



The Future of Fireflies

by Larry Gfeller

Night time paints with a fickle brush. As a child growing up, I remember old familiar things which appeared foreign and threatening at night. An old stock tank and windmill by day; a spooky gallows at night. The pastoral red barn I played inside by day transformed itself into an imposing castle at night; a place you could not pay me to set foot inside. But the night sky was different—looking up, it was me, the observer, who was transformed! There above me as I gazed into the firmament was a crystal night with silent stars, a broken fingernail of moon and a few wisps of cloud—a child could only stare in wonder.

What are your memories of seeing the night sky as a child? As we grow older and learn more about the world around us, the miracle of the universe is eclipsed by our own self-centeredness, only to surprise us anew at a later time. Remember laying out on a blanket (or the bed of a pickup) on a summer evening gazing at the stars? Georgia O'Keefe, the famed artist, reportedly used her adobe rooftop in New Mexico to soak in the beauty of the nighttime spray of stars overhead. It's an eternal show that has inspired us for centuries!

Yet, as the world urbanizes, the practical need to light our cities has placed a cataract over our ability to appreciate the heavens. Miles upon miles of city lights combine to illuminate the night sky, bleaching out the stars overhead. Does it really matter that folks can't see the Milky Way with the naked eye anymore, or find the Big Dipper? The International Dark-Sky Association (IDA) thinks it does; they view the night sky as a natural resource, like forests and snow-covered mountain ranges. Dark skies must be conserved for future generations to enjoy.

The IDA has been recognized for 29 years as the leading authority on light pollution and is the largest nonprofit organization working to protect night skies and combat light pollution worldwide. When engineers, designers, planners, architects, astronomers, and dark sky enthusiasts from around the world come together in their passion for the conservation of natural night, it sparks connections that lead to real

change. It's a process of outreach and education. By use of stringent standards for measuring light pollution, the IDA recognizes communities that have taken steps to preserve dark night skies by declaring them an "international dark sky community." Such worldwide designations are a rarity and they are a mark of distinction which numerous cities and locations around the world strive to achieve.

Standards are tough and are based on The Bortle Scale, which rates how well you can see celestial

(Continued on page 2)



Light pollution over mountains

IN THIS ISSUE

The Future of Fireflies	1
What's Blooming?	3
Meet Carroll & Beth	4
Brooks on Books	6
Bill's Snippets	9

Fireflies, cont.

(Continued from page 1)

objects in a certain place, taking into account light pollution and sky glow. Lower numbers indicate darker skies. For example, Big Bend Ranch State Park has a Bortle Scale rating of 1, while Cedar Hill State Park, near Dallas, has a Bortle rating of 8. There is a lengthy IDA application process to document the sites' dark sky attributes and steps taken to comply with dark-sky best practices. Once the application is complete it must be favorably reviewed by the IDA's Dark Sky Places Committee and subsequently approved by the association's board of directors for locations to attain the coveted dark sky designation.

What does all this have to do with nature?

Research in this area is continuing but scientists have known for some time about circadian rhythm, that roughly 24-hour cycle in the physiological processes of living beings that affects brain wave activity, hormone production, cell regeneration and other biological activities. Anybody who's ever suffered jet lag or severe insomnia understands! Although most of these cues are internally generated, light can also play a role. Light pollution is mostly concerned with artificial lighting at night and it affects much more than humans.

Scientists in Switzerland have demonstrated that artificial light introduced to nighttime meadows reduced the number and frequency of active pollinators. Isolating one plant species—the cabbage thistle—ecologists found fewer insect visits to the lit meadows. They also noted fewer pollinators than in the control plots, which resulted in fewer fruits on the cabbage thistle plants they were studying. Because there was reduced fruit production in the study plots, it appears that pollinators that work during the day were unable to make up for the reduced number of pollinators at night.

In Maryland, scientists found similar disruptive effects of light pollution on the reproduction of fireflies. These little beetles (there are over 2,000 species found on every continent except Antarctica) light up to find mates and artificial light causes fewer flashes (there are other reasons fireflies flash, but mating is a major one). In Virginia, researchers even tethered females so they couldn't fly and free-flying males could easily find them. In the presence of artificial light courtship activities and mating success was reduced.



In separate unrelated studies of sea turtles, moths and certain seabirds, the presence of artificial light has been shown to alter or adversely impact natural processes critical to survival not only of the species concerned but, by extension, the larger food chain of which they are a part. Baby sea turtles had difficulty making their way to the sea by night, moth reproduction was stunted and predation increased in the presence of strong artificial light, and nocturnal seabirds, which are attracted, disoriented, and grounded by artificial lights nearby their colonies, had problems navigating.

So light pollution generates a range of ecological impacts, but from a conservation perspective, light-induced mass fatality events in nature are one of the most severe ecological consequences.

So what can we do about it?

Modern society tends to carry a sense of entitlement and takes most of the natural world for granted. At the general citizen level, all of us can help by using fewer exterior lights, installing lighting that is directed toward the ground and turning off lights that are not in use. It's just uncommon sense.

From a personal standpoint, as naturalists, we can participate in various rescue programs of national and state conservation organizations, citizen science research groups or concerned citizen groups in areas where

(Continued on page 8)

What's Blooming?

by Liz Pullman & Judy Turner

This article may well be titled, "Does ANYBODY know WHAT is this plant?" If you come along on one of the LPMN Biocensus hikes sometimes you will see a group of naturalist-looking types at a standstill, gathered around something green and leafy just off the muddy trail. All eyes are widened, lips tightened, shoulders shrugging, heads turning from side to side. We look at each other and all of us realize that none of us has a clue as to "What is this plant?"

So, a new MYSTERY plant. There is sudden activity as we realize we need to check out all characteristics and take photos. Quickly we decide on basics such as Dicot or Monocot, then start guessing as to Family using the exclusion method . . . not Aster Family, not Carrot Family, not Mustard Family . . . certainly not Morning Glory Family, etc. We will need to ID it the hard way using photos, flipping pages and comparing sketches and looking through handbooks and manuals. Fortunately, we have no deadline and we are able to revisit the plant if necessary.

This year, due to an intensive project requiring a biocensus twice each month, our mystery plants scarcely get identified before the next hike and yet another Mystery shows up. Since the identifications go into an official iNaturalist Project (McKinney Roughs) our database keeps expanding and even better, we are finding plants never before found at the Roughs.

Early this season was the first deep research for a puzzle. Here was a small plant past bloom with the pedicels (flower/seedpod stalk) of the seedpods in the shape of a gooseneck. No flowers. Past bloom. Our Flora of North Central Texas became dog-eared from all the page flipping. Finally, we threw in the towel and consulted our plant guru, Bill Carr.

Next was another past bloom plant - the seeds were also on pedicels but were sort of dangling like ornaments all up and down the flower stem. Distinctive. This turned out to be one of those frequently overlooked species with non-showy flowers and a rather uncommon plant.

Next was a small tree in a front yard on a private land biocensus. Evergreen compound leaves, fruit/follicles (the dry or fleshy fruit derived from a single carpel or ovule-bearing unit of a flower that opens along a single suture or seam) on a terminal branch. It was misidentified at first and Bill Carr again saved the day. The plant was abnormal in that one of the best clues to the ID was simply not there.

On the last three hikes, we have routinely visited the overflow parking area to check out a little plant with "fiddle" leaves. At first, it really seemed exotic, a couple weeks later we were still at a loss to guess the ID. After we visited the third time it was looking like a half size version of an abundant plant that was common (and unlovable). Hopefully we can confirm this when it blooms.

Some mystery plants remain mysteries a long time. In 2014 Judy Turner presented her famous Green-striped Mystery Plant. Finally, by locating some in Louisiana, we were able to put a name on it and she now has its grandchildren growing happily in her yard.



(Continued on page 10)

Meet Carroll & Beth

by Larry Gfeller

One of Aesop's Fables—The Tortoise and the Hare—recounts a well-known race between unequal partners (in terms of quickness and speed) that most of us know from childhood. So here's a grown-up question: Do you think the tortoise and the hare could happily live together? Ladies and gentlemen, I give you Carroll Moore and Beth Freedman: husband and wife, committed partners and a unique paring of culturally diverse personalities.

Carroll speaks with a measured east Texas drawl, is quiet, analytical and experienced in the art of patience. Beth carries the fast-paced accent of a Long-Islander, does not hesitate to share an opinion and is a bonafide extrovert. I will leave it to you, dear reader, to select the allegorical match as to which personality best fits which character!

But differences aside, shared values drive this couple. Both are selfless activists in our chapter, both have served in demanding leadership positions and on our board of directors—suggesting that substance does transcend style. Other shared principles include: order and organization, maintaining close friends/family and unflinching application of the Golden Rule.

In 2014, Beth was selected by our board of directors to be the first honorary chapter member, based on her active support of LPMN and especially the Bridge Maniacs—Carroll is a card-carrying member. She took it upon herself to provide homemade cakes each month to recognize maniac birthdays. She was later asked to join the board of directors. Beth served two years as our chapter's Food and Fun Chair—a demanding position not unlike managing a catering business that supports all chapter gatherings. Also in 2014, Carroll was elected to a two-year term as chapter Treasurer—an exacting board position critical to our chapter's functioning. During his tenure he wrote badly needed financial policies and procedures that will serve the chapter for years to come. He has openly shared his birding expertise in numerous chapter advanced training events along the way.

Beth and Carroll make their home in Elgin, Texas. Beth continues to serve as a mentor to student naturalists while Carroll is a serving maniac, does committee work and contributes to special events. Both are well-read, well-traveled and keenly interested in current events. They frequently return to Beth's summer home on Cape Cod to escape the Texas heat.

But let's examine the distinctly different paths that brought them together.



Carroll Moore is the real deal—native Texan with roots that go back to the 1840s. Born in Kilgore, Texas, young Carroll spent most of his childhood in Lufkin and later in La Porte (near Galveston Bay). As a child, Carroll enjoyed his grandparents and spent a lot of time tagging along with his grandfather in the Kilgore countryside.

While his father held a position of respect within the community, Carroll's relationship with his dad was strained. His mother was a kind, gentle and enormously intelligent woman. Both parents were career educators, a course that Carroll would eventually follow.



(Continued on page 5)

Carroll & Beth, cont.

(Continued from page 4)

Carroll's relationship with his grandfather was special: He adored and idolized the man. "Papa" wasn't susceptible to pretense like some others were . . . what you saw is what you got. "He was a real modern day 'Gus' as Duval played in Lonesome Dove," Carroll says. His grandfather's quiet country wisdom and cautious, careful manner served as a role model, even above that of his own father.

Carroll learned from his grandfather about dependability, hard work and patience; he also learned that knowledge comes with responsibility. Papa served as a county elected official and Carroll admired him for it. To this day Carroll remains interested in our political processes. This special generational bond remained steadfast right up until the day of his grandfather's death.

As a young adult, Carroll gained a math and accounting degree in just 3 years and signed his first teaching contract at age 20. After finishing his masters in math, he was invited to teach at Angelina College in Lufkin—he stayed for 29 years! Carroll supervised the honors program for many years, specializing in calculus and statistics (he was in the business of producing serious engineers from home-spun country folks). Carroll's role as a mentor was one of the most satisfying experiences of his teaching career, maintaining relationships long after graduation.



In the intervening years Carroll married and had two sons: today one lives and works in Austin while the other lives on Carroll's 56-acre farm and works in Rusk, Texas. The farm has been in the family for 108 years. Carroll was married for 23 years, then single for another 20 years before meeting Beth (more on that later). Carroll retired from teaching at age 54, moved to Austin to work for the Texas Department of Human Services before attending graduate school in computer science.

Everyone within the chapter knows Carroll's passion for birding—he's made a lifetime commitment to the hobby. Having acquired his first guide book at age 8, he hasn't looked back since. It didn't hurt that he befriended a well-respected ornithologist with an international reputation (the first man in the world to personally view 4,000 birds). Together, Carroll and his friend traveled to places like India, Cuba, the Canary Islands, Thailand and other countries. Carroll has birded Australia 4 times and New Zealand twice. Altogether he has visited some 30 countries and covered most of the United States pursuing birds.



Meanwhile, half-a-world away in New York, another very different personality was being shaped. Elizabeth Freedman's childhood was spent with two older brothers on Long Island. It was an idyllic existence from a more innocent time—no drugs, no violence, no gangs—by 8 years old Beth could take the train into the city of New York and freely navigate the subway without a care.

Although she came from a tight-knit, loving family, her mother's alcoholism eventually became a dominant family challenge. Primarily through her father's love and her aunt's insightful support, Beth was able to remain grounded and focus on the positive aspects of life. Beth remembers, "I was always happy, knew I was loved by my family and watched a lot of very old and extremely pure and clean, happy ending types of movies and TV shows in the 50's. I had adventures and trips with my family, played a lot in the woods and was a very earnest Girl Scout learning lots of badges—even camped out!"

Beth learned her A B C's in the Catholic school system from kindergarten through high school on Long Island. Later, she attended Catholic college in Minnesota but finished her degree in Business Administration at Eckerd College

(Continued on page 7)

Brooks on Books - Navigation

by Bill Brooks, with help from Nicholas Cowey

Today we navigate across town or around the world in a wholly different manner than just a few years ago. GPS has changed the way we guide ourselves from place to place, be it with a hand held GPS unit or GPS with Google Maps in our cars and phones.

To go “old school” we might pull the paper map from our car’s glove box. (Yes, kids. You can find out where you are with a paper map and a few cross roads.)

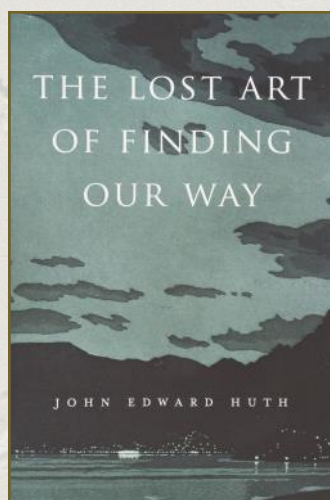
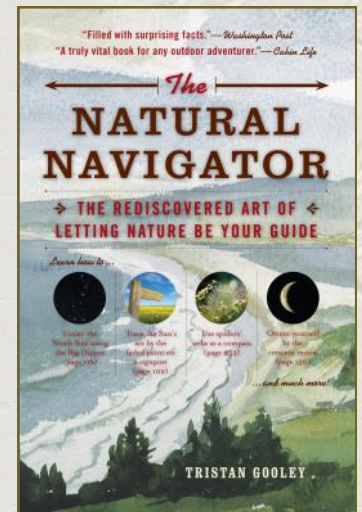
Even fewer of us may be able to take a compass and a good topo map and find our way in the wilderness. (Nicholas teaches a wonderful class at McKinney Roughs on map reading and finding your bearings with a compass.)

Even this type of navigation is not really “old school.” Humans have been finding their way across unknown lands for years using hints nature gives us. You can tell much by the passing of the sun and moon, the position of the stars, the growth pattern of trees, and the orientation of spider webs.

Once paths were developed, early Americans occasionally made “marker trees” to use, much as we use street signs today. Examples of potential marker trees can still be seen in McKinney Roughs LCRA Park and in Austin’s Wildflower Research Center.

To sharpen your wilderness navigation skills and to develop an understanding of what you can see in nature, I recommend the following four books.

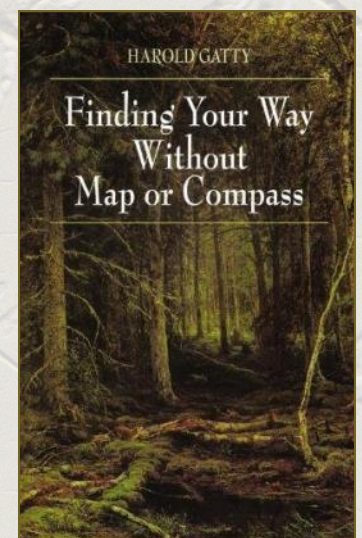
Two of the best are written by Tristan Gooley, a Fellow in the Royal Geographical Society. He learned his craft traveling all over the world and studying with indigenous cultures. His talents were honed as he flew, and then sailed, across the Atlantic Ocean. His first book (c. 2010) “*The Natural Navigator, The Rediscovered Art of Letting Nature Be Your Guide*” is my favorite. Four years later (c. 2014) he published “*The Lost Art of Reading Nature’s Signs*.” Both are full of hints on how to find your way around the forest, desert, and the oceans and how to find things essential to living.



“*The Lost Art of Finding Our Way*” by John Edward Huth is a newer book (c. 2015). John Huth is a professor at Harvard. This book is more of a history of navigation at sea and on land with a focus on Western Europe, the Norse, and the Pacific Islanders. This book is an excellent history of navigation but is slightly less useful as a “how-to” book like Tristan Gooley’s.

Lastly we have a classic, “*Finding Your Way Without Map or Compass*” (c.1958) by Harold Gatty. The copy you find of this book is most likely a Dover Publication, a publisher whose specialty is keeping classic texts in print. The original title of this book was “*How to Find Your Way on Land and Sea by Observing Nature*.”

Charles Lindbergh called Harold Gatty the “*Prince of Navigators*.” Gatty learned the stars while on night watch with the Australian merchant navy. Later he was the primary navigator when he and Wiley Post flew around the world in a record 8 days in 1931. (Gatty published a book about the flight, “*Around the World in Eight Days*,” with an introduction by Will Rogers.)



(Continued on page 7)

Carroll & Beth, cont.

(Continued from page 5)

in Florida. By age 20 Beth had married and soon became a mother. Even with a business degree and commitments at home, Beth's destiny was nursing. It wasn't just a craft, a trade or a career . . . it was a calling! Beth took the plunge while living in Ohio and completed her nursing education there.

"As a child," Beth says, "I loved taking care of anyone with a cold or fever, even poison ivy. I even rigged IV lines to my dolls and placed Band-Aids on the trees in my backyard when I thought they were leaking/bleeding sap!" As Beth worked in the field, she continued to earn new certifications and licenses. She spent over 40 years in the healthcare business and served in positions ranging from nurses' aide to RN to Health Care Executive, all while still keeping her RN license active.



Life contains great moments and not-so-great moments. Among the best moments for Beth were motherhood, skydiving, climbing the Great Wall of China, praying at the Vatican and white water rafting in Alaska. Among the challenges were seeing her only son wounded in Afghanistan, divorce and the death of her spouse. These experiences define who we are, our features softened by time like soapstone. What we are left with today is a happy, infectious woman who reads voraciously, gives back to her community, enjoys baking and cooking, adores her family and loves to travel.

So, how did these two meet?

After being widowed in Florida, Beth took employment at Seton Medical Center in Austin to be near her son and eight grandchildren. Beth & Carroll met online through a senior dating site. Even though Carroll stayed in east Texas for two years while supervising his aging mother's health, he won Beth's heart through "countless long evening phone calls." As the relationship blossomed, meetings were arranged and they eventually became engaged. After his mother died, Carroll left his home of 40 years and came to Austin. The couple married at the Driskill Hotel in October 2011.

Occasionally the stars and planets align to create extraordinary outcomes. It is incredible enough that these two souls found each other. That they discovered Lost Pines Master Naturalists together and that they made equally dramatic contributions to our organization with such different personalities is a marvel. A wise man once said, all things excellent are as different as they are rare.



Brooks, cont.

(Continued from page 6)

Harold Gatty's book is still a wonderful guide on how to use your senses and the heavens to find your direction. It also gives hints on navigation in environments like the deserts and the Polar Regions. There is a very interesting chapter on the important skill of estimating distances and dead reckoning.

Harold is also author of the book *"The Raft Book: Lore of the Sea and Sky"* for World War II soldiers on how to survive at sea in the Southern Pacific and what you should do if you need to abandon ship (c. 1943).

Read on and enjoy . . . and try not to get lost.



Fireflies, cont.

(Continued from page 2)

these problems are understood. We can also work with Texas state parks to assist with lighting audits and help promote and participate in public star gazing events.



But at the community level, solutions begin with awareness. Supporting the IDA (there is a Texas chapter) and other research groups promotes working with industry and local government councils to better manage their lighting. Actions such as replacing outdoor lights with more efficient low-light fixtures and retrofitting others to keep light from emanating upward not only enhance the nighttime sky but also save energy on the ground. At the community level it's an educational/persuasion process.

As naturalists, some of the best places to appreciate the celestial beauty of our heavens are in our state parks. Happily, Texas Parks and Wildlife

Department has embraced the dark skies concept and is striving to get many state parks qualified as "international dark sky parks." In recent years, TPWD started recognizing the impact of urban sprawl and resulting light pollution on many of its 95 state parks and is developing policies and lighting management plans to address the issue. Texas State Parks leadership is partnering with the McDonald Observatory and the Texas chapter of the IDA to audit the night skies above the parks and implement their recommendations.

Copper Breaks State Park (panhandle) and Enchanted Rock State Natural Area (hill country) were the first to be designated and they have been joined by Big Bend National & State Parks and South Llano River State Park since. Others will follow. Although not part of TPWD, the Texas City of Dripping Springs is also classified as an international dark sky community.

"Texas is rapidly becoming a national leader in the dark sky movement," says John Barentine, manager of IDA's Dark Sky Places Program. "There are some really dedicated folks in Texas' parks and communities taking significant steps to protect the night skies and educate policymakers and the public about the importance of preserving one of the state's most precious natural resources."

As LPMNs, these are activities which support our mission and put our best skills to task. IDA is currently seeking sponsors for its 29th Annual General Meeting and Conference in Boston this November. Learn more about the organization at www.darksky.org.



Whether you enjoy the upside down quality of the night sky from the bed of a pickup or simply enjoy the marvel of fireflies on a warm summer's eve, a dark night sky is worthy of conservation. It's a treasure not in money but in beauty. Although the show may be eternal, our ability to see and enjoy it is slowly fading away.

Bill's Snippets

A TEXAS FATHER

Robert T. Hill, the Father of Texas Geology (1858-1941) worked for the Smithsonian Institution, was the chair of the geology department at the University of Texas, and led a six-man expedition down the Rio Grande. He also named the Balconies Escarpment.

THAT'S A LOT OF JELLY

The Lion's Mane Jellyfish (*Cyanea capillata*) can have a diameter up to 6 feet 7 inches with tentacles that can be 121 feet long, longer than a blue whale.

The lion's mane jellyfish appears in the Sherlock Holmes short story "The Adventure of the Lion's Mane" published in The Case-Book of Sherlock Holmes. Holmes discovers at the end of the story that the true killer of a school professor who died shortly after going swimming (shouting "the lion's mane" before he succumbed) was actually this jellyfish.

Although the lion's mane is big and long, it's not the longest animal in the world. That record goes to the bootlace worm. One bootlace was found to be 180 feet long (although it may have been stretched).



WHY WE NEED A SWATTER

While a fly might only be flying at five miles per hour, 'time perception depends on how rapidly an animal's nervous system processes sensory information.' That perception is measured in hertz, and a fly's measures at 250 hertz to our 60. So while we might be swinging as fast as we can, they are observing us in a way that makes us look much slower, and therefore easier to escape.



FINDING AN ANCIENT FIRE PIT

Archeologists are now using Magnetometers to find ancient fire pits. Temperatures over 600 degrees permanently magnetize the iron in soil.

NOT A WELCOME ZEBRA

Since the zebra mussels were first discovered in Texas in 2009 they have been found in 11 lakes and 3 river basins. The newest discovery is in Lake Austin on August 17.



THE ORIGIN OF SNIPPETS

I get my snippets from my reading, the computer, and things I've heard and seen on TV. These all came from a Saturday morning educational TV show, Exploration Weird But True.

- Some butterflies never poop.
- The Cecropia moth has no mouth.
- The praying Mantis is the only insect that can look over its shoulder.
- Lady Bugs excrete juice from their knees when scared.

(Continued on page 10)

Blooming, cont.

(Continued from page 3)

The five Mysteries:

Scarlet Pimpernel (*Lysimachia (Anagallis) arvense*) - Easy ID when blooming, but even more of a mystery since it has moved from the traditional family to the Anagallis family. Lysimachia is named for King Lysimachus of Macedonia. Anagallis means delighting. Arvense means of cultivated ground.

San Saba Pinweed (*Lechea san-sabeana*) - Lechea is named for Johan Leche, an 18th century Swedish botanist. San-Sabeana refers to San Saba. This species is endemic to East Central Texas and may be named for the San Saba River, which separates Llano and Burnet counties. The first record of this species that I found on the University of Texas Herbarium was from 1924 in Bastrop County!

Hercules Club (*Zanthoxylum clava-herculis*) - This specimen was completely thornless! Zanthoxylum translates to yellow-wood and clava-herculis means club of Hercules. Good common name, huh!

Camphorweed (*Heterotheca subaxillaris*) - Surely we were not duped by Camphorweed!

Heterotheca is combination of two Greek words meaning the other of two and case. Subaxillaris means "below the axil."

Wand Blackroot (*Pterocaulon virgatum*) - Ptercaulon is from the Greek for wing stem. Virgatum means wand-like. Finally, a plant that looks just like it is named. Well, that is, if you dig it up to see the wand-like black roots. But, that's not happening to my babies!



Snippets, cont.

(Continued from page 9)

LADY BUG, LADY BUG..

According to the legend, European crops during the Middle Ages were plagued by pests. Farmers began praying to the Blessed Lady, the Virgin Mary. Soon, the farmers started seeing beneficial ladybugs in their fields, and the crops were miraculously saved from the pests. The farmers began calling the red and black beetles lady beetles. In Germany, these insects go by the name Marienkafer, which means Mary beetles. The 7-spotted lady beetle is believed to be the first named for the Virgin Mary; the red color represents her cloak, and the black spots represent her sorrows.



Chapter Contacts

President, Marcia Karr
marcia.karr@gmail.com

Vice-President, Paula Weisskopf
pjweisskopf@gmail.com

Secretary, Allen Guisinger
aguisin@aol.com

Treasurer, Marsha Elrod
melrod1@earthlink.net

Past President, Julia Akin
jefakin17@gmail.com

Food & Fun, Sandi Ward
sandi.sward@gmail.com

Basic Training, Michal Hubbard
michal_firecap@yahoo.com

Public Relations, Larry Gfeller
larrydgfeller@yahoo.com

Advanced Training & Volunteer Coordinator, Vicky Gaconnet
vgaconnet@gmail.com

Education & Resources, Kathryn Hedges
kathryn_hedges@hotmail.com

Junior Master Naturalist, Kathryn Hedges
Kathryn_hedges@hotmail.com.com

Membership, Kaye Reeser
Kmarie.reeser@gmail.com

Chapter History, Cat May
cat.greenheron@gmail.com

Environmental Stewardship, Audrey Ambrose
kc1jc2@flash.net

Newsletter Deadline

Submission deadline for the next issue is October 20, 2017. We welcome relevant contributions, photos, announcements, or other material relating to the mission of the Texas Master Naturalist program, particularly those pertaining to our local area. Submissions may be edited for clarity, grammar, spelling, and space requirements. Please send information to the editor at Roxanne.M.Hernandez@gmail.com.

STATE PROGRAM CONTACTS

Website: <http://txmn.org>

State Coordinator: Michelle Haggerty, 979-845-5777, mhaggerty@ag.tamu.edu

The Texas Master Naturalist program is sponsored by the Texas AgriLife Extension Service and the Texas Parks and Wildlife Department.

SPONSOR CONTACTS

Caldwell County Extension Office: Michael Haynes, 512-398-3122, caldwell-tx@tamu.edu

Bastrop County Extension Office: Rachel Bauer, 512-581-7186, bastrop-tx@tamu.edu

Bastrop/Caldwell County TPWD Wildlife Biologist: Robert Trudeau, 512-332-7280, Robert.Trudeau@tpwd.texas.gov

