Post Oak & Prairie Journal

A Regional Journal of the Cross Timbers and Prairies

Volume 2, No. 1 June, 2019

Citizen Science: What's Happening With Our Birds? (p. 6) Complete contents on page 3

POST OAK & PRAIRIE JOURNAL

A record of observations, description, and analysis of plant and animal communities in north Texas. The focus of the Journal is on the Cross Timbers, the Blackland Prairies, the Rolling Plains, and the Post Oak Savanna ecoregions.

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The Post Oak & Prairie Journal is published by the Editors and available as a pdf file without charge on Facebook at https://www.facebook.com/groups/PostOakPrairie/files/ and at https://issuu.com/postoak-prairie. It is not currently available as a print publication.

Submitting articles to the journal

We encourage you to contribute to the journal. Articles may contain natural history research and data pertaining to the region, as well as information pertaining to wildlife, plant communities, conservation, and land management within these areas. Occasionally we publish brief notes such as an observation of wildlife behavior or a species' occurrence that will be of interest to readers. Articles are peer-edited prior to acceptance, meaning that we ask other biologists and naturalists to offer their thoughts regarding clarity and content. The style we prefer for the journal is fairly informal. We want each issue to be engaging for anyone with a little natural history background, from amateur naturalists to biologists. Complete submission guidelines on the Facebook page or on request by email.

On the cover: A Great Blue Heron at the edge of a pond at Southwest Nature Preserve. Photo courtesy of Bob Brennan, https://bobbrennan.smugmug.com/

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Prairie Bishop and Indian Blanket in startling numbers cover this ever-changing spring meadow at Tandy Hills—see Page 14. (Photo by Don Young)

EDITORIAL:
The Role of This Journal in Our Community

Michael Smith

With this issue, the Post Oak & Prairie Journal returns to publication. Four years ago, the quarterly issues of Volume One contained natural history accounts of the Comanche Harvester Ant and the Timber Rattlesnake, explored trends in bird observations from Project Feeder Watch and described the reproductive potential of urban wild pigs at Fort Worth Nature Center & Refuge, and touched on numerous other topics. The journal was dormant for the next three years, but it is time to bring it back. There are so many natural history stories to be told and so much to explore and learn about the oak woodlands and prairies of north Texas, and there is a community of naturalists and biologists eager to share their observations about these places.

There are already several forums for sharing notes and photos. There are Facebook groups for Master Naturalist chapters as well as North Central Texas Wildlife and other organizations. There are newsletters from regional clubs, organizations, and societies. What can the Post Oak & Prairie Journal add that isn't already available? We think that the journal can have a unique niche among the Internet groups and organization newsletters, and we hope you will agree and join us as part of an active community of readers and contributors.

First, the journal can dig a little deeper than most Internet posts. Articles can give some background information, focus on a particular issue, and talk about what it means. When Jim Frisinger discusses trends in bird counts at Southwest Nature Preserve, he describes the habitats found at the preserve and links sighting results to weather, landscape changes around the preserve, and issues like climate change. When Rustin Stephens talks about the arrival of Emerald Ash Borer Beetles in Fort Worth, he lays out the history of this particular invasive species and the impact on forest ecology as ash trees fall victim to this insect. These discussions add depth and context that are rare in social media posts.

Second, issues of a journal like this one can remain archived for future reference. Social media posts are ephemeral; if we wanted to find a Facebook post about feral pigs we remember from a couple of years ago, it will be difficult to find, but Rob's article on the fecundity of these animals is still easily accessible in Volume 1, Number 2, April 2015. We will archive issues of the journal, and of course the pdf files are easily saved to one's hard drive.

Third, the Post Oak & Prairie Journal aims to bridge multiple groups of naturalists and biologists, offering itself to the naturalist community at large. It is not the newsletter or the Facebook page of a particular organization, nor does it focus on one particular kind of wildlife (birds, herps, mammals, etc.) or one particular kind of ecosystem. We are interested in the "big picture" of plant and animal communities in north Texas.

Additionally, articles in the journal can be cited in other publications. When you contribute to the Post Oak & Prairie Journal, you are contributing to the wider world of scientific publications. A journal is a more attractive venue for professionals and those in training to be professional biologists. Publishing in the journal is a valuable experience for students, who may have great things to contribute, and can get some support and guidance in the editorial process as they put their ideas and graphics together for publication.

As we worked to bring this issue together, I kept returning to the image at the end of Ray Bradbury's *Fahrenheit 451* of the community of people who preserved books by memorizing them and passing them down to others by reciting them. This kept coming back not because natural history works are being systematically destroyed, as were the

Editorial: The Role of This Journal in Our Community

books in Bradbury's dystopian novel. Instead, I returned to the idea of a dedicated community that finds creative ways to preserve something of great value. The knowledge of the landscapes around us, with all the species that live interactively within those landscapes, is of great value. As many biologists pursue very specialized, laboratory-based research, and the larger society focuses on those things that can be monetized, perhaps natural history seems like it is being left behind. Our community – of naturalists, biologists, land managers, and those who devote time to understanding nature – we will do our part to keep this knowledge alive as an important part of our culture. The journal strives to be a part of that community, and we invite you to participate with us as a reader and contributor.

Michael Smith is co-editor of the journal and a writer and naturalist from Arlington, Texas. He is a past president of the Dallas-Fort Worth Herpetological Society and active with Friends of Southwest Nature Preserve.

Small-mouthed Salamander (*Ambystoma texanum*) see at Old Sabine Bottoms Wildlife Management Area. Photo by Michael Smith

Citizen Science: What's Happening with Our Birds?

Twelve Annual Bird Counts at Southwest Nature Preserve in Arlington Offer Clues

Jim Frisinger

I'm a birding enthusiast who loves learning from masters of the craft. As the birding activities coordinator for Friends of Southwest Nature Preserve, people still look to me for answers despite my wobbly identification skills. What I can do is tap my growing stash of data—all collected by citizen scientists at the preserve for more than a dozen years. Southwest Nature Preserve is located at the southwest corner of Arlington, bordering the city of Kennedale.

In every year except one since 2007, volunteers have taken a population count at the preserve for the Great Backyard Bird Count. This joint project of Cornell University and National Audubon Society, now 22 years old, is held worldwide in mid-February. The 12 midwinter snapshots of the preserve hold a wealth of data.

Are there any trends? Friends of Southwest Nature Preserve nominated me to find out.

BIRTH OF A NATURE PRESERVE

The bird count at the 58-acre preserve site is actually older than the preserve itself. The property has long been a neighborhood landmark. It is dominated by four ponds, several meadows and the 100-foot rise of Kennedale Mountain. Habitats are varied in this remnant of the Eastern Cross Timbers, from wet to dry, open to forested, with several soil types. Upland post oak/blackjack oak cover the slopes of Kennedale Mountain. Glen Rose yucca sprawl across the largest meadow. A small riparian habitat drains the preserve into the Village Creek system. Cornell's ebird site reports 162 bird species have been counted at the preserve. On iNaturalist, more than 1,070 species of all kinds have been identified at the preserve. That's the most for any spot in Arlington. It's also a haven for dragonflies and damselflies. Three odonates have been documented here that are found nowhere else in Tarrant County.

For many of us, it's a magical place to visit.

The first Great Backyard Bird Count was held in 2007; the City of Arlington didn't formally open the nature park to the public until 2013. A number of Arlington folks, assisted by the Trust for Public Lands, the City of Arlington and by voters in a bond election, rescued the parcel from certain development. A parking lot, a fishing pier and a small segment of concrete trail were put in. Native Texas plants were brought back to the former ranch property. A network of trails is slowly being expanded to improve public access to the far corners of the preserve.

Various habitat types provide a wide range of food and cover for different birds year round. In February, it's home to both migratory and resident bird populations. Each checklist submitted helps researchers at the Cornell Lab of Ornithology and Audubon learn more about how birds are doing, and how to protect them and the environment we share.

Eastern Phoebe. Photo by Jim Frisinger

Citizen Science: What's Happening with Our Birds? (*continued*)

Yellow-rumped Warbler. Photo by Jim Frisinger

The 2019 count

Eleven citizen scientists gathered at 8 a.m. on Feb. 16, braving a windy, 32°F chill. Fanning out in groups across the preserve they then gathered two hours later to compile a joint checklist. The species count (26) was low but the bird population count was relatively high. Among the noteworthy observations:

◊ Three pine siskins were spotted – a first for the species in 12 bird counts although they are not uncommon in North Texas.

◊ Record numbers of seven species were recorded: mallards, redheads, double-crested cormorants, downy woodpeckers, Northern blue jays, tufted titmice and Northern cardinal. (More red-winged blackbirds were counted in the 2019 worldwide count; Northern shovelers and cedar waxwings were the most numerous at the preserve.)

◊ Three species, commonly seen in three-quarters of the earlier counts, were absent: pied-billed grebes, black vultures and ruby-crowned kinglets.

◊ Three species were spotted for the 12th-straight year: Northern cardinal, blue jay and yellow-rumped warbler. Four others appeared for the 11th time in 12 years: Northern shoveler, bufflehead, red-bellied woodpecker and Carolina chickadee. (Cardinals were the most commonly observed species in 2019's worldwide count.)

ANALYSIS

White-winged doves seem to be making more inroads at the preserve.

This is part of a relentless century-long range expansion in Texas. In his 1988 book, *The Birds of North Central Texas*, Warren M. Pulich reported that the white-winged dove was "not often reported in north central Texas. It seldom ranges beyond San Antonio and rarely to Austin and the upper Gulf Coast" (Pulich, 1988). He found sightings from only four north central Texas counties: Archer, Dallas, Navarro and Stephens. However, by 2005 Texas Parks and Wildlife reported the birds were breeding in most Texas counties. Author Robert C. Tweit (2007)) blamed riparian deforestation for agriculture after 1920 for chasing the birds from their original summer home in the Rio Grande Valley. The species have in part found homes in urban areas in the

White-winged Dove. Photo by Jim Frisinger

Citizen Science: What's Happening with Our Birds? (*continued*)

state, he said in his 2007 report.

Mourning doves, however, are increasingly missing during the Great Backyard Bird Count at the preserve. White-winged doves were seen five of the last six years; mourning doves only two of the last six years. This is exactly the reverse of the first six years of the count.

Total birds spotted have gradually increased at the preserve – but with significant variations year to year.

The 194 birds counted on Feb. 16, 2019, represent the third highest count in 12 years. Only 2017 (260) and 2014 (241) were higher. The low point was 2013 (75 birds). Figure 1 shows the trend line. With so many short-term factors at work, caution flags must be raised.

Our methodology (using citizen scientist counters) may have varied over the years—the first counts are lost to our collective memories. Variables include the skill set of the birders who show up, how many participate and where they roam for the two hours. In recent years we have broken up into teams to reach the far-flung habitat types, but the heart of the riparian zone is most difficult to penetrate and often observed from the edge only.

The number of different species counted has risen but barely; 2019 was a disappointment.

This may be the element most heavily impacted by the skills of the participants. One Master Birder may be able to identify birds by sound only, or at great distances. The 26 species recorded in 2019 was the second lowest, besting only 2013 (21 species). See Figure 2.

Weather greatly impacts the count.

As veteran birders have told me, low temperatures send birds into hiding, making them difficult to detect. Same, as well, for high winds, keeping birds under cover and out of sight.

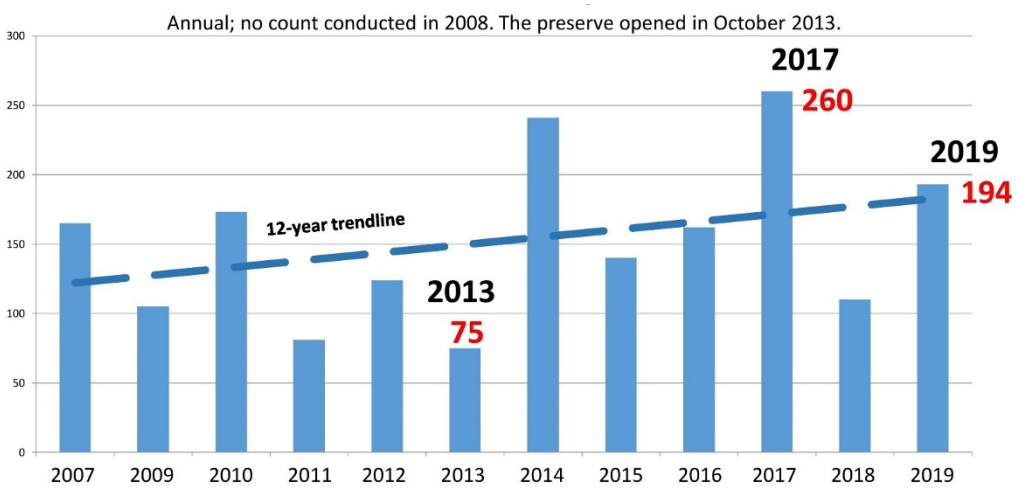


Figure 1. Total number of birds counted, 2007-2019

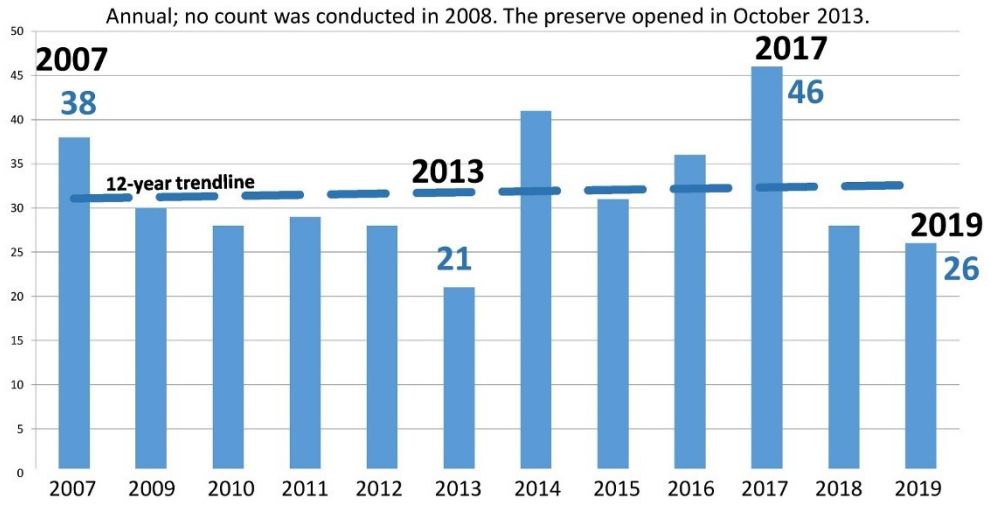


Figure 2. Total number of species counted, 2007-2019

Citizen Science: What's Happening with Our Birds? (*continued*)

Indeed, as Figure 3 shows, the weather appears to be the single most important factor in raising or depressing the count.

The 2010 bird count was the coldest at 32°F at 8 a.m. Only 28 species were counted – third lowest. The 2019 count was

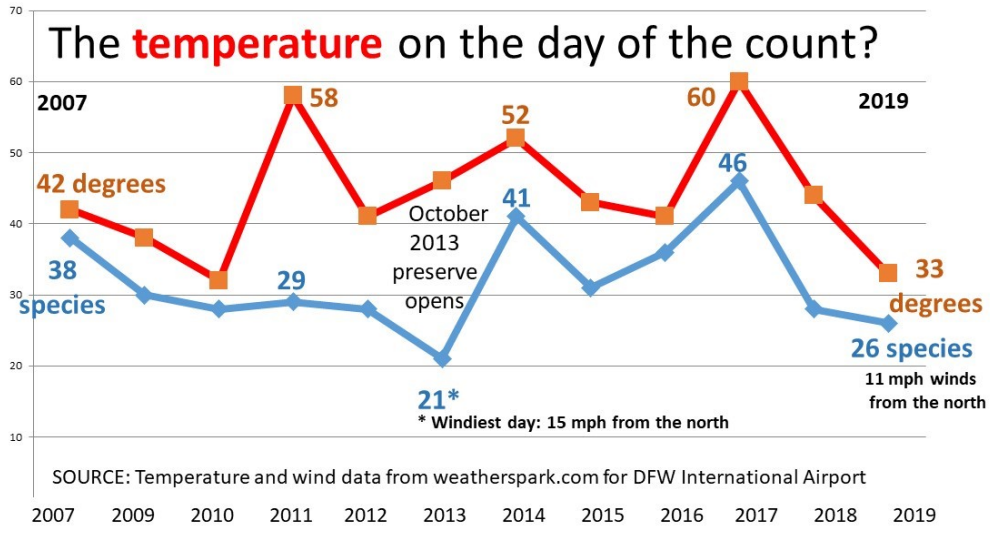


Figure 3. Short-term impacts on number of species counted

the second coldest at 33°F with 26 species counted, the second lowest tally.

The warmest count was in 2017, with a balmy winter temperature of 60°F. It was probably associated with the record for most birds (260) and most species (46). It was sunny, dry, and with winds out of the north at 9 mph.

The windiest day was in 2013 (15 mph), which also had the lowest species count (21) and lowest total bird count (75). The temperature, however, was a moderate 46°F. Ongoing construction to create the preserve may have also played a role that year; it officially opened to the public eight months later.

Dynamic change to the neighborhood continues.

The neighborhood geography has been very dynamic during the 12 years of the count. This has affected the bird count, but in unknown ways.

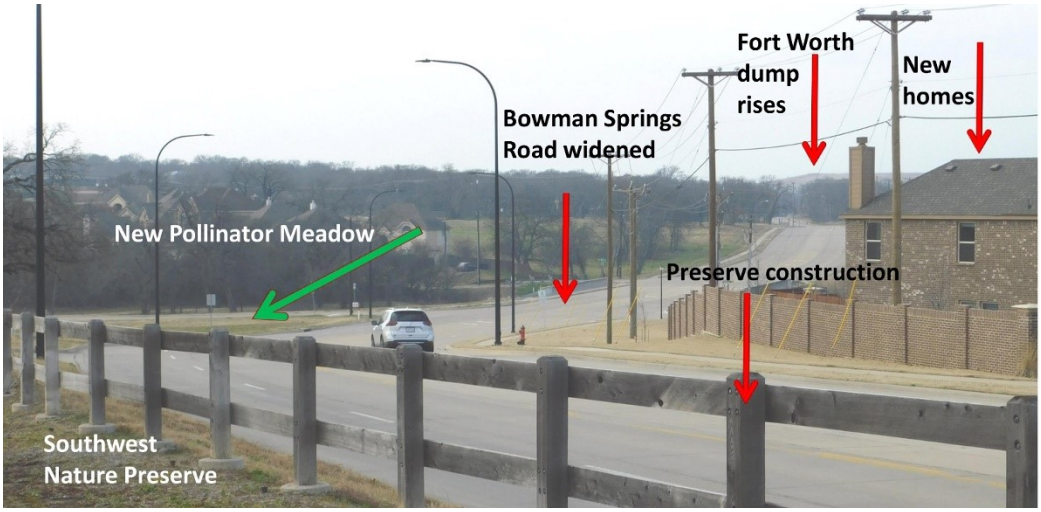
Construction of the nature park in 2012-2013 reworked the face of the acreage, which both damaged and enhanced the environment. Accumulated trash, a stone wall and a home were removed (including the home's slab). Anti-erosion barriers were constructed. A new paved parking lot and concrete path to the new fishing pier were destructive, but the native Texas landscaping on the edges of it were restorative. Some of the ecosystem restoration actions, which are ongoing, take years to mature.

Perhaps most dramatic were changes to Bowman Springs Road along the preserve's eastern border. It took a slender slice of preserve for the widening (from two lanes to five), but the road's new course correction resulted in two acres added to the preserve. This abandoned roadway is being restored as a Pollinator Meadow. Most recently a new subdivision was built on a pasture on the west side of Bowman Springs Road, which affected some bird sightings.

FUTURE TRENDS

Future bird counts will likely be buffeted by long-term trends in unknown ways. Climate change is one. The U.S. Department of Agriculture shifted hardiness zones northward and the most recent National Climate Change report, using data from the National Oceanic and Atmospheric Administration, predicted that the change will continue its northward march (U.S. Global Change Research Program, 2017). Two examples were seen in the 2019 worldwide count. It reported evidence that white-throated thrush and yellow grosbeak -- species native to Mexico and Central America -- are turning up in new areas. The yellow grosbeak was spotted in Uvalde County, Texas; the white-throated thrush was reported in Arizona, the first for the

Citizen Science: What's Happening with Our Birds? (*continued*)



Some countervailing impacts in a small space. Photo by Jim Frisinger

state and the first U.S. report for the species outside of Texas.

First sightings of Central American birds this year by the worldwide count represent the leading edge of population shifts to the north for these and other species – but that may not be a good thing, according to the Great Backyard Bird Count's 2019 summary. "Watching southern birds expand northward will be an ongoing theme in a time of climate change, although the other troubling part of the equation is that the overall populations of many of these birds are declining. So even as they move into new areas, this does not necessarily mean that these are healthy, thriving populations" (Cornell Lab of Ornithology, 2019).

Since the preserve is in the Central Flyway, impacts to migratory bird habitat in distant places will also affect what birds we see and when at the Southwest Nature Preserve. So, too, is the impact of changing bug populations – a major food source for many birds -- that has raised alarms from scientists who studied nature preserves in Puerto Rico and Germany (Washington Post, Oct. 15, 2018).

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Jim Frisinger is a retired former daily newspaper journalist in Dallas-Fort Worth who worked several years on ecosystem restoration for the U.S. Army Corps of Engineers in the Fort Worth District. He is an active iNaturalist citizen scientist.

Living With the Emerald Ash Borer

Rustin Stephens

This past winter, Texas A&M Forest Service confirmed suspicions that the emerald ash borer (EAB) had made its way to Fort Worth. Within the next few years, residents of Fort Worth will begin to understand the feeling and heartache shared by those in the Midwest and east coast who have lost their beloved ash trees. One can almost tell when the neighborhoods were built by the type of street and yard trees planted, and the Arizona, white and green ash certainly had their moment in the spotlight in Fort Worth. Their fast growth, attractive stature and adaptability made ash a great choice for home builders in the 70's and 80's looking for a shade tree with very few natural pests…then the emerald ash borer made an appearance in Michigan.

Identifying features of the emerald ash borer include its size, shape, and metallic green coloration. (Photo courtesy Texas A&M Agrilife Extension.)

It wasn't confirmed until 2002, but there was evidence of suspicious ash tree mortality in 1997 near Detroit, Michigan. The beetle was likely transported from its native forest type in China to the U.S. in packing material. While it is hard to estimate the total number of trees that have succumbed to the pest, most approximations are well over several million and growing. In the Midwest, where many municipalities had more than 15% ash for their canopy cover, many communities observed nearly 100% ash loss in less than fifteen years. One of the biggest hurdles for local government is whether to treat the susceptible trees or preemptively remove them. Trees that fall prey to the beetle are extremely brittle once dead, more so than other natural causes, and cannot be removed with conventional, cheaper methods. If you add in the cost of replanting, the treatment costs start looking a bit more appealing.

The loss of these trees is not only affecting city aesthetics and heat islands, but the forest ecology will also shift and adjust as the North American ash tree population decreases. There are over 2 dozen insects that are dependent upon these trees to complete their life cycle and an additional 150 insects are frequent users. With a reduction or elimination of hosts, these reliant insects will either find another suitable host or reduce in numbers along with the ash trees. It has been speculated, but how that decrease in beneficial insects will affect the food chain and pollination of forest plants will take decades to fully understand.

Thankfully, there are treatments against emerald ash borer that are extremely effective. The longest effective period is realized with a trunk injection of an intended chemical with the active ingredient of 4% emamectin benzoate every two years. It is recommended to start treatment when confirmed beetle activity is within 15 miles of your prized ash trees, and data from the Midwest tells us to be prepared to treat for 25 years. Even with the long term commitment to treatment, the price tag of removing and replacing the family's tree in the front yard would far exceed that, even before considering the loss of shade, storm water mitigation and wildlife benefits.

Just recently, ArborJet, one of the leading manufacturers of the equipment and chemicals to treat EAB, donated treatments to two designated Heritage Trees in Fort Worth: the regional champion green ash located at the Fort Worth Nature Center & Refuge, just a couple of miles from the con-

Living With the Emerald Ash Borer (*continued*)

ArborJet personnel inject the Regional Champion Green Ash at the Fort Worth Nature Center & Refuge, providing two years of protection from EAB. (Photo by C.J. Aitken)

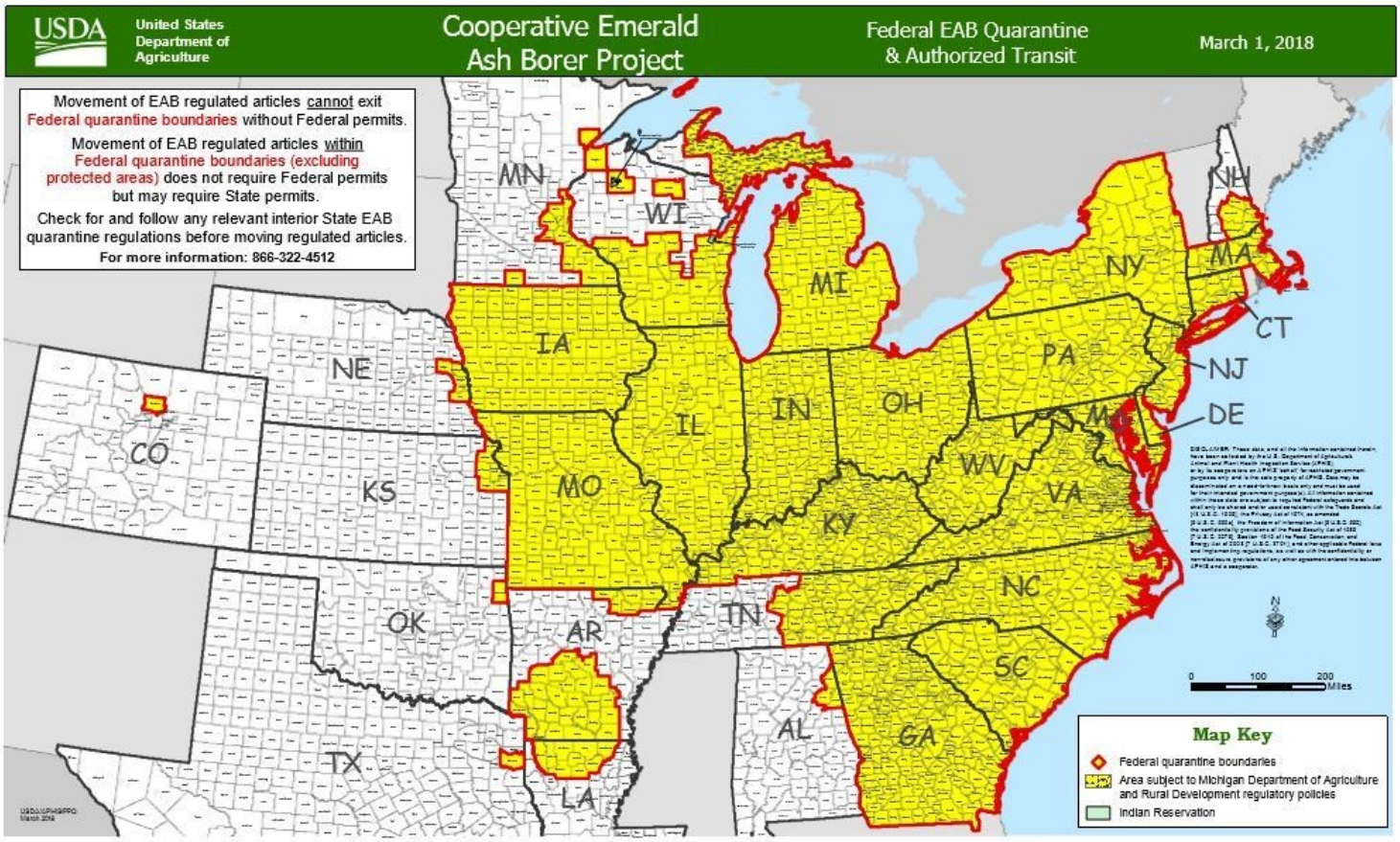
firmed infestation, and the regional champion Texas ash located at Pioneers Rest Cemetery. Through the company's program called Saving America's Iconic Trees, both trees received a trunk injection with a residual effect for two years. Since the recently confirmed presence in Fort Worth is so close to the biggest native ash population in the city, the opportunity to examine how the beetle responds to our climate will be invaluable to determining how forest managers adapt their management practices. When the adults start flying, and how long they fly, is always the key in trapping EAB to estimate the population. In warmer areas, it is likely adults will start moving earlier and for longer stretches. Since this is one of the southernmost areas confirmed with emerald ash borer, the chance to observe those changes will make this area a hotspot for research.

Emerald ash borer beetles on their own can spread a few miles each year, but their biggest gains are realized with human intervention, such as moving firewood and woody tree debris. The trend in its spread in the U.S. has been noticed primarily along interstate highways and spreading out from there. Several "pockets" have been identified where obvious trafficking was required to move the pest, such as Boulder, Colorado and now Fort Worth, Texas. The Texas Department of Agriculture has set a quarantine on Tarrant County, where the insect is confirmed, restricting the movement of ash nursery stock, all hardwood firewood, and other ash materials from leaving the quarantined area.

There have been some efforts to study the potential of replanting the ash trees with the Asian varieties that are not as susceptible as ours. While they can be tolerant of North American soils and climate, our pests that the native ash keep abated are expected to wreak havoc on the introduced varieties. But, successes with bringing over the emerald ash borer's natural enemies from Asia have been documented. These wasps have exhibited questionable reproductive success and uncertain winter hardiness, while only expected to limit the beetle's spread, not exterminate the invader. History has made environmental managers wary of introduced species in fear of trading one problem for another. It is easy to think about how kudzu or Asian carp were once intended to correct a problem, but have now become, perhaps, a bigger problem.

From a municipal standpoint, the battle with the borer can feel uphill, but we can still be good stewards of our forests by focusing on diversity and promoting the right trees in the right locations. As with most problems, early detection is the key. Significant dieback in the canopy, D shaped exit holes on the trunk with larval galleries under the bark, shoots of growth on the trunk as a stress response and increased woodpecker activity are all signs of EAB infesta-

Living With the Emerald Ash Borer (*continued*)



Every known emerald ash borer location is subject to quarantine. (USDA graphic)

tion. Several other factors could cause these effects as well, so an inspection by a trained arborist is necessary. With treatments, we can spread out or virtually eliminate the emerald ash borer tree removals and reduce the spread.

Rustin Stephens is the City Forester for Fort Worth and an ISA Certified Arborist. He has spent his professional career throughout Texas managing natural resources in commercial, private and municipal capacities

Tandy Hills Natural Area:

Land of Controversy / Wildflower Wonderland

Don Young

Tandy Hills Natural Area is a wildly bio-diverse slice of prairie heaven in the heart of a major metropolitan city, Fort Worth, Texas. To fully appreciate its charms and treasures, indeed its very existence, it helps to have a bit of historical overview.

The modern history of Tandy Hills began on April 22, 1960, when beatnik-loving Fort Worth Mayor, Tom McCann and City Council voted to purchase the land from a group of businessmen. (The land was originally acquired by the pioneering Tandy family in 1854.) Bounded by I-30 on the north and low-income neighborhoods elsewhere, the roughly 160-acres just east of downtown Fort Worth (including adjacent Stratford Park) is among the largest and most ecologically diverse urban native prairies anywhere.

The decision to purchase the land was not without controversy. The land was considered unsuitable for a park due to the hilly terrain. More than a year after the purchase, some council members still unhappy about the $173,000 price demanded an investigation saying the sellers may have colluded with Park Advisory Board members. Others pursued a plan to sell the land to land developers hoping to recoup some of the money.

The aptly named "Iconic Meadow" on the east end of View St. at Tandy Hills. (Photo by Don Young)

Tandy Hills Natural Area: Land of Controversy/Wildflower Wonderland (*continued*)

The central meadow along View St. in its Prairie Larkspur phase.(Photo by Don Young)

Eventually, the land purchase controversy died down but civic neglect into the late 70s made the land susceptible to trash dumping. In the 1980s dirt bikers and other off-road vehicle users discovered the prairie hills and caused extensive damage. Various neighborhood and environmental groups started making noise. In 1987, at the direction of the Fort Worth Park & Recreation Dept., L.Wayne Clark, of the Fort Worth Nature Center & Refuge, authored the Environmental Assessment of Tandy Hills Park (Clark, 1989). His paper was a sign of paradigm shift within the parks department.

The biggest threat to Tandy Hills occurred in 2004. The City of Fort Worth was about to become the nationwide ground zero for the urban fracking industry, thanks to the confluence of the controversial method of natural gas extraction and the Barnett Shale which lay under Fort Worth. Open spaces such as Tandy Hills were considered "low hanging fruit" by the industry.

However, an equal and opposite reaction occurred in 2004 when a few concerned neighbors founded Friends of Tandy Hills Natural Area. After learning about industry interest in the natural area, they mounted a public education campaign, including sending hundreds of letters to Mayor Mike Moncrief and industry officials and a few public protests. As it turned out, Tandy Hills became the birthplace of the anti-fracking movement that evolved into a global movement.

Dovetailing with Earth Day, the group inaugurated Prairie Fest in 2006 in an effort to raise public awareness of Tandy Hills in general and to help insure its preservation. The effort paid off. The city took notice and in 2008 created the Tandy Hills Master Plan (City of Fort Worth, 2008) and in 2010 entered into a support organization agreement with Friends of Tandy Hills. The April 2016 Tandy Hills BioBlitz was a resounding success, reinforcing to city officials the immense ecological value of Tandy Hills.

The one thing about Tandy Hills that inspires so much passion and controversy is wildflowers. The amazing diversity of wildflower species found here attracts scientists, citizen scientists, naturalists, photographers, hikers, poets, children and nature mystics by the droves.

In his 1989 assessment (see above), L. Wayne Clark noted:

> "Wildflowers are what really make Tandy Hills a special area. Although many areas have the climax grasses for our region, few have many wildflowers...Tandy Hills wildflowers are in the right place and the right amounts (almost all pioneer accounts mention the beauty and numbers of wildflowers)

Tandy Hills Natural Area: Land of Controversy/Wildflower Wonderland (*continued*)

> and it is from my observations the best place in Fort Worth for native wildflowers."

Every April, this amazing phenomenon is plainly visible to any springtime visitor. The three meadows along View Street, with their very shallow limestone soil, are arguably among the most eye-catching and bio-diverse in the region. The eastern-most meadow has been dubbed, "The Iconic Meadow" due to its size, floristic diversity and wide open view.

Purple Paintbrush, Engelmann Sage and White Winecup decorate this spring meadow. (Photo by Don Young)

On a typical day in April you can expect to see dozens of species blooming, all at once, in a tangle of arresting color. There are two showy species that dominate this spring carpet, the first being Purple Indian Paintbrush (*Castilleja purpurea*), which begins blooming in mid-March and usually peaks in late April. According to researchers from Northwestern University and Chicago Botanic Garden, who conducted studies of Purple Paintbrush in 2018 and 2019, Tandy Hills has the densest population they have observed in all the north Texas and Oklahoma prairies they have visited.

A few weeks later starting about mid-April, Engelmann's Sage (*Salvia engelmannii*) begins blooming, filling in most of the gaps between the Paintbrush. In his 2016 Tandy Hills BioBlitz Handbook, Dr. Bruce Benz notes that Tandy Hills' biological diversity inventory includes at least eight species that are endemic to Texas, one of which is Engelmann's Sage (Benz, 2016). Its blue-purple blooms are a pleasing contrast with the red-purple paintbrush. In some years, clouds of Greenthread (*Thelesperma filofolium*) and/or Engelmann's Daisy (*Engelmannia peristenia*) are equally dominant.

The paint-by-number spring prairie additionally includes less dominant but equally showy species including:

- Sensitive Briar (*Mimosa quadrivalvis*)
- Yellow Puff (*Neptunia lutea*)
- Winecup (*Callirhoe pedata*)
- Two-leaf Senna (*Senna roemeriana*)
- Blue-eyed Grass (*Sisyrinchium chilense*)

Tandy Hills Natural Area: Land of Controversy/Wildflower Wonderland (*continued*)

Prairie Bishop's Weed (*Bifora americana*)
Indian Blanket *Gaillardia pulchella*)
Drummond's Skullcap (*Scutellaria wrightii*)
Prairie Larkspur (*Delphinium carolinianum*)
Wild Hyacinth (*Camassia scilloides*)
Blue Flax (*Linum pratense*)
Yellow Flax (*Linum rigidum*)
Fringed Blue Star (*Amsonia ciliata*)

Lesser numbers of larger species like Antelopehorns Milkweed (*Asclepias asperula*), White Compassplant (*Silphium albiflorum*), False Foxglove (*Penstemon cobaea*). They make clear that the sobriquet "*iconic meadow*" is no exaggeration.

Wildflowers in these numbers attract a wide diversity of pollinators in massive numbers including more than 450 insect species. This naturally leads to robust bird diversity (Stevens, 2007). At least 119 species have been recorded on the Tandy Hills iNaturalist Project Page.

Tandy Hills Natural Area

3400 View Street
Fort Worth, TX 76103
Hours: Sunrise – Sunset
Free admission

Lone Star Legacy Park – 2017
Great Texas Wildlife Trail - 2016

Friends of Tandy Hills Natural Area
www.tandyhills.org

Like all urban natural areas, Tandy Hills is plagued by Privet (*Ligustrum spp.*) and other woody species. But, scattered between these woody areas are hidden meadows that when found, offer up characteristics unique to their location. Some have been named, such as Barbara's Button Hill. This exposed hillock with a nearby seep has, by far, the largest population of Barbara's Button (*Marshallia caespitosa*) wildflowers in the park, so many individuals that it's difficult for anything else to grow.

Another hidden gem is located in the central flats where an enormous patch of Wild Hyacinth takes over for a few weeks every spring. Scattered individuals are found elsewhere but this spot is the motherlode.

Similar micro-meadow systems exist for species including American Basketflower (*Centaurea americana*), Prairie Celestial (*Nemastylis geminiflora*), Texas Bluebell (*Eustoma grandiflorum*), and Purple Coneflower (*Echinacea purpurea*). In most cases, the number of individuals is so large that color variations are common.

Other seasons have their charms. Tandy Hills is blessed with thriving populations of iconic species such as Trout Lilies (*Erythronium albidum*) and Great Plains Ladies Tresses Orchids (*Spiranthes magnicamporum*). But it's the overwhelming magnificence of spring wildflowers that gets the most attention, and rightly so. Most of the controversies since 1960 have occurred because of a passion to preserve and protect this uncommonly rare urban prairie paradise. So far, so good.

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Don Young is President of Friends of Tandy Hills Natural Area and the author of the newsletter, Prairie Notes. He and wife, Debora Young, founded Friends of Tandy Hills Natural Area in 2004. They live across from the park and work together on their art glass business. Contact: info@tandyhills.org

The Ornate Box Turtle (*Terrapene ornata*) in North Texas:

A Look at iNaturalist Data

Michael Smith

Two subspecies of box turtles are found in north Texas, the Ornate Box Turtle (*Terrapene ornata ornata*, see discussion of names below) and the Three-toed Box Turtle (*Terrapene carolina triunguis*). Box turtles are part of the family Emydidae that includes the semiaquatic Red-eared Slider and the River Cooter. However, box turtles are terrestrial species and the Ornate Box Turtle tends to be found in upland, well-drained habitat such as grassland and savanna (Dodd, 2001). The subspecies previously called the "Ornate Box Turtle" now has the common name "Plains Box Turtle" (Crother, 2017), which is the name used in the balance of this article. That subspecies ranges eastward to Louisiana, Arkansas, and Indiana, northward to southern Wisconsin, and westward to Colorado. It is found throughout most of Texas to the Pecos River, where it becomes the Desert Box Turtle (*Terrapene ornata luteola*).

Plains (Ornate) Box Turtle, eating a grape (Photo by Michael Smith)

Because box turtles are widely believed to be threatened or declining, citizen science data submitted to the iNaturalist program (iNaturalist, 2019) might be useful in monitoring their populations. A public data collection effort by Texas Parks & Wildlife Department was transferred to iNaturalist as an easier, user-friendly way to receive observations of these turtles by the public. There will never be enough working biologists (or graduate students!) to monitor the populations of species like the Plains Box Turtle, but there are a great many citizen scientists with iNaturalist accounts who are happy to do their part.

One important caution when examining iNaturalist data is that observation effort cannot be held constant. That is, the number of people surveying one area is different from the number of people in another area. Citizen scientists have places they like to visit; they don't follow transects across the landscape in a standardized way and the species they are interested in may shift from box turtles to, say, wrens or treefrogs. This raises the possibility that a lack of reported turtles in one county might only mean that it is a place that herpetology enthusiasts don't visit much. Changes in the number of turtles reported might mean that an avid herpetologist moved out of the area, or that the economy got bad and everyone is working more hours instead of getting out and observing wildlife. Seasonal changes might reflect people's general unwillingness to go out in the heat of summer (along with the likelihood that turtles may be burrowed in, escaping the heat). You get the idea: scientific data are easier to interpret if the observations are done in a consistent, standardized way that allows us to rule out artifacts (a result that would not have happened naturally but only occurs because of the way the observations were made) and bias (conclusions that are misleading because our expectations or methods influenced the way we measured something).

The Ornate Box Turtle (*Terrapene ornata*) in North Texas (*continued*)

The observations on iNaturalist are still quite valuable, as long as we are careful about what conclusions we draw from them. Reports of numerous Plains Box Turtles in Wise County show that the species is still there, and that it might be a viable population and not just a few stragglers. And, the more people who report sightings, the more confidence we have that changes over time don't just reflect someone moving out of (or into) the area. That is the logic of scientific experiments comparing groups: the larger the groups, the less it is likely that some random difference accounts for the results. So, the more people reporting, the stronger the resulting data.

Let's take a look at what the citizen scientist data show about Plains Box Turtles in the counties surrounding Dallas and Fort Worth (Wise, Parker, Hood, Denton, Johnson, Ellis, Kaufman, Rockwall, and Collin counties). Within my iNaturalist account, I clicked "Explore" and entered *Terrapene ornata* in the "Species" field and entered each of the counties in the "Location" field. I was then able to look at the data and, for most observations, the time of day that the turtle was seen. The species was reported 43 times. The earliest observation was in August of 2011 and the most recent was in May of 2019, three days prior to this data analysis. Most of the observations occurred in 2017 and 2018 (twelve observations each), but this probably reflects the increasing popularity of iNaturalist. There were only three observations in 2016 and none in 2012 and 2013.

Differences in observer effort were likely shown in the fact that there was only one observation in Parker County and twelve in adjacent Wise County. Many of the Wise County observations were contributed by one enthusiastic herpetology graduate student living in that county. It is unlikely that the population of Ornate Box Turtles is twelve times greater in Wise than in Parker County.

With these limitations in interpretability of the data, a few trends are worth noting, even if they are not surprising. The greatest number of observations were reported in May and June, after the turtles are moving about mating and nesting (Figure 1). Breaking the monthly observations out by year shows considerable year-to-year variability; for example, May contained as many as four observations per year and as few as zero (Figure 2).

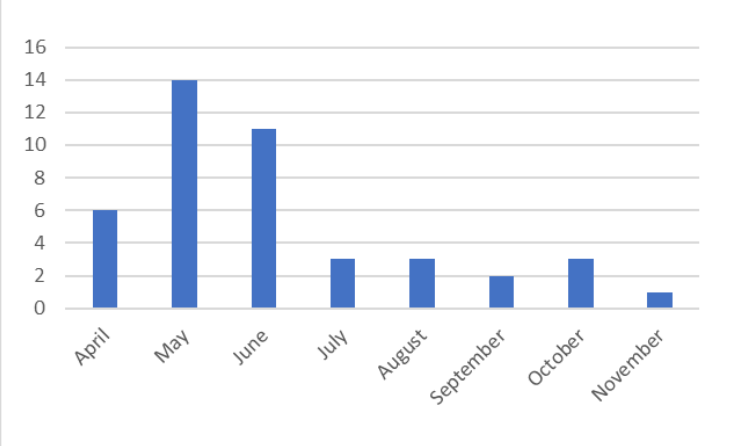

Figure 1. Number of turtles reported, by month

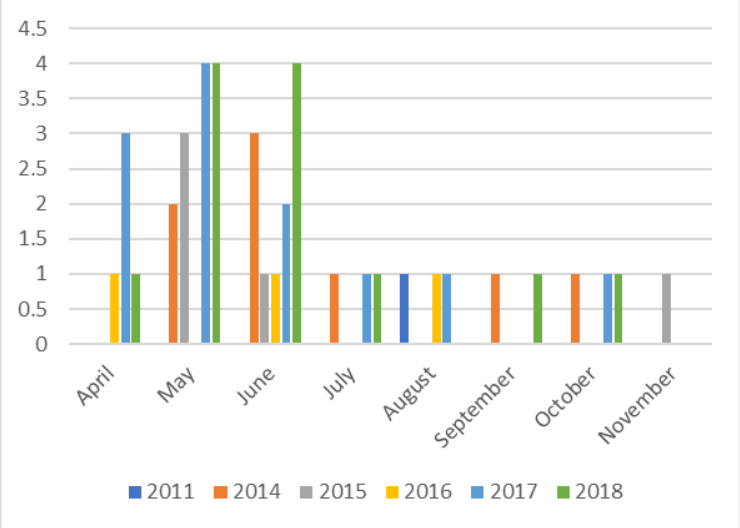

Figure 2. Number of turtles reported, by month, for each year

The counties surveyed contain some historically Blackland Prairie and Eastern Cross Timbers in the east, and Grand Prairie and Western Cross Timbers in the west. The Plains Box Turtle ranges throughout north central Texas (Dixon, 2013), but these turtles often inhabit drier, upland grasslands or open woodlands and are unlikely to be as common in east Texas. Arbitrarily using the Tarrant-Dallas

The Ornate Box Turtle (*Terrapene ornata*) in North Texas (*continued*)

county boundary as a dividing line, there were only six observations from Dallas County eastward, and 37 observations from Tarrant and Denton counties westward (Figure 3). Several issues need to be taken into account

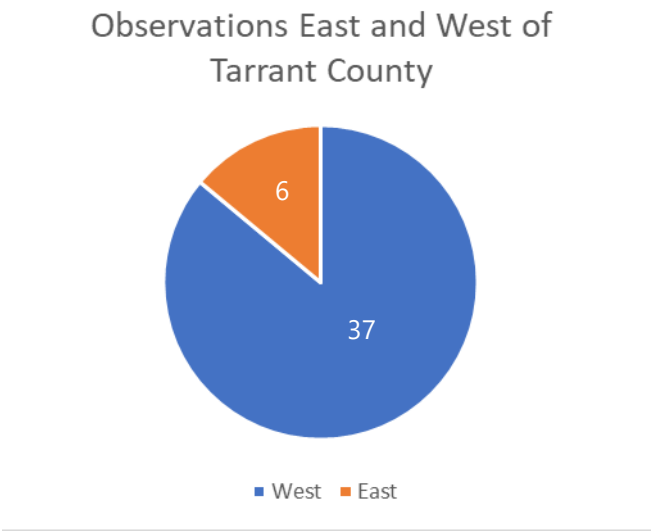

Figure 3. Turtles observed east and west of the Tarrant/Dallas County line

when interpreting the east vs. west data. One is that some observations in urban Dallas (one was found on a city street, trying to climb a curb) likely reflect translocated turtles such as escaped pets. Other issues include the different numbers of observers and different levels of effort. On the other hand, it is not surprising to see more robust numbers of this species in the western part of the metroplex, both because the habitat appears to be a better match and because the degree of development and road fragmentation is greater in the eastern half of the Dallas-Fort Worth area.

The relatively limited data from these nine counties show a good deal of promise. As the total number of Master Naturalists and other interested citizen scientists grows, the data set should continue to grow and to become more interpretable, with less of the artifact and bias discussed above. With development claiming more habitat in north Texas every year, and with turtles in decline everywhere (Lovich, et al., 2018), box turtles need as many people looking after them as possible.

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A few additional notes:

- Please share this issue with fellow biologists and naturalists, students, and nature-lovers. Ideally it will be a "journal" both in the sense of a publication covering north Texas ecoregions and as a shared record of what we observe and learn. That can only happen if *you* contribute to it!
- The Journal is available on our Facebook Community page under "Files" — https://www.facebook.com/groups/PostOakPrairie/files/
- Please join the discussion on that community page, and "like" the Journal's page — https://www.facebook.com/PostOakPrairie/
- You can read the Journal using the Issuu website or app, at https://issuu.com/postoak-prairie
- Contact us at popj.editor@gmail.com