social, 6:30pm Meeting, 7pm Speaker  
Via Zoom; 1 AT hour

**Water Pollution in Galveston Bay: Past, Present and Future**

Saturday, June 5. 10-11:30am via Zoom  
Presenter: Cindy Howard. 1.5 AT hours

**Why and How to Garden for Wildlife in Your Backyard**

Wednesday, June 23. 2-3:15pm via Zoom  
Presenter: Lauren Simpson. 1.25 AT hours

**Ducks Unlimited Wetland Conservation**

Wednesday, July 21. 2-3pm via Zoom  
Presenter: Taylor Abshier. 1 AT hour

### Ongoing

Heritage Book Study Group

First Monday of every month via Zoom  
10am-noon; 2 hours AT  
Contact: Madeleine Barnes 281-474-9406  
See Pg. 11 for meeting dates and books.

### STEWARDSHIP OPPORTUNITIES

For a complete list of stewardship activities, see our chapter website, <https://txmn.org/gbmn/what-we-do/>.

### EDUCATION - OUTREACH OPPORTUNITIES

For a complete list of education - outreach activities see our chapter website, <https://txmn.org/gbmn/what-we-do/>.

**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.

### CHAPTER INFORMATION AND RESOURCES

**Calendar** - <https://txmn.org/gbmn/events/month/> Includes meetings, AT and volunteer activities

**Board** - <https://txmn.org/gbmn/board-of-directors/>  
Contact information for the Board of Directors.

**Board Meetings** - usually first Tuesday of each month (via Zoom), verify on the calendar

**Committees** - <https://txmn.org/gbmn/board-of-directors/>  
Contact information for the Committee Chairs

**Volunteer Service** - <https://txmn.org/gbmn/volunteer-service/> Volunteer Opportunities

**Advanced Training** - <https://txmn.org/gbmn/advanced-training/>

**Midden Archives** - <https://txmn.org/gbmn/> Go to The Midden on the top menu.

**Facebook** - <https://www.facebook.com/gbactmn>

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**The Midden Deadline**  
for the next issue

June 28

