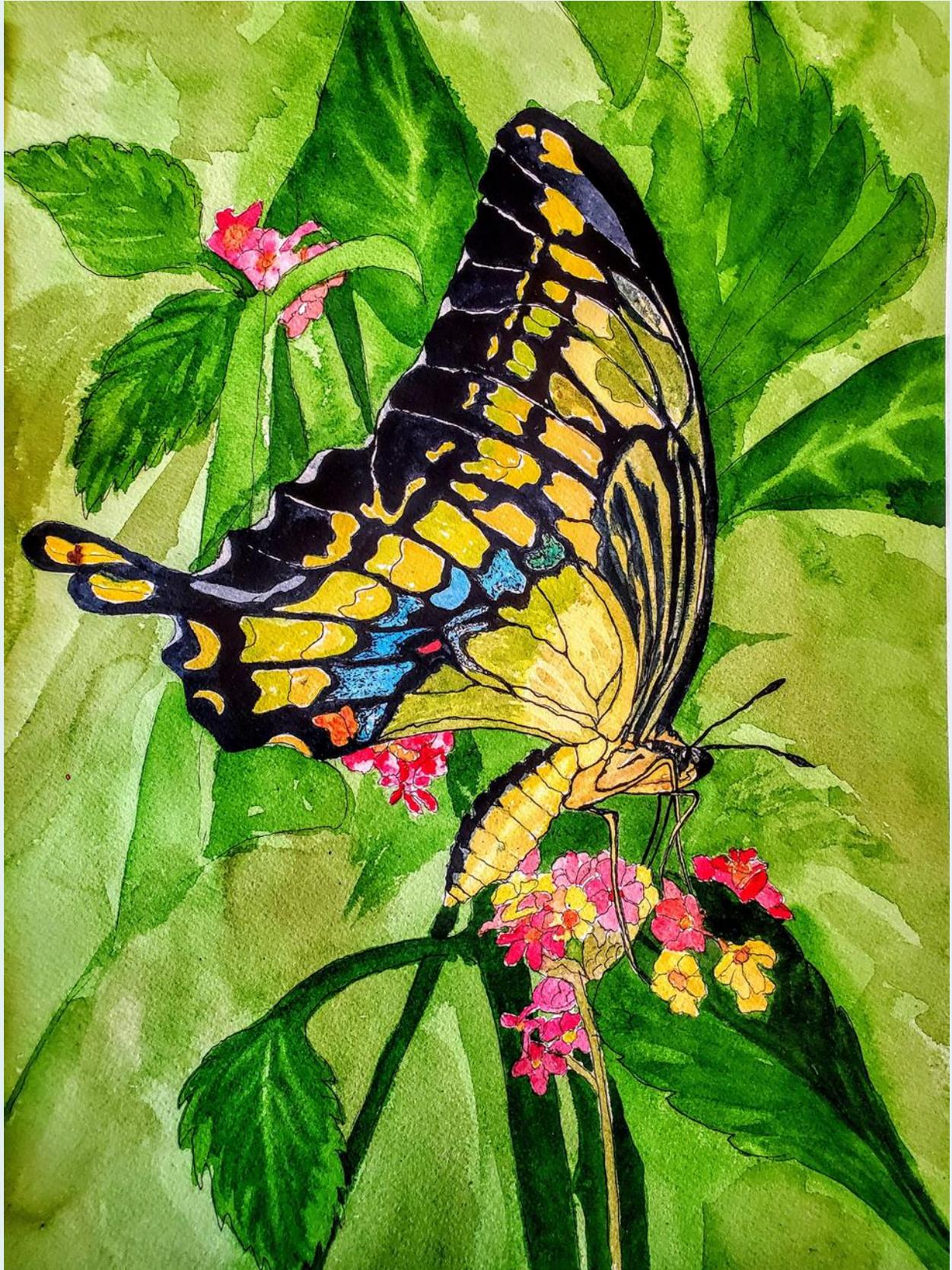


The Steward

Fall/Winter 2020

Highland Lakes Master Naturalists

Volume 11 Issue 3



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Please submit pictures, articles, reports, stories, announcements, etc. to becky_breazeale@yahoo.com

Photos should have captions and appropriate credits. We will announce the deadline for submissions two weeks prior to the deadline. Or contact Becky and Martelle.

Thank y'all for ALL!!

Message from our President

By Stephen Harrell

The more time I spend in HLMN and the TMN organizations, the more remarkable the people appear. Over the last 12 months my expectations were exceeded. During a very challenging time, we managed to perform our mission of stewardship, service/coaching/teaching, and continuous education in new and unexpected ways. By the end of 2020 I was amazed by the opportunities available to us to safely work within the restrictive environment.

In spite of Covid19, TMN's found ways to certify across the state and in our chapter. We learned new 'normal' ways to contribute and manage our activities in the last 12 months. The changes were difficult and frustrating for everyone – unfamiliar technology and ways of working created problems and restrictions, but we have new capabilities that will serve us in future.

Last year, many members strode through all the issues and obstacles seemingly without losing a step. Others took a misstep or two, even tripped occasionally, but regained their balance quickly and moved forward. Some were mesmerized by the changes and took more time to adapt, but eventually met the challenges and overcame them. I feel I'm somewhere between the last two categories.

Since joining HLMN and especially in the last year, I slowly learned there are many dedicated members that spend great time and effort making what I do as a Master Naturalist possible and valuable. Some are widely known while others are in the background as advocates and knowledge experts, many are both. Administering the organization, providing information to members on a casual and formal basis, finding, organizing, and leading efforts and activities, and spending a great deal of personal time to make activities successful. Many of the same people perform these tasks and others periodically step up as needed. All I had to do was show up at the correct time. We are all very appreciative of their effort.

This year holds great hope for a return to normalcy by the end of the year and perhaps earlier. Meanwhile, I urge all of you to continue involvement in forms of TMN activities that suit your interests by joining virtual Volunteer Service and Advanced Training opportunities or by those avenues that allow physical meetings within the TMN guidelines.

Here I Am Lamenting Again

By Phil Wyde

Here I am lamenting again. It is January 8th and we have had so many freezes that there is not a single flower in sight. There are very few leaves on the trees, and the ones that are left have no color. Butterflies and other insects appear to be extinct, and with the restrictions resulting from the COVID19 Pandemic, there is very limited access to parks and many other interesting attractions. **WHAT IS A WOULD BE NATURE PHOTOGRAPHER TO DO!** (Billy, this is a lament.)



Figure 1. Orange Capped Warbler at Wyde Feeder, Taken 01012021

Undaunted, each day I pick up one of my cameras and set out to see what I can shoot. I have to be careful since there is a lot of other shooting (hunting) taking place around my house and out in the surrounding countryside. However, with what I think is a lot of patience and thought I am trying to overcome the limited number of subjects to photograph. I would like to share with you some of the things that I have doing – and then let you see some of the images that I have been getting. This way you can decide on how successful, or unsuccessful, I have been doing.

One of the first things that I did was to set up a bird-blind. However, remember it is January and we have had freeze after freeze in the mornings when the light is so nice. Thus, I set up my blind in our kitchen where one of the windows looks right out at our bird feeders. I put a bar stool in front of this window which fortuitously is right next to a counter with our coffee pot, microwave and a small under the counter refrigerators. Thus, I have been able to sit patiently and wait for birds to show up while I read a book on my tablet and drink from a coffee cup kept on the counter. While Joan has accepted this, she often give me looks – maybe because I when at my blind I am blocking the bread box, the little refrigerator, the little microwave and the coffee pot. Also, I think that the cold air coming in through the open window bothers her.



Figure 2: White Winged Dove Taken at Wyde Feeder 01022021

all year round. I almost never take a direct route, or major road, anywhere. I take the extra precaution of frequently asking Joan if she wants to just take a ride with me. Of course, I really do want to spend more time with her. The good thing is that this way I can fulfill two desires at once. Regardless, it is amazing what

Regardless, my blind works well and I am getting some decent, close images, such as those shown in Figures 1 and 2. Note that I really don't favor taking images of birds on feeders. I prefer more natural settings. However, these are tough times. To try for more "natural" shots, I frequent the blinds at Granite Shoals Park and the Inks Dam National Fish Hatchery. The images shown if Figures 3 and 4 were both taken at Inks Dam National Fish Hatchery.

Another thing that I do to get interesting shots is to take every back road in this area that I can. Indeed, this is something that I do



Fig.3: Red Shoulder Hawk Taken At IDNFH 01042021

you can see wandering around our back road. Figures 5 – 7 provide some examples.

Figure 5 shows a Texas Longhorn. Now I have taken images of a lot of longhorns and I am sure that you have seen a lot of them. But you have to admit that this one is a beauty and somewhat unique. Can you imagine a predator looking at him and trying to figure out if he was seeing straight. And even if he finally figured out that he was looking at steak on the



Figure 4: Yellow Rumped Warbler Taken at IDNFH 01082021



Figure 5: Texas Long Horn Taken On Back Road Between Granite Shoals and Marble Falls

hoof, can you picture the predator thinking of taking on those horns?



Figure 6. Momma and Baby Burro Taken On Back Road Near Bume Seton Hospital 01072021

In Figure 6 you can see that I captured the image of a mother and baby burro. The baby was the cutest burro that I have seen. If there wasn't barbed wire between us I would have tried to hug it (and be kicked to death by the mother).

You might wonder what is special about the image in Figure 7. It is more special than you think. The reason is that image visualizes my personal motto, "Bloom Where You Are Planted." Yes, I know that the Prickly Pear in the image is not blooming. But think about what it took for a Prickly Pear seed to get into the tree, find enough substrate to start to grow and then



Figure 7. Bloom Where You Are Planted Taken IDNFH 01052021

to tenaciously stay up there. And I am sure that it blooms up there! So now you know. I try to bloom (do my best) wherever, or whatever, I am doing.

Another strategy that I have been using to keep my shutter finger flexible and ready is to consider taking pictures of things that I might ordinarily pass on shooting when there are “tons” of flowers, insects, birds and other colorful things to shoot. Images 8 – 10 provide examples.

I walked passed the tall tree whose image is shown in Figure 8 many, many times. (It grows at the bottom portion of our land.) It looks nice when it is all leafed out in the spring and summer. However, I have not found it particularly “photo-worthy.” However, a few days ago on the 2nd of January when I looked at the tree, I found it very appealing. (Nothing else nearby was.) For you that are photographers, I often shoot with a Polaroid filter covering my camera's lens. If you shoot at the right angle, the Polaroid filter makes the sky appear “very” blue, as seen in this image.

I hope that you look at Figure 9 before you read this paragraph. Doesn't something seem very strange about the shot? Well, the image is a shot of the reflection of an ordinary, bare tree in a pool of water. I am kind of fascinated by it, but would have passed on taking the shot in less austere times. Interestingly, if you look at the image of this same tree taken directly and not as a reflection of it, you would think that I was crazy to have taken the shot.



Figure 8. A Tall Tree At Bottom of Oak Bend Kingsland TX (PW & JW Property)

Now certainly you have to question why image 10 is in an Texas Master Naturalist article! Are there really any flying horses around? Now or ever? Well I think that I can say with some certainty that there are no flying horses around now. And I am dubious that there were ever any in prehistorical times. However, there certainly were flying horses in legendary times, and the statue provides an example of how nature colored the thoughts of early humans and still influences modern art and culture.

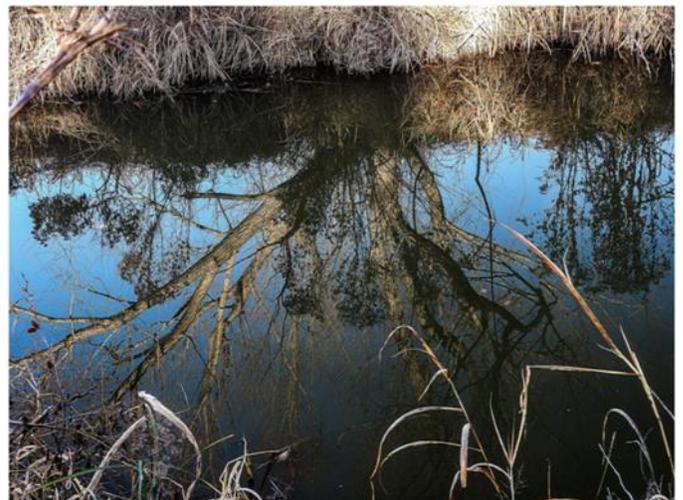


Figure 9. Reflection of Bare Tree at Oak Bend (PW & JW Property) 01022021



Figure 10. Pegasus Statue Taken On A Back Road Between Junction & Mason 01052021

I will end this discussion with an image that came close to being almost great! I was focusing on a stalking Great Blue Heron and finally decided to push down on the shutter button. The heron struck just then. I really did not register that had until I looked at the image that I took. Of course the image is not great since it could be a lot sharper. Moreover, it would be nice to have a follow-up shot of a fish or a frog in the heron's mouth. Alas, I do not have that follow-up image. **BUT IT IS NOT MY FAULT!** He did not catch what he was after.



Figure 11. Did He Get The Fish? Taken On A Back Road In Kingsland 0104202

I feel remorse about not getting the perfect Heron Action Shot. I ask myself if Martelle, Stennis or Mark (Strake) would have gotten it. Well, I don't let my remorse get me down. Instead I plan on trying again, and again, and again until someday I do get the perfect shot (not necessarily of a heron). Thus, I will continue to take one of my cameras with me everywhere that I go no matter what the season or weather. Which reminds me. It may snow this Sunday, January 10th. I am soooo excited.



**And snow
it did...**



Fig. 32° Snowcased paddle cactus on CR 114. Photo by Martelle Luedecke

Riverside Nature Center

150 Francisco Lemos Street
Kerrville, TX
By Louise Suhey



In late September of 2020, my daughter and me decided to visit Kerrville, TX and it's surroundings. One of our favorite stops was to R.N.C. on the Guadalupe River at Town Creek, less than an hour NW of San Antonio. It's quite easy to find and just around the corner from Mammacitas Restaurant where you can have a wonderful Mexican meal.

Usually, their Butterfly Garden is covered in blooms, especially in the spring with lots of native plants. Unfortunately this year, with our record breaking hot and dry summer/fall, nothing was



blooming but the Texas Sage. However, as we were heading to our car, we noticed their parking lot had a fantastic cactus and succulent garden, with nice benches where you can sit in the shade. All these plants were obviously loving the heat. There were wonderful examples of Opuntia, Agave, and very large Golden Barrel Cacti. One was covered in fruits with a few beautiful blossoms left. If you are



looking for great xeric design examples, check it out. Their gift shop is wonderful with lots of information about local birds and their distinctive songs. Master Gardeners are responsible for taking care of the gardens. Don't forget to look for the Heritage Garden dedicated to Carroll Abbott, "Mr. TX Wildflower", who helped get the TX. legislature to designate the 4th Saturday of April to be TX. Wildflower Day in 1981.

R.N.C. is well worth a visit any time of year. For more information call 830-257-4837 or go to their web

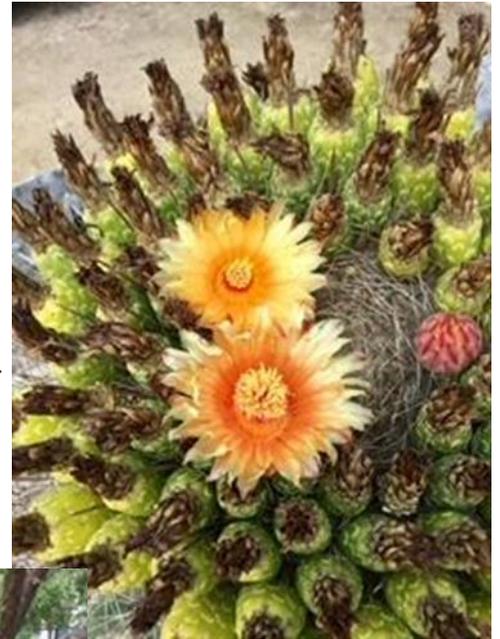
site at www.riversidenaturecenter.org.





If you have time to spare, check out Stonehenge II in Ingram, which is very close by. Also, high on a hill overlooking Kerrville is the Empty Cross, a 77' 70 ton, steel cross that is a tribute to all Christianity. It is fabulous, and be sure to take a large Sharpie to leave a prayer on rocks that are free of charge.

It's a once in a life time experience!



Zebra Mussels infest Lake Buchanan

By Lori Greco

Well, IT HAPPENED...Lake Buchanan is now infested with Zebra Mussels (ZM). An invasive species new to our area but not totally new to Texas lakes overall. I have SO VERY MUCH information on ZM that I think it is best that I keep it simple and straight forward. New information and science from Texas Parks and Wildlife Department (TPWD) and The Lower Colorado River Authority (LCRA) continues to expand as their next steps into research, prevention, eradication, minimize, or just begin to live with this very costly invasive species plays out. So, let us get started with some basics:

WHAT: Zebra Mussel, *Dreissena Polymorpha*, Pallas, belongs to the class of bivalve mollusks which evolved around the Triassic period(230 million years ago) and was first described by Russian zoologist Pallas in 1771. They are native to freshwater areas in Russia and Ukraine (Eastern Europe and Western Asia). They are about one inch long, triangular, and sit flat on their ventral side. Zebra mussels are armed with root-like threads of

protein, called "byssal threads," that allow them to firmly attach to any substrate such as rocks, our native mussels, or any other hard surface. Their life span is 5 years.

WHEN: ZM were carried to North America through the emptying of ballast water onboard transatlantic commercial vessels bound from Europe to the Great Lakes sometime around 1986. The mussel was first discovered in the Great Lakes in Lake St. Clair in June 1988. Since then, they have steadily been carried through North America by canals, rivers, and waters adjacent to each other. The first Texas infestation was found in Lake Texoma in 2009.



HOW: ZM spread in many ways. Their microscopic larvae, called Veligers, spread within bodies of water in the form of plankton. They also spread by live wells, bait buckets, bilge water, dive gear, waterfowl, and anything else that moves from one body of water to another. Females reproduce at one year of age, or younger if the water is warmer. They can release up to one million eggs per year. Adult ZM are carried on boats, trailers, anchors, and anything that sits in the water for a period. ZM can live out of water for up to five days in dry conditions and 21 days in wet areas such pipes or even a live well inside a boat that may be traveling from one lake or river to another.



WHERE: Lower Colorado River Authority (LCRA) scientists discovered ZM larvae in plankton samples taken from three sites around Lake Buchanan in October 2020 and TPWD confirmed the identity through microscopic and genetic analysis. The LCRA analyzed samples collected in November 2020 and found ZM at two of the three sites. In December, crews working on a floodgate project at Buchanan Dam discovered several settled ZM colonies.

WHO: Monica McGarrity, TPWD Senior Scientist for Aquatic Invasive Species Management, said, "At this time, the results indicate that the population in Lake Buchanan appears to be small. However, as we have seen in other Texas lakes, the population is likely to increase rapidly over the next few years."

Cory Evans, the Inks Lake State Park Superintendent also added, "We have two samplers here at the park and they are both located near the Park Store (one off the new boat ramp dock and one off the courtesy dock directly behind the Store). We are currently using settlement samplers (suspended brick substrate in the water column to monitor for juvenile and adult mussels)". Currently, park staff/volunteers are not performing any plankton sampling or water sample collection for DNA. There is a HLMN volunteer that monitors the settlement samplers monthly



Sampler locations at Inks Lake State Park near the Park Store

WHY the concern? ZM create harmful environments by attaching themselves to all other native bivalves and due to their quick colonization, they suffocate and starve them out. ZM filter one quart of water daily and being a voracious feeder, they eat a substantial amount of algae and zooplankton. This creates a high accumulation of pseudo feces-which makes for smelly water and little to no nutrition for native species.

They will grow so densely that they block pipelines and clog water intakes of municipal water supplies and hydroelectric companies. One year ago, Canyon Lake Water Service Company had to request over 8 thousand of their water customers reduce their water use by 50% due to the zebra mussels clogging their intake pipes. Austin Watershed Protection Department officials believe that it is likely the zebra mussels that created the Cyanobacteria (Blue-Green Algae) a poisonous plant that grows on the surface of warm water and killed several dogs that ingested the water at Lady Bird Lake in 2019. This continues to be a challenge for residents.



Boat owners must make sure to inspect their boat, trailer, and other recreational equipment that have been in contact with water, remove all mud, plants, or animals, drain all bilge water, live wells, bait buckets, and all other water from their boats, engines, and equipment. They must wash all parts of their boats, paddles and other equipment that have been in contact with water and dry their boats and trailers in the sun for at least five days before launching into another body of water. This is important because adult zebra mussels can close their shells and may survive out of water for several days. When washing their boats, boat owners should be sure to wash with warm, soapy water. If these precautions are followed, the spread of the species could slow down, and more lakes can be saved from contamination. It is too late now for Lake Buchanan.

Mitigation Facts

ZM have no natural predators here in North America that can keep up with their colonization but a few of our native species do find them tasty; diving ducks, crayfish, smallmouth bass, and freshwater drum all enjoy the mussels, but none have made any measurable impact on their numbers.

Final Thoughts

Zebra Mussels disrupt the ecosystem by creating a monotypic colonization and currently there is no stopping them. They damage harbors, dams and waterways, ships and boats, beaches, water treatment and power plants. This will be a very time consuming and costly endeavor for many years, and we may just learn to live with them. Oh, and this next summer if you plan to go swimming in Lake Buchanan, wear water shoes or risk getting your bare feet cut by the adult ZM that will probably start monopolizing the substrate beneath the surface of our lake. And for those of you that enjoy eating bivalves, it is strongly advised not to eat ZM as they accumulate pollutants and contaminants like giardia and E. coli.

TPWD officials are encouraging boaters and homeowners on Lake Buchanan and Inks Lake to keep an eye out for zebra mussels or suspected invasive species and report sightings to aquaticinvasives@tpwd.texas.gov with a photo if possible



Next
UP ...

Update on Horseshoe Bay Pollinator Garden

By Vicki Adcock

The Church at Horseshoe Bay Pollinator Garden is now in it's third year. Perennials have grown from 4" pots into thriving blooming plants that are attracting humming-birds, butterflies, honey bees, bumble bees and various pollinators. Next Spring should bring new wildflowers that were added from seeds in newly established rock lined beds.

The pollinators are enjoying Fall in the Memorial Garden! A small group of Highland Lakes Master Gardeners and Master Naturalists have been busy adding fall season

flowers. There are many new rock-lined beds, thanks primarily to the work of Highland Lakes Master Gardener/Master Naturalist Intern, Louise Suhey. She logs a number of hours working in the garden every week. We're also adding bulbs and seeds from our harvest that we'll hopefully see pop up in the Spring. Book clubs, men's groups, local neighbors with their children and others are enjoying this beautiful space.



WHAT WE HAVE LEARNED FROM 7+ YEARS OF RAINWATER HARVESTING

By Melanie Huff
January 2021

My husband and I bought our Hill Country home in early November 1998. The home came with acreage and two water wells, drilled into the Hickory aquifer.

While I don't know the chemical composition of our well water, the water "eats" metal. Since 1998, we have had to replace two dishwashers, as well as kitchen and bathroom faucet fixtures (we are on the third set of each). The well water also tastes terrible. We purchased bottled water for our coffee until 2004 when my husband installed an R.O. unit in the kitchen. Other than these tribulations, our well water was not an issue for bathing, laundry, or tooth brushing.

In 2009, I joined the Master Naturalist training class and learned about rainwater harvesting for the first time. The class on rainwater harvesting was held at Joan Mukherjee's ranch. I began to do further research on rainwater harvesting, including reading *The Texas Manual on Rainwater Harvesting*, which can be found here: [Innovative Water Technologies - Rainwater Harvesting Documents | Texas Water Development Board](#).

In 2012, my husband and I decided to try rainwater harvesting on a small scale by hiring a contractor to install a small system (two 2,500-gallon tanks) to service our guesthouse. Because the poly-mart tanks were taller than the guesthouse, we pulled the rainwater from the adjacent second garage roof by gravity into the tanks and located the pump and the disinfection equipment in the garage. The system was completed in March 2012. Because of nice rains in March and April, the tanks were filled.

We were thrilled with the rainwater. It did not corrode faucet fixtures, it tasted better, and my husband was able to use it in his wine-making endeavors. Based on our experience with the small system, we decided to bite the bullet and invest in a 30,000-gallon rainwater harvesting system to service our main house.

Construction started in March 2014. It involved installing gutters with screens, digging ditches to lay the gathering lines, installing 8 downspouts and connecting them to the gathering lines, constructing a pad for the tank, and assembling the tank. I don't remember the exact completion date, but there were heavy rains at the end of May 2014 that filled up the 30,000-gallon tank. The rainwater catchment area consists of the main house roof as well as the attached two-car garage roof. The main house roof is quite large because it includes four dormers as well as the roofing over the wrap-around porch. The water flows by gravity down to the tank situated in our pasture. The disinfection equipment is located in the attached garage, and the pump is in a small pump house adjacent to the tank.

In 2015, we had the guesthouse and the stable garage guttered to allow for the collection of rainwater from these roofs into four 1,000-gallon poly-mart tanks. The only piping involved are the rather short lines that go from the gutters directly into the top of the tanks. We constructed the pads ourselves to support the tanks, rather than have the contractor do it. This rainwater is used for irrigation only.

So here, in order of importance in my mind, are my takeaways from our rainwater harvesting experience:

1. *Rainfall is very uneven in the Hill Country, both from month to month and from year to year.* I have been a member of the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) since July 2010. All of the reports I have made (2,633 & counting) can be retrieved online. I have compiled a **Rainfall** chart from these reports at the end of this article that shows the monthly and annual rainfall for the period January 2014 through December 2020. The unevenness of the rainfall suggests that rainwater should not be your only water source for domestic use. It also suggests that the size and number of your rainwater tanks should take the uneven rainfall into account; the number of people in the house may not be a very important consideration to tank size and number.

2. *The need for a backup water source for household use.* In the summer of 2018, the water level in our 30,000-gallon tank got unacceptably low. This was caused by a small amount of rain early in the year and a small rainfall the previous year, meaning little carry forward. Therefore, we converted back to using well water until heavy rains occurred in the fall. The lesson we learned was that even for two people, a 30,000-gallon tank may not be sufficient in all years. You need to plan for backup sources of potable water. (We had our already existing wells.) Alternatively, you could put in much more tankage. I should note that putting in two 30,00-gallon rainwater tanks would have been cost prohibitive for us.

3. *The potential need for additional tankage to capture overflow rainfall.* In theory, according to *The Texas Manual on Rainwater Harvesting* (page 29), 0.62 gallons per square foot of collection surface (roof) per inch of rainfall can be collected. (In practice, some rainwater is lost to the "first flush system" as well as to "splash-out" from the gutters in hard rains.) In my experience, if we have a rain of three inches or more, the 30,000-gallon tank fills and the excess rain goes out through the overflow line into the pasture. If the tank is almost full, and we get a one-inch rain, rain also is released through the overflow line. Probably at least once a year, I have seen rain released through the overflow line of the 30,000-gallon tank. What is so annoying about such overflows is that the next month or the month after, there may be little or no rain. So, the best practice is to have more tankage for the purpose of preventing such overflows. If we had had an additional

10,000 gallons in tankage, we may not have needed to convert to well water in the summer of 2018.

4. *Does a rainwater harvesting system add to the value of a home.* The cost of a 30,000-gallon rainwater system is not insignificant. Before we signed the contract for the construction/installation of the system, I asked a real estate agent friend what such a system might add to the resale value of our house. She said “nothing.” A few years later, I asked another real estate agent (who is affiliated with the Burnet Central Appraisal District review board) what, if anything, such a system might add to the resale value of our house. She was far more optimistic, indicating that the necessity for water in Burnet County would make such a system a valuable asset.

5. *Maintenance of and repairs to a rainwater system.* Initially, it was hard to find locally filters for the disinfection equipment of the rainwater system. (They need to be changed about every three months.) However, during the last year, we have been able to order them through a local plumbing supply house and they arrive within a day or two. It remains difficult to find the ultraviolet lamp through which the water passes to be disinfected. It must be replaced annually. We order it online, and it is not unusual for the lamp to arrive broken. Our small rainwater harvesting system ceased to function about three years ago, following a day when the outside temperatures fell to 9° F. We are not certain if the freeze merely temporarily froze the pipes or if it damaged some of the equipment. In any event, we have been unable to find a contractor who is willing to come out and make the system operational again. (The contractor who installed the system is no longer in business.) The company that did our 30,000-gallon system remains in business, and has been happy to sell us replacement parts related to the tank. However, if major repairs are ever needed, it will be expensive to bring the company here from Austin.

As development continues in Burnet County, particularly in areas where drilling water wells may be prohibitively expensive or where there is no groundwater, rainwater harvesting may become the only feasible domestic water source. Careful attention needs to be given to the number and size of tanks, the property elevations, and the space that is needed for a rainwater harvesting system.



The 30,000-gallon tank after assembly but before all the piping was attached.

MONTH	2014	2015	2016	2017	2018	2019	2020
Jan.	0.05 in.	2.57 in.	0.21 in.	3.09 in.	0.07 in.	2.67 in.	2.03 in.
Feb.	0.17 in.	0.46 in.	1.04 in.	2.88 in.	2.58 in.	0.72 in.	2.35 in.
Mar.	0.13 in.	3.35 in.	4.01 in.	1.87 in.	1.20 in.	0.73 in.	3.74 in.
Apr.	0.42 in.	2.97 in.	4.88 in.	2.09 in.	0.30 in.	3.19 in.	3.84 in.
May *	6.17 in.	12.84 in.	5.59 in.	1.89 in.	4.53 in.	6.27 in.	4.12 in.
June	2.36 in.	2.19 in.	2.23 in.	1.17 in.	1.90 in.	3.21 in.	0.96 in.
Partial Year Total	9.30 in.	22.19 in.	15.73 in.	11.82 in.	10.58 in	16.79 in.	17.04 in.

* (30,000 gal tank installed and filled 2014)

Month	2014	2015	2016	2017	2018	2019	2020
Jul.	0.66 in.	0.04 in.	0.42 in.	1.86 in.	2.54 in.	2.51 in.	0.51 in.
Aug.	0.75 in.	1.31 in.	8.90 in.	5.42 in.	Combined with July	0.17 in.	1.09 in.
Sept.	2.63 in.	2.08 in.	3.37 in.	3.52 in.	12.07 in.	1.34 in.	4.36 in.
Oct.	1.35 in.	8.59 in.	0.21 in.	0.74 in.	10.71 in. Includes 9/27-30	1.37 in.	0.27 in.
Nov.	5.20 in.	4.73 in.	6.91 in.	0.46 in.	0.85 in.	0.92 in. Includes 10/27-31	0.58 in.
Dec.	0.55 in.	1.78 in.	1.91 in.	2.50 in.	5.55 in.	0.47 in. Includes 11/23-30	0.66 in.
Yearly Total	20.44 in.	42.91 in.	39.68 in.	27.49 in.	42.30 in.	23.57 in.	24.51 in.



The small rainwater harvesting system located behind the garage, which services the adjacent guesthouse located to the right.

COVID-19 Virus Safe Family Fishing at Inks Dam National Fish Hatchery

Photos by Phil Wyde and Celia Escamilla



Phil and I couldn't be more pleased with the support you provided for the COVID-19 Virus Safe Fishing Day, not only to make the event appear seamless to our participants, but for the joy you gave them.

We also appreciate very much the great set-up, the smiling support for our guests (your masks looked stretched horizontally ☺) and, for those who could stay, getting us reorganized and put away for next event. We know it takes longer but we get that paid back during set up next Fishing Day. George and Phil







Review of an WWF's independently published article: "Below the Canopy: Plotting Global Trends in Forest Wildlife Populations", written by Elizabeth Green, et al.

By Ray Buchanan, Master Naturalist

It sort of staggers the mind when you realize that significant conservation efforts are taking place all across the globe with millions of dollars, multi-thousands of administrators and volunteers, and thousands of "experts" involved. And it so happens that 2020 is a particularly critical year for evaluating progress in achieving previously set conservation goals and for determining future "Sustainable Development Goals."

Take for example that out of the 17 goals identified by the United Nations "Sustainable Development Goals," tackling growing poverty, empowering women and girls, and addressing the climate emergency make up the central focus of a mandated "Decade of Action" in its "2030 Agenda for Sustainable Development." Then, prompting this grim review of progress toward the climate change objectives set at its 2015 Paris Agreement: "never has the gap between a climate change and action been wider," the UN Framework Convention on Climate Change (established in 1994 with 197 countries as members) set 2020 as the beginning of a newly invigorated initiative concerning climate change. But the "world's largest and most diverse environmental network," the 1400 member International Union for Conservation of Nature (founded in the UK in 1948 and initiator for the World Wildlife Fund and producer of the annual Red List on Threatened Species), also set the year 2020 as the formative year for "the development of a global framework for the conservation of biodiversity." And in addition, the conservation organization, Conservation International, founded in 1983, now with 2,000 partners and offices in 29 countries, and headquarters in Arlington, Virginia, has developed its own "elements of a new biodiversity framework" under the generally assumed heading pursued by all these conservation organizations: "A New Deal for Nature and People" – a framework enumerating goals and actions dedicated to achieving the UN "Sustainable Development Goals" and the terms of the Paris Agreement.

But bringing all the global conservation organizations together for a discussion on the key elements of the new post-2020 global biodiversity framework, the "15th Session of the Conference of the Parties to the Convention on Biological Diversity," scheduled for Kunming, China, in October of 2020, was postponed because of the pandemic.

Nevertheless, such efforts to design and implement a new framework rely on cooperation from other specialized organizations such as on the research included in "Imagining the Post-2020 Global Biodiversity Framework," published by the International Institute for Sustainable Development, an independent think tank, which characterizes itself as: "We create the knowledge to act." Funding initiatives often come the World Wildlife Fund whose conservation efforts today include more than 3,000 projects "for the preservation of endangered spaces and species" in 100 countries. Along with the Zoological Society of London, the WWF also publishes basic research findings such as in the annual Living Planet Index, "a measure of the state of global biological diversity based on population trends of vertebrate species from around the world."

The WWF's own contribution to the post-2020 framework discussion is this "Below the Canopy"

article, based on funded research conducted from 1970 to 2014. Forests constitute a significant element in the “New Deal for Nature and People” because, according to WWF research and a recent study by the UN Food and Agriculture Organization: “Global Forest Resources Assessment 2020”, forests are the home of well over half the world’s land-based species and are one of the planet’s most important carbon sinks. In addition, forests provide eco-system services such as air and water purification, nutrient cycling, and soil erosion control. And it is estimated that around 300 million people live in forests, while 1.6 billion depend on forests for their livelihoods.

Recognizing that the alarming loss and degradation of forests can be attributed to clearance for community production, unsustainable logging, shifting agriculture, and wildfires, this WWF article advocates a new approach to evaluating and regenerating forests. Vital to the consideration of the new post-2020 framework in terms of forest health is the need to recognize that 268 species of birds, mammals, reptiles, and amphibians live in the forests and contribute directly to the sustainable forest ecosystem.

Pollination, seed dispersal, and herbivory contributions are major factors in forest regeneration. So, study of the wildlife populations of forests can identify significant trends in forest biodiversity.

And critical to such a study approach is the article’s assertion that the focus should be on the creation of a Forest Specialists Index, a study of population trends focused on those forest inhabitants who live their total life within the forest (as opposed to some time in the forest and some time outside). With that focus the WWF study of forest specialist wildlife over the years 1970 to 2014 showed that there had been a 53% decline in forest specialist populations, most dramatically among tropical species including mammals, amphibians, and reptiles but not birds. The article concludes that: “Overall, these findings tell us that many forest species are in serious trouble,” and that endangers the forests as well.

And the article asserts that research has revealed that forest cover change is not a determining factor in the wildlife species decline. Rather, along with habitat loss and degradation, the causes of decline that must be addressed are over exploitation, climate change, and the impact of invasive species. Only considering the traditional approaches involving forest size and numbers of trees is not enough as an answer to the issues involved in forest biodiversity.

As evidence of the efficacy of this newly devised approach to the study of forest health and to the mitigation of forest problems the article offers 5 Case Studies where a focus on the restoration of wildlife biodiversity brought positive results for the forests. In all 5 cases, the Java Rino in South Vietnam, the Colobus Monkey in Tanzania, agricultural encroachment in Costa Rica, the Mountain Gorilla in Central Africa, and threats to the Amazon Rain Forest from excessive dry/wet conditions caused by climate change, the creation of controlled areas and effective law enforcement to stop predation and human encroachment brought about forest recovery.

Conclusions: (1) the health of forests constitutes an essential part of the post-2020 framework for a “New Deal for Nature and People”; (2) the study of forest wildlife, particularly the “forest specialists,” provides a better measure of forest biodiversity than changes in tree cover; (3) forest conservation successes result from engaging the needs of forest wildlife “below the canopy”; (4) besides a more intensive use of monitoring technology, the greatest need is to bring about more collaboration between researchers, forest managers, citizens, and forest community members.

A few colorful birds to brighten the new year Watercolor

I do mostly watercolor. Here's a seagull I just finished and a couple of butterflies thrown in. The colors of butterflies and birds are an attractive painting for me. My butterfly collection is now up to 23. I am just starting a Green Jay that my daughter photographed in South Texas. What a beautiful bird that I have never seen before. ~ Gary Hampton





Ringtails

By Becky Breazeale

My husband and I were leaving our house in the middle of the night trying to get a head start on our vacation. As we approached the next street, our car lights illuminated a big tree. In the tree, two big black eyes were staring at us. As soon as it saw us, it ran rapidly down the tree head first. In an instant it was gone. Was it a cat or fox? Was it a raccoon?

I said it was a Ringtail *Bassariscus astutus* because I thought I saw a long tail. So, I did some research to back up my assumption. Ringtails, *Bassariscus astutus* (loosely translated as shy fox) are about the size of a cat with a raccoon tail. However the Ringtail's tail is flat and as long as its body. The tail is black and white with a black tip. When threatened, it bristles the hair on its tail. They have big ears which equips them to hear well. The large black eyes are surrounded by a white eye ring which helps reflect light into its eyes. They have five toes on each foot with sharp claws and can rotate their hind feet 180 degrees. This is why our Ringtail was able to climb down the tree head first.



Ringtail *Bassariscus astutus*. Photo courtesy of Texas Parks and Wildlife.

Courtesy of TPWD

Ringtails are mostly nocturnal and are easily spooked. Ringtails live in dens and usually prefer hollow trees, brush piles, rock caves and sometimes attics. Males seem to favor hollow trees and females like rock dens. Males and females do not den together. You can find Ringtails across Texas, but are less common in Coastal areas and the Rio Grande Valley. Predators of the Ringtails are coyotes, owls and humans. They are a very important fur bearing animal in the Edwards Plateau.



Courtesy of Nature.org

Female Ringtails are monstrous and their breeding period is between mid-March and April. The female emits a chirping sound to attract a male. The kits are born around mid-June and most litters are from two to four babies. The kits are weaned around August and starting looking for food with their parent and start their own den around September.



Baby Ringtail courtesy of pinterest.com

The kits eat meat around seven weeks and most adults eat a range of food. The largest part of their diet is small mammals, then fruits. They also have been known to eat birds, insects, invertebrates and cold blooded vertebrates.

So the next time you are taking a midnight stroll or get an early start to a long drive, keep your eye out for the elusive Ringtail. And if you aren't quick enough or lucky enough to see one, it might be worth your time to visiting a zoo to see one up close.

Good Reading

A review by Betsy Bouchard

Some of us are reading Doug Tallamy's latest book, *Nature' Best Hope, and we are enthusiastic*. The title suggests his point. We humans are, of course, both the cause of our environmental problems and the solution. Tallamy argues that it really comes down to "love thy neighbor" but he enlarges the neighborhood to include all the living things within its hedgerows.

Tallamy seldom scolds, nor is he gloomy. Instead, he lays out simply and clearly how an ecology works, how each element—the animals (that includes us), plants, insects, soil, microbial life—relies on other elements. In a balanced system, all thrive. Unbalanced, bad news for all.

We have heard this before, but not with the clarity or the optimism that infuses this book. Our ecological crisis is something we can get a handle on in our own yards. More than just a blueprint for planning our gardens, it is a blueprint for a revolution—one yard, one neighborhood, one town, one county at a time. A joyous revolution, I think.

Doug Tallamy is a professor in the Department of Entomology and Wildlife Ecology at the University of Delaware. His previous book is *Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens*

Suet Recipe

From Sue Kersey

- 1 cup Crunchy Peanut Butter
- 1 cup of lard
- 2 cups of Quick Cook Oats
- 2 cups corn meal
- 1 cup flour

Melt lard and peanut butter in a microwave or over low heat. Stir in remaining ingredients and pour into square freezer containers about ½" thick to fit your suet baskets. Store in the freezer until ready to use. This makes about 6 suet cakes. It is fun to make and birds need this supplement especially during the winter months. Sue Kersey



Friends of Inks Dam National Fish Hatchery/ Candlelight Ranch Sponsored Free Family COVID19 Virus-Safe Fishing Event for Military Families

Photos by Phil Wyde



COVID Safe Girl Catches First Fish

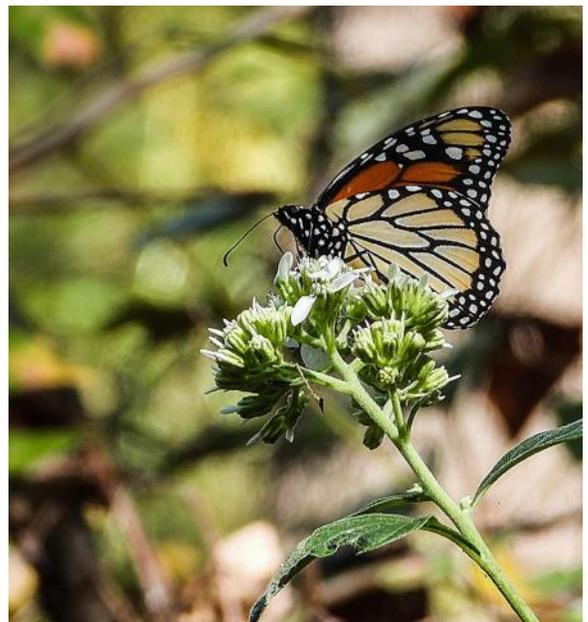


Happy Little Girl



Mamas First

Monarch Invasion at the Hatchery October 10, 2020



By Phil Wyde

The Monarchs were in masses (scores of them), but they were in dark shadows so that they don't have much color. But you can see they look like leaves. Of course, when they get to Mexico they are in the hundreds of thousands, or more. The single monarchs were in a spot of sunshine, so I got some of their color.

The owl is probably a Great Horned Owl, but I am not sure. They are usually fuller and there are other owls with long ears (e.g., the Long-eared Owl). But he was down by the Monarchs. I have sent the image to some serious birders to see if they are more certain than I am.



Fall Colors

By Pat Campbell



Maximilian sunflower



Plateau golden eye

Golden Northern Bumblebee on Pickerelweed



Gayfeather

Springtime should be spectacular at the new pollinator garden site—we tossed seed balls & wildflower mix — thanks Pat Campbell for foraging clay from her creek bed. Great day with lots of work clearing pear, planting new starts, raking, seeding & watering. Kudos to playing well with others—Suzanne, Hollis, Jerry, Diane, Kaye, Cris, Sherry, Cathy & Celia.

T E X A S

MISSION



The Texas Master Naturalist program is a natural resource-based volunteer training and development program sponsored statewide by Texas A&M AgriLife Extension and the Texas Parks and Wildlife Department.



The mission of the program is to develop a corps of well-informed volunteers who provide education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities for the state of Texas

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