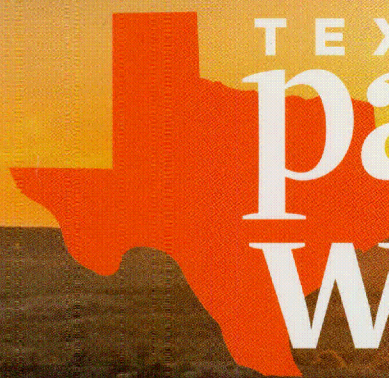


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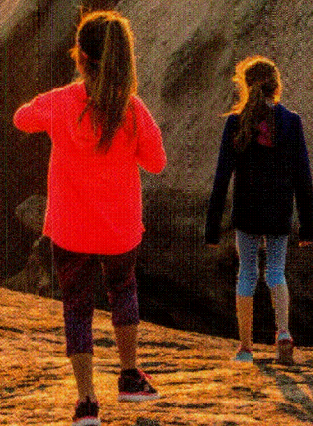
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THE YEAR OF STATE PARKS: ENCHANTED ROCK

Nature's Playground

The granite goliath inspires imaginative excursions for kids of all ages.

by Melissa Gaskill

PLUS: Nine State Parks Perfect for Kids, **Page 34**

PHOTO BY JONATHAN VAIL / TPWD

ON THE COVER: Two girls take in the sunset from the top of Main Dome at Enchanted Rock State Natural Area.
Photo © Laurence Parent

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Want healthier, happier kids? Take them outside!

by Jennifer Bristol

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Secrets of the Serpenterium: Texas A&M-Kingsville lab explores beneficial uses of snake venom.

by Reeve Hamilton



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↑ "THE OLD TEXAS BLUEBONNET IS A RITE OF SPRING. IF THAT DOESN'T SAY 'SWEET MOTHER TEXAS,' I DON'T KNOW WHAT DOES."

—JOHN R. THOMAS



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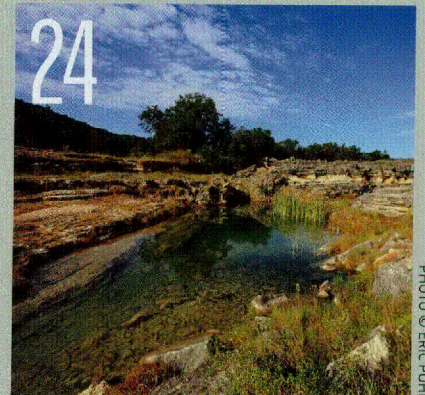


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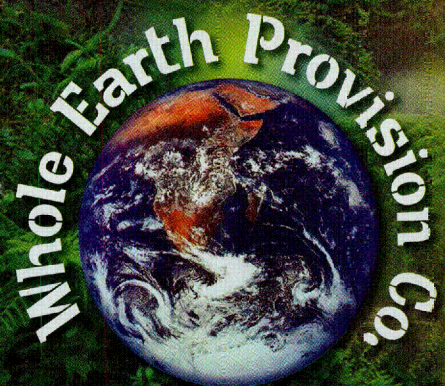


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FOR KIDS, OUTSIDE BEATS INSIDE

THE ROUTINE IN OUR HOUSEHOLD is an eminently predictable one. My beloved bride will ask sweetly if I want to bring young Ryland inside for his nap or his dinner or his bath or whatever the activity is that she thinks demands his presence indoors.

As we husbands all know, it really isn't a question. So, I will dutifully arise from whatever it was I was otherwise peacefully doing and brace myself for what's inevitably ahead.

Here is how it will play out. Ryland will be, how shall we say, utterly less convinced than his mother that his presence is actually required indoors at that time of calling. In fact, if men really do suffer from selective hearing, as some wives will claim, I am utterly convinced it clearly starts as a toddler with a call to come inside!

Oh, I can readily envision what is going on in that little mind of his when I call out to him to come indoors. "Why in the world would I want to do that? There are no rocks to throw, sticks to swing, mud puddles to jump into, bugs to catch, squirrels to chase, balls to kick and throw, holes to dig or flowers to trample."

For the old movie buffs among the readers, let me simply say that the famous car scene in the *French Connection* has nothing on the chase around our backyard trying to bring the elusive Ryland inside.

Assuming I can catch the little bush-whacker, I will go through the standard inspection and observations I have come to expect. Sand all throughout his curly hair? Check. Pebbles in the shoes? Of course. Rocks in his pockets? All of them. Mud on his new shirt, britches and shoes? No doubt, lots of it. Dirt-encrusted hands? Check.

Then comes the negotiation. He usually doesn't wait for me to start. "I go outside," he wails plaintively. "You already are outside," I patiently tell him, "but now we are going inside." "No, I stay outside," he declares with all the full-throated power and gusto a 2-year-old can muster. "Your Mom said you need to come inside," I tell him, still thinking I can somehow reason with the little creature. "No, I can't, I can't!" he insists emphatically. "What do you

mean, you can't?" I ask incredulously. And, before I know it, he has somehow broken away from my grip, and the chase is on again ...

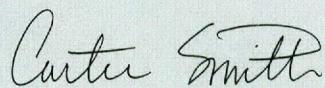
His grandmothers and mother will cringe if they see this (so don't let them read this, please), but from my vantage point, raising Ryland is about like raising a little feral hog. Ryland outside is much preferable to Ryland inside.

I don't think that was exactly what my colleague Jennifer Bristol had in mind when she wrote the wonderful piece in this magazine about 35 ways to get out and play outdoors with your kids. But her message about raising happier and healthier kids is all about getting them from the indoors into the outdoors. From studying the stars to making a fort to going on a scavenger hunt to catching a fish to chasing fireflies, most every activity can be done in a setting very close to home.

For those looking for ways to augment those experiences, I would encourage you to read up on Dale Blasingame's article, "Nine Parks Kids Love." Like Jennifer, Dale emphasizes that the real purpose of playing games in nature or spending time together at a state park is making meaningful memories for the kids and as a family. And, with a long list of places to go, see and do inside your state park system, from the famous tracks at Dinosaur Valley to the spring-fed pool at Balmorhea to the sandhills in Monahans, there is something for every kid to love and remember.

If you are a regular reader of this magazine or follower in general of this department, you know that our tagline is "Life's better outside." But don't just trust us on it. I hope you'll use this spring to see for yourself by taking your family to experience the bounty and beauty of nature that await you in the Texas outdoors.

Thanks for caring about our wild things and wild places. They need you now more than ever.


EXECUTIVE DIRECTOR

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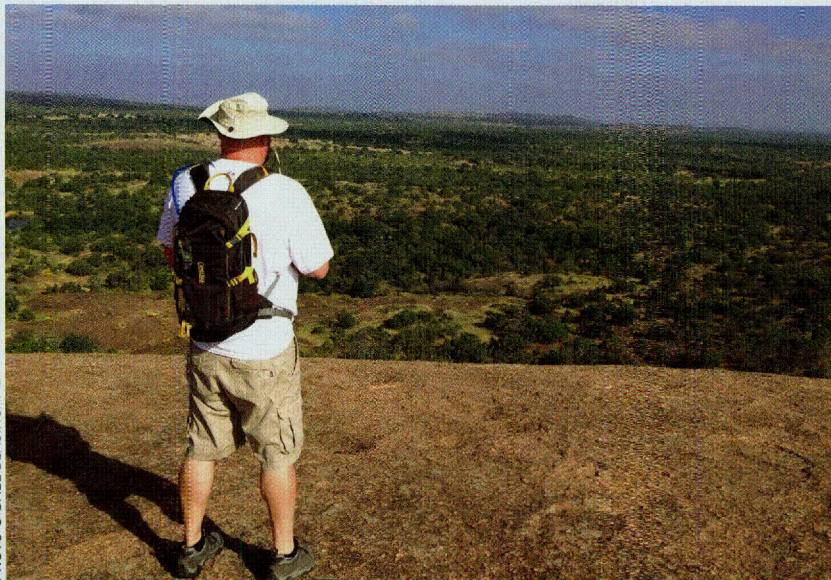


PHOTO © DALE BLASINGAME

NEXT ASSIGNMENT: TIME IN THE PARKS

I have one possible answer to Dale Blasingame's final question, "What now?" posed in the article "One Is Not Enough," after he visited all 95 Texas state parks in 367 days.

You've had an enviably wonderful introduction to the wealth of nature around the state, and you wrote you "didn't feel as though [you] missed anything." Now, pick a favorite park or any natural area. Visit it again and again over the course of a year (to start). Visit in all kinds of weather, and at different times of the day or night. Notice the changes over seasons. Learn the names of all the plants and animals that live there, if you possibly can. Look for them and watch their behavior. Learn about the geological processes that shaped the place over eons and continue to change it.

You might even volunteer there, removing invasive plants or picking up litter or guiding tours. After many trips to that park, I bet you will "understand its essence" even better than you thought you did from your fly-through adventure.

LISA KAY ADAM
Edinburg

WINNING WILDLIFE IDEA

I'm a fourth-grader at an elementary school in Goldthwaite and entered a project in a science fair there. I chose to do my project on a wildlife-related topic. I did my project and presentation on how effectively lunar charts predict wildlife feeding activity.

I was pleased that the science fair judges liked my display and presentation. I won first place in my division. I was invited to present my project at a school board meeting. That also went very well. A board member offered to let me display my project at his sporting goods store.

My dad reads your magazine on a

regular basis and says we need to do things that promote hunting, fishing, nature conservation and outdoor education.

COLTON ESSE
Goldthwaite

FORTS VITAL TO TEXAS

One morning in November, we checked into Fort Richardson State Park in Jacksboro, and the next morning I opened the December issue of *Texas Parks & Wildlife* magazine, which we have subscribed to for years. In the At Issue column of the magazine, you mentioned that in 2016 TP&W magazine is going to be featuring

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different iconic parks. This has to be a daunting task, as there are so many iconic parks, but I look forward to your list.

Some of my favorite parks are the historic forts, and I hope that at least one will make your list. One of my favorite memories is being at Fort McKavett when the re-enactors were there. It made the history of the area come to life. These forts were vital in building Texas, and they need to be remembered.

Thank you for a great magazine about Texas state parks.

KYLE NELSON
Sanger

PANHANDLE PARKS

The January/February issue was one of the best ever, and recalled our October visit to the Caprock. My wife and I entered the Panhandle via Interstate 40 from Oklahoma en route to Palo Duro Canyon State Park, and the view of the rolling plains of the eastern Panhandle was alone worth the trip. Palo Duro was as awe-inspiring as we expected and an adventure every Texan should experience. After Palo Duro, we anticipated less on our stop at Caprock Canyons, but the scenery was incredible, and we got a great close-up photo of a buffalo bull.

DENNIS MCCAULEY
Fort Worth

CORRECTION: A photo on Page 12 of the March issue was incorrectly credited. It was taken by Cathy Burkey of the Dallas Zoo.

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Texas Parks & Wildlife magazine is edited to inform readers and to stimulate their enjoyment of the Texas outdoors. It reflects the many viewpoints of contributing readers, writers, photographers and illustrators. Only articles written by agency employees will always represent policies of the Texas Parks and Wildlife Department.



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FROM THE EDITOR

WHILE EVERY ISSUE of *Texas Parks & Wildlife* magazine is a labor of love, my heart soars when we get to focus on children and families. The seeds of stewardship are planted during these first picnics in the park, first sunsets over the mountains, first shells gathered on the beach and so many other shared experiences. We cherish these memories from our childhood and try to pass them on to our children.

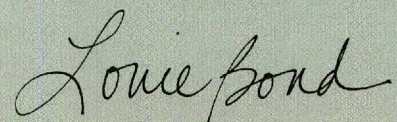
In March 2008, we published an enormously popular article, “50 Ways to Get Kids Hooked on the Outdoors,” inspired by the publication of Richard Louv’s *Last Child in the Woods*. The article included a review of Louv’s book by my oldest daughter, now 31, who wondered if she “may have been the last child in the woods.” Sarah saw the difference between her childhood, spent playing in the woods around our home, and that of her little sister, seven years younger, who had the added distraction of computer games and DVDs and spent more time indoors.

Sadly, in the ensuing eight years, the distractions have multiplied, so we felt it was time to help families embrace the spring sunshine and resurrect those childhood playtime activities that we remember so fondly. After all, in addition to the fun of it all, the health benefits abound — physical, mental and emotional. Who better than our own Children in Nature representative at TPWD in Austin, Jennifer Bristol, to help us find new ways to share happy family time outdoors?

Jennifer recalls taking a group of teens camping several years ago. One young man, Michael, alternated between rebel and class clown during the early part of the trip, but his attitude changed when they took a hike through the burned forest at Bastrop State Park. He looked at one tree and remarked, “That one must be so lonely. It lived, but all its friends are gone.” At the campfire that evening, Michael shared with the group the loss he dealt with in his own young life. “I want to come visit these trees more,” he said. “I think they need to know someone cares about them, and that they aren’t alone.”

Whether you’re leading a Scout group up to the summit of Enchanted Rock or taking your kids deep into Longhorn Cavern to marvel at rock formations, remember that these are the moments that shape lives, heal wounds and open hearts to the wonder of the natural world.

Who knows? That curious child with dirty fingernails and an ear-to-ear grin may grow up to be the next great nature photographer, the next magazine editor, the next executive director of TPWD or the next secretary of the interior. Plant your seeds and watch them grow.



Louie Bond, Editor

Sea Center Texas Celebrates 20 Years



PHOTO BY CHASE FOUNTAIN / TPWD

FOUNDED IN LAKE JACKSON in 1996, Sea Center Texas (tpwd.texas.gov/seacenter) celebrated 20 years of operations as an aquarium and hatchery in March. More than 1.2 million people have passed through Sea Center's doors since its opening. The center's size, daily operations and free admission require a large volunteer base to support staff.

This year's annual banquet honored these volunteers, including seven who have served since the beginning. Two volunteers have even worked the same Thursday afternoon shift together since 1996 — and have no plans of quitting anytime soon.

Volunteers of all ages come to Sea Center to not only give back to their community but also to have a little fun. While their primary mission is to educate visitors about marine life and the Gulf of Mexico, they forge many human connections as well. The greeters, tour guides and gift shop attendants are whom the visitors remember long after their visit is complete. They are the true face of the organization.

— Julie Hagen

BioBlitz for Citizen Science

CELEBRATE THE FIRST nationally recognized Citizen Science Day by participating in a BioBlitz at Commons Ford Ranch Metropolitan Park in Austin on April 16 and 17. The public is welcome to join in at any point during the day (the park is open 5 a.m. to 10 p.m.), but the best time to arrive is between 9 a.m. and 2 p.m. Introductions and expert-led walks start at 9 a.m. You can meet members of different naturalist groups and learn about what is being documented at the park. At 1 p.m. there's a discussion on the different habitats of Commons Ford and the notable species documented during the event.

Learn about local biodiversity and discover how you can contribute by reporting your observations. Meet experts from the Travis Audubon Society, Native Plant Society of Texas, Texas Master Naturalists, Native Prairies Association of Texas, Austin Herpetological Society, the Lady Bird Johnson Wildflower Center and TPWD's Texas Nature Trackers program.

Check out the BioBlitz page at inaturalist.org/projects/bioblitz-at-commons-ford.



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Tree stand safety; Pecos pupfish; prairie dog town; Buffalo Soldiers connection; sandy sunset.

APRIL 3–9: The Texas Water Safari; loggerhead shrike nests; hungry woodpeckers.

APRIL 10–16:

The Powderhorn Ranch story; preaching taxidermy; wild television history; caterpillars.

APRIL 17–23:

Big Bend National Park.

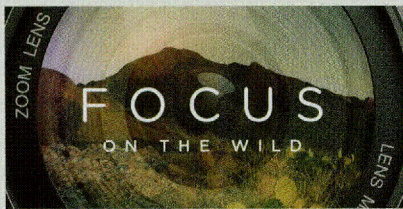
APRIL 24–30:

Texas State Railroad; brushland birds; pier fishing; Smith Oaks rookery; Big Woods.



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Photo Contest Invites Entries



THIS YEAR, Texas Parks and Wildlife Foundation (TPWF) is commemorating 25 years of supporting conservation projects across the state. A yearlong photo contest is part of the celebration, and you can be part of it by sharing your best outdoor photographs.

Winning photos will be featured on TPWF's website and social media channels and the *Texas Parks & Wildlife* magazine website. A different theme will be featured each month. April's theme is freshwater fishing, and entries will be accepted until April 25. *Texas Parks & Wildlife* magazine chief photographer Earl Nottingham will select the winners and provide photo tips to the winning photographers. Winners will also receive a special prize from our sponsors and partners.

In early 2017, a selection of the best photos will be published in the pages of *Texas Parks & Wildlife* magazine. Find out more about the contest at tpwf.org.

— Lydia Saldaña

THE STAGE IS SET FOR THE CALL OF THE WILD

One of many of the residents of Saint Francis Wolf Sanctuary

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PBS Film Highlights Texas' National Parks

TEXAS IS HOME to 16 National Park Service sites, and those special places are the featured attractions in the new PBS documentary *The National Parks of Texas: In Contact With Beauty*.

The film marks the centennial of the National Park Service and highlights the natural, cultural, historic and recreational significance of national parks in Texas. It will air April 26 on PBS stations across the state.

Big Bend National Park was the first Texas site to become part of the National Park Service; others that followed include Padre Island National

Seashore, San Antonio Missions National Historical Park and Big Thicket National Preserve. In 2015, Waco Mammoth National Monument became the latest addition.

"Our country's national parks are a remarkable achievement, preserving spectacular landscapes, special pieces of our shared history and unique species," says Kierstan Schwab, Texas PBS executive director. "We are proud to have the opportunity to bring to our viewers this amazing celebration of the parks that are right here in Texas, right in our own backyards."

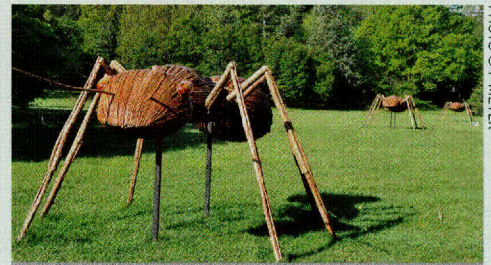


PHOTO © P. MEYER

'Big Bugs' Invading Orange

The oversized fun of David Rogers' *Big Bugs* will be featured at Shangri La Botanical Gardens in Orange through May 28. The exhibit includes 10 sculptures of larger-than-life insects and arachnids made from all-natural materials. After you check out the exhibit, stroll over to the Stark Museum of Art for a companion "Bugs" exhibit featuring Rogers' behind-the-scenes work, an exhibition of rare natural history books and juried bug art by Texas students.

—Emily Moskal

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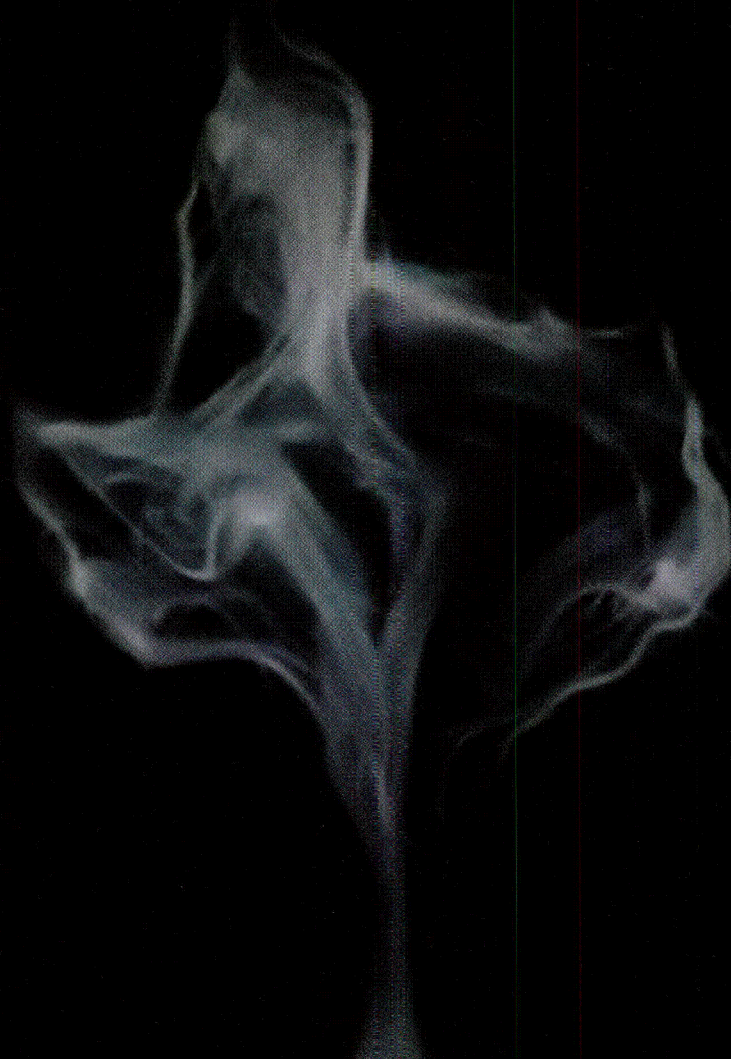
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BIG BEND MUD TURTLE

Limited water is a big hurdle for a threatened turtle.

BY ANDY GLUESENKAMP

THE VAST CHIHUAHUAN DESERT landscape of the Big Bend region seems an unlikely place to find a turtle, but the Rio Grande is home to several species (such as the Rio Grande cooter, Big Bend slider, spiny softshell turtle and red-eared slider), and you may even spy a desert box turtle ambling across a lonesome caliche road.

The most unusual turtle in this region is the rough-footed mud turtle, also known as the Big Bend mud turtle or Chihuahuan mud turtle. This small turtle (adults reach about 7.5 inches) ranges from Texas to the Mexican states of Chihuahua and Coahuila. It is highly

aquatic and prefers rivers, streams and lakes. Of course, water is in short supply in the Big Bend, so this species is known to inhabit only a short stretch of creek and a handful of cattle tanks fed by springs and wells in Presidio County. Most Texas populations are dependent

on human-modified habitats (cattle tanks) that have largely replaced historic habitats (flowing streams).

The rough-footed mud turtle sometimes shares its home with another species of mud turtle: the yellow mud turtle (*Kinosternon flavescens*). Both species have peaked carapaces as juveniles, hinged plastrons (belly plates) and fleshy barbels under the chin. The rough-footed mud turtle has a single, V-shaped head shield. The male has nominal scaly patches on the hind legs and a relatively long tail with scattered fleshy spines. The turtles have large heads for their size (they are the smallest species of turtle in the Trans-Pecos region) and a prominent overbite in profile view.

COMMON NAME

Rough-footed mud turtle

SCIENTIFIC NAME

Kinosternon hirtipes

HABITAT

Permanent water bodies in the Big Bend region, now primarily cattle tanks in upland mesquite grasslands

DIET

Crustaceans, snails, aquatic insects, worms, fish and amphibians

DID YOU KNOW?

In Texas, the threatened rough-footed mud turtle is found only in southern Presidio County.

Numerous threats to this species exist. In addition to the inherent fragility of having few populations that occur in isolated pockets of habitat, free-ranging cattle have affected creek habitat, and human alteration of tank sites may have had unintended consequences on turtle populations.

Much of the mud turtle habitat in Texas is adjacent to roadways, railways and a proposed pipeline. How infrastructure affects mud turtle populations is unknown. The Texas Parks and Wildlife Department is currently funding research on the movement and behavior of mud turtles, using radio telemetry to track individual turtle movements, home range size, seasonal activity and habitat use. This information will help determine the nature and severity of threats facing this species.

In addition, the Texas Department of Transportation has applied turtle-specific conservation measures to sites on state property, and local landowners are engaging in conservation and restoration practices to help ensure that this rare Texas turtle lives on, thriving in the most unlikely of places. ★

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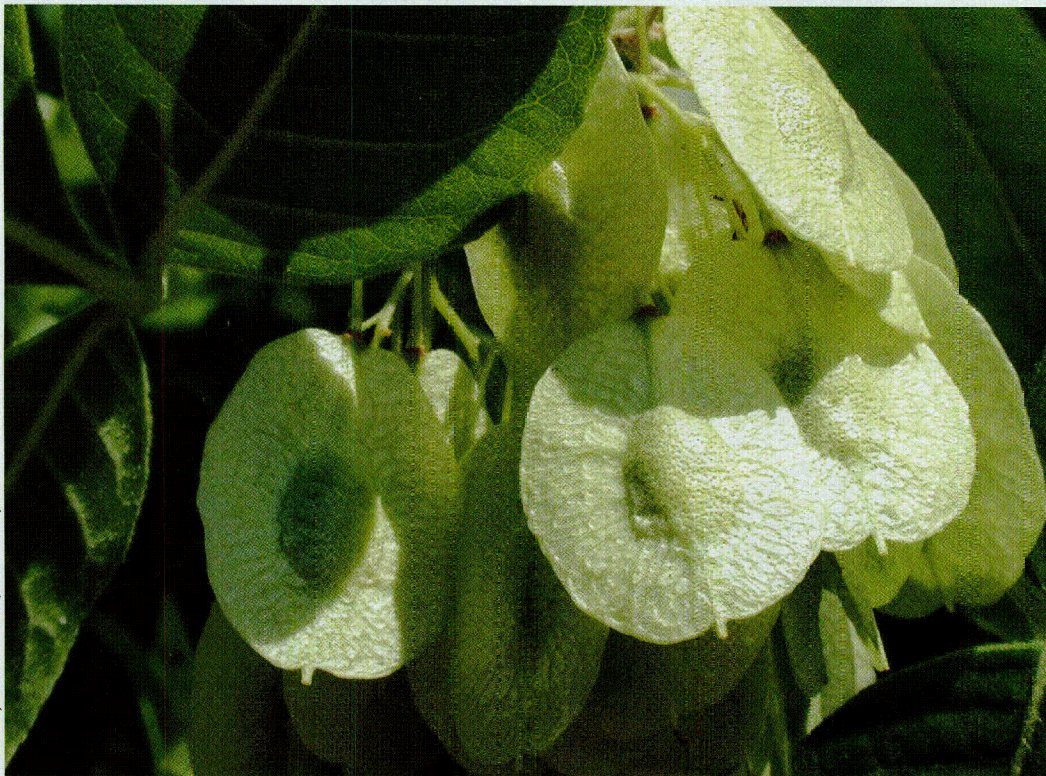
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COMMON NAME

Hoptree, wafer ash

SCIENTIFIC NAME

Ptelea trifoliata

SIZE

Up to 20 feet tall

DID YOU KNOW?

Not just a beer ingredient, the hoptree is a favored host of the giant swallowtail butterfly.

POTATO-CHIP TREE

Wafer-like hoptree seeds were substituted for hops in early immigrants' beer brewing.

BY JASON SINGHURST

BACK AT THE turn of the century, my workplace moved from Fort Parker State Park to Austin. I recall my first summer in Central Texas. On a friend's recommendation, I trekked out to Hamilton Pool and Westcave Outdoor Discovery Center, famed nature preserves with grottos (collapsed caves) containing crystal-clear spring pools. Traveling between these preserves, you wind along Hamilton Pool Road, cross the Pedernales River and climb a steep hill. As my truck chugged upward, I was drawn in by the unusual wafer-like appearance (almost like potato chips) of the hoptree fruits as they dangled by the hundreds from the shrubs scattered along the shaded canyon slope.

PHOTO © LOUISE HASTY / LADY BIRD JOHNSON WILDFLOWER CENTER





PHOTO © JOSEPH MARCUS /
LADY BIRD JOHNSON WILDLIFE CENTER

Hoptree, also known as wafer ash (*Ptelea trifoliata*), is an attractive deciduous shrub or small tree. Hoptrees can reach a height of 20 feet and have a central trunk up to 6 inches wide. Hoptrees are identified by their distinct shiny, dark green leaflets of three that range from 2 to 5 inches long.

The plant is dioecious, bearing male and female flowers on different trees. The fruit (samara) is a distinctive disc-shaped wing resembling a wafer or potato chip. Hoptrees flower in early spring with greenish-white flowers produced in terminal branched clusters. Hoptrees are sometimes called stinking ash in reference to their unpleasant smell. The genus name of *Ptelea* is from the Greek word meaning elm, which indicates the similarities between hoptree and elm seeds.

In Texas, German immigrants in the 19th century used hoptree seeds in place of hops for beer-making, leading to its common name.

Hoptree is a great native tree that's highly deer-resistant but does attract bees, wasps, flies and ants. Caterpillars of the giant swallowtail butterfly feed on the leaves. In Texas, hoptrees are found in the north-central, central and eastern parts of the state along with a narrow band in the southwest. Plant enthusiasts can easily encounter this tree with its showy seeds throughout the summer and fall along wooded hillsides and in most state parks in Central Texas.

I continue to look forward to the seeds of the summer fruiting of hoptrees just as I did on my first encounter above the Pedernales River. I pull over at least once every summer on my way to work along a little turnout on Onion Creek in South Austin to observe this majestic member of the citrus family. Check out the attractive wafer-like seeds when you are exploring Texas landscapes this year. ★

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PHOTO BY EARL NOTTINGHAM / TPWD

THE BLUE HOUR

After the sun goes down, the first few minutes of evening present a special photographic opportunity.

BY EARL NOTTINGHAM

OUTDOOR PHOTOGRAPHERS often use the terms “magic light” and “golden hour” to denote the special light when the sun is low in the sky and nearing the horizon — resulting in intense yellow and orange colors and providing a low directional spotlight that skims across the landscape, sculpting and defining the shape and texture of illuminated objects.

A serious photographer may even sit in one location for several hours waiting for that magic light, which typically begins to occur about one hour before sunset and lasts until sunset itself. In reality, the best magic light or golden “hour” may offer a window of only five to 10 minutes in which the magnificent evening light has its most artistic and visceral impact.

Oftentimes, photographers will take that last image just as the sun disappears on the horizon and then pack up the camera bag and head home. If they do that, they will miss a special opportunity that is only then beginning to present itself: The Blue Hour.

Right: In a Blue Hour moment, the warm colors of the clouds and mountaintops contrast with the cool colors of the sky at dusk in the Alabama Hills of California.

Left: In the later minutes of the Blue Hour, the deep blue sky provides a dramatic backdrop for the skyline and the Margaret Hunt Hill Bridge in Dallas.



PHOTO © EARL NOTTINGHAM

The evening Blue Hour begins roughly 10 to 15 minutes after sunset, or when the sun dips approximately 6 degrees below the horizon. This is the period of civil twilight in which the sky begins to take on a rich blue hue that gradually darkens as astronomical twilight comes on, eventually turning to the black night sky. The early minutes of Blue Hour are often great times to capture high clouds or mountaintops that still have some sunlight illuminating them, creating the visual vibrancy of warm colors against the cooler sky. It is also a prime time to photograph a rising full moon.

The later minutes of Blue Hour provide the best scenario for photographing city lights against the sky. Again, there is a small window of opportunity of only five to 10 minutes in which the deep blue sky provides the optimum background for the luminance of street, building and vehicle lights. For those photographers who enjoy using hand-held lights to paint buildings or other subjects with light, this is a great time to make the exposure.

Waiting any longer will result in a loss of the blue hues and a quick transition to the black night sky, which offers its own unique shooting opportunities — primarily celestial photography. Since night eventually turns to day, you also have a Blue Hour before the sun comes up in the morning. The same lighting conditions occur but in reverse, leading

into the morning “golden hour.”

Blue Hour demands some special considerations in order to get the best possible photograph. By the nature of the time, light levels are very low, which immediately indicates that a sturdy tripod is a must. Exposures can easily go up to a few seconds, so hand-holding is not an option. Try to eliminate any camera motion by using an electronic cable release or using the camera’s timer to avoid any hand-to-camera contact.

Take advantage of your camera’s higher ISO settings to gather more light, enabling faster shutter speeds. Be careful to not use such a high ISO that unflattering digital noise begins to show up in the images. Assuming you are on a tripod, an ISO range of 100-400 should be more than enough. If you are shooting only a JPG file (not RAW), try to avoid the Auto White Balance (AWB) setting and opt instead for the Daylight or Tungsten color balance. This will help ensure that your blue sky is rendered a deep blue.

Finally, for planning a shoot, consider using a smartphone app that provides sunset, sunrise and twilight times as well as information on celestial events.

The amazing sensitivity of current digital cameras opens up low-light shooting opportunities that previously didn’t exist or were very difficult (and expensive) to obtain. So whatever you do, don’t quit shooting at sunset. The party’s just starting! ★

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Please send questions and comments to Earl at earl.nottingham@tpwd.texas.gov. For more tips on outdoor photography, visit the magazine's photography page at www.tpwmagazine.com/photography.

RIDE READY

The three C's of bicycle maintenance.

**BY STEPHANIE LONG
& CALEB HARRIS**

PHOTOS BY SONJA SOMMERFELD / TPWD



FOR SOME ENTHUSIASTS, there's no better way to experience a state park than from the saddle of a bicycle, whether it's a smooth cruise on paved park roads or a bumpy thrill ride through a woodland trail. The cool wind in your face, the silent speed, the ability to take in more miles (and sights) than on foot... all these and many more reasons lead us to long for a bike ride as the weather warms. Mechanical breakdowns can spoil the fun, but we've got a few tips to help you pedal through paradise without worry. Local bike shops often give classes on bike repair and maintenance; here's a link to a helpful TPWD video, too: http://youtu.be/5_1NFR2hPXs.

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- RAGS/TOWELS
- CHAIN LUBE
- TIRE PUMP



CLEAN

After every ride, clean components until everything's free of dirt and debris.

Wipe down the wheel rims to assist in braking.

Hold the chain with a rag and pedal backwards, wiping off as much grime as possible, then reapply fresh lube to the chain.

Run strips of rag or cord between the gears to remove grime.



CHECK

Keep bolts and cables tight and tires inflated.

Check that all bolts are tight using an appropriately sized Allen wrench.

Inspect all cables; they should never be loose. Tighten cables by twisting the barrel bolt at the end of the cable.

Check air pressure and inflate tires to the recommended PSI (indicated on the tire itself) with a tire pump.



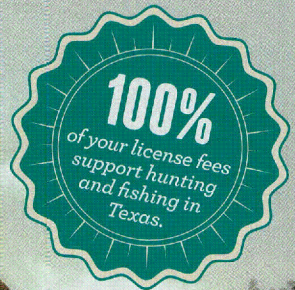
CENTER

The brake pads and gear derailleur should be centered. Wheels should spin freely; the derailleur shouldn't make noise or cause the chain to come off.

To adjust the brakes, start by loosening the bolt on the brake caliper with an Allen wrench. Adjust the brakes until the pads are evenly spaced on both sides of the wheel rim. Adjust the pads, using an Allen wrench, changing the angle or position if needed.

The derailleur can be adjusted by tightening the cable or adjusting set screws so that it changes smoothly and stops at the right places.

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THE GORGE

Raging floods unearthed ancient dinosaur tracks at Canyon Lake.

BY SHERYL SMITH-RODGERS
PHOTOS BY CHASE FOUNTAIN/TPWD



AUSTIN

1 hour

DALLAS

3.75 hours

EL PASO

7.5 hours

HOUSTON

3 hours

SAN ANTONIO

1 hour

LUBBOCK

5.75 hours

Long-tailed dinosaurs and seashell creatures once roamed the ancient shoreline where we're standing. Beneath our feet, flat bedrock stretches north and south to sheer limestone cliffs, crowned with ashe junipers and live oaks. The typical Hill Country terrain makes it hard to imagine that an ocean, complete with tides and mudflats, ever existed here.

However, my husband and I are about to see the fossil proof, unearthed in July 2002 by raging floods that tore through a wooded valley and violently carved out what's now known as the Gorge at Canyon Lake. Located west of San Marcos, the natural phenomenon has amazed thousands since public tours started in October 2007.

"Whoever finds the first dinosaur track wins a prize," the docent promises as our group of 15 begins the three-hour trek. *Won't be me, I think. I'm just here*

to see the gorge.

"Can we choose the prize?" pipes up a little girl in black sunglasses and a maroon T-shirt. Everyone laughs.

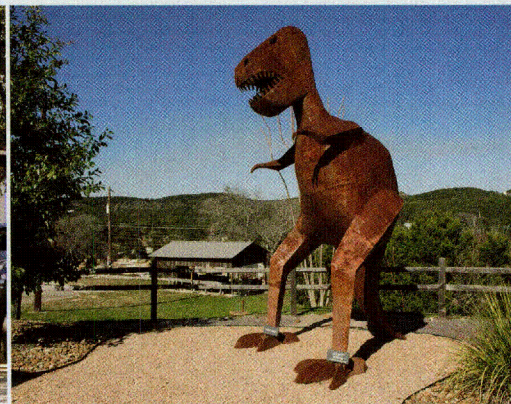
Sometimes the best getaways are close by. In our case, Canyon Lake's just a half-hour drive from home. So we're familiar with the lakeside communities of Hancock, Canyon City, Sattler and Startzville in addition to the lake's many parks and the beautiful Guadalupe River, which feeds the 8,230-surface-acre reservoir.

Brunch first. Whatever Granny D's Home Cooking in Canyon City lacks in looks matters little after we taste our breakfast tacos, piled high with scrambled eggs and diced bacon. Across the highway, we pop into Mrs. Bush's Pie Company to check out sweet treats. Since 2004, Marilyn Bush has run this funky bakery, decorated with knickknacks, newspaper clippings and witticisms scribbled on cardboard. Glass cases display her tempting fruit and nut pies, iced cakes and jumbo cookies. A bag of candied walnuts goes into our snack bag.

Overlook Park on the earthen dam's south end. This time, though, we take the Overlook Trail, a caliche footpath that snakes through junipers down to the lakeshore, where we continue our hike. I pause to watch honeybees at work on the creamy plumes of abundant poverty weed and golden clusters of waist-high tatalencho. Along the shore, gentle waves of clear water lap across the rocks.

Around the bend, a greater roadrunner dashes across the trail. We freeze. It does, too. We stare at one another. Then it sprints into the

pull off at the Rio Guadalupe Resort, our home base. Partners Bill Perkins and John Guenzel purchased the riverside property in 1977 and opened a campground. The resort also has river and fishing access. From December through March, Trout Unlimited and the Texas Parks and Wildlife Department stock points along the Guadalupe River with rainbow trout. Cold water continually released from Canyon Lake enables anglers to fish for trout year-round within 15 miles downstream of the dam. Bass, catfish and sunfish also inhabit the river.



FEATURED ATTRACTIONS (LEFT - RIGHT):

- ★ Canyon Lake Gorge
- ★ Rio Guadalupe Resort
- ★ Mrs. Bush's Pie Company
- ★ Heritage Museum of the Texas Hill Country

We might need those snacks after our afternoon hike. In the past, we've parked at Overlook Park and strolled the paved service road that tops the just-over-a-mile-long Canyon Dam, impounded in 1964 by the U.S. Army Corps of Engineers for flood control and water conservation. Around the lake, the Corps operates eight parks (four day-use and four camping), along with six hiking trails that include one equestrian trail and two biking trails.

Once again, we leave our car at

brush. Finally, the path peters into a jumble of boulders, so we turn around. Heads up: Based on our previous visit, the Guadalupe River North Trail and South Trail below the dam are well worth a venture. Anglers frequent the North Trail, which offers a fishing platform. Towering cypresses and lush vegetation envelop the South Trail, which meanders for more than a mile alongside the river.

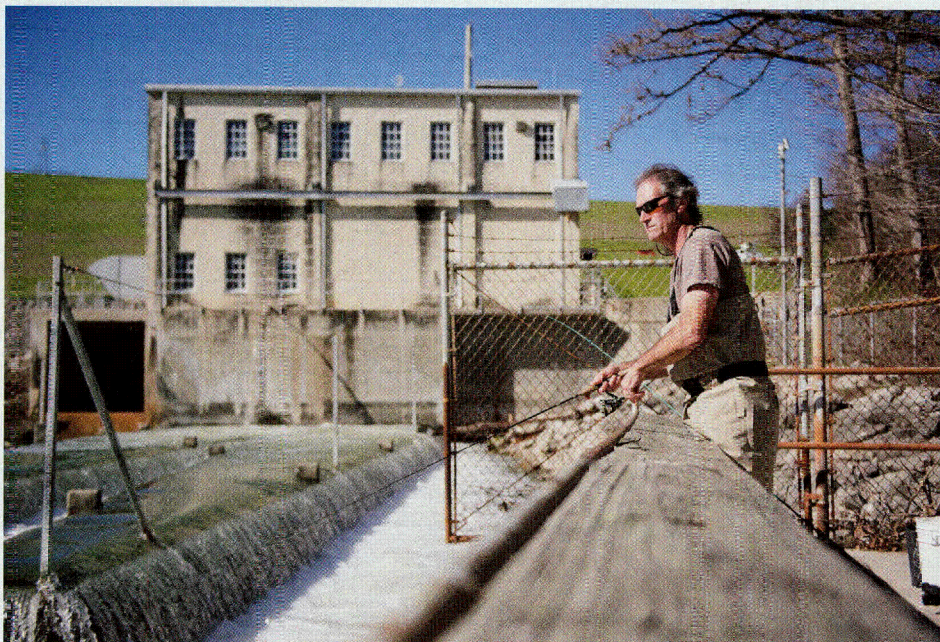
Day's end calls for a leisurely cruise down scenic River Road, a half-hour drive (one way) that crosses the Guadalupe River four times. The narrow road winds past limestone cliffs, private picnic grounds, weekend homes and rental cabins. Spectacular views of the cypress-lined river tempt us to stop, but no parking is allowed along River Road. Tubing and fishing outfitters provide river access and rentals.

At the Fourth Crossing bridge, we

The next morning, the resort's shuttle drops James and me off with two kayaks about two miles upriver. We put in on the end point of the river's mile-long "Horseshoe Loop" that fills up in the summer with tubers. Save for two fishermen on foot, we have the river to ourselves during our two-hour voyage.

Oh, the solitude of nature! As I dip my paddle in and out of the water, a belted kingfisher flits overhead. Northern cardinals, eastern phoebes and Carolina wrens call from the riverbanks, thick with bald cypresses and pecans. Red-eared sliders, basking on a sunny rock, slip into the water as we pass. A limestone outcropping, draped with maidenhair ferns and spider webs, summons me for a closer look.

Later, the Heritage Museum of the Texas Hill Country, midway between Startzville and Sattler, provides us



with a look at regional history, such as marine fossils, Native American artifacts and a Canyon Dam exhibit. After a brief tour, we head outdoors to see the museum's star attraction — dinosaur tracks embedded in limestone and protected by a huge pavilion. No one's allowed near the three-toed tracks, but a covered walkway encircling the structure gives a bird's-eye view from all sides. Experts believe that two gigantic dinosaurs — iguanodon and acrocanthosaurus — made the tracks more than 108 million years ago along an ancient seashore.

Our last day turns up even more prehistoric encounters in the Gorge. Ahead of time, we made online reservations through the Gorge Preservation Society. Guided tours are \$10 per person and limited to 23 people, ages 7 and up. Participants must wear sturdy shoes and carry bottled water; hats and backpacks are recommended. (Note: The tour is not recommended for people with heart conditions or bad knees or ankles, or those who are in poor health.)

Atop a hill in Overlook Park, we

Above and left: *The Heritage Museum of the Texas Hill Country features a demonstration fossil dig area and dinosaur tracks (believed to be from iguanodon and acrocanthosaurus) embedded in limestone. Kayakers paddle their way down the cypress-lined Guadalupe River below Canyon Dam. An angler tries his luck near the dam at Canyon Lake; the river is stocked with rainbow trout in winter months.*

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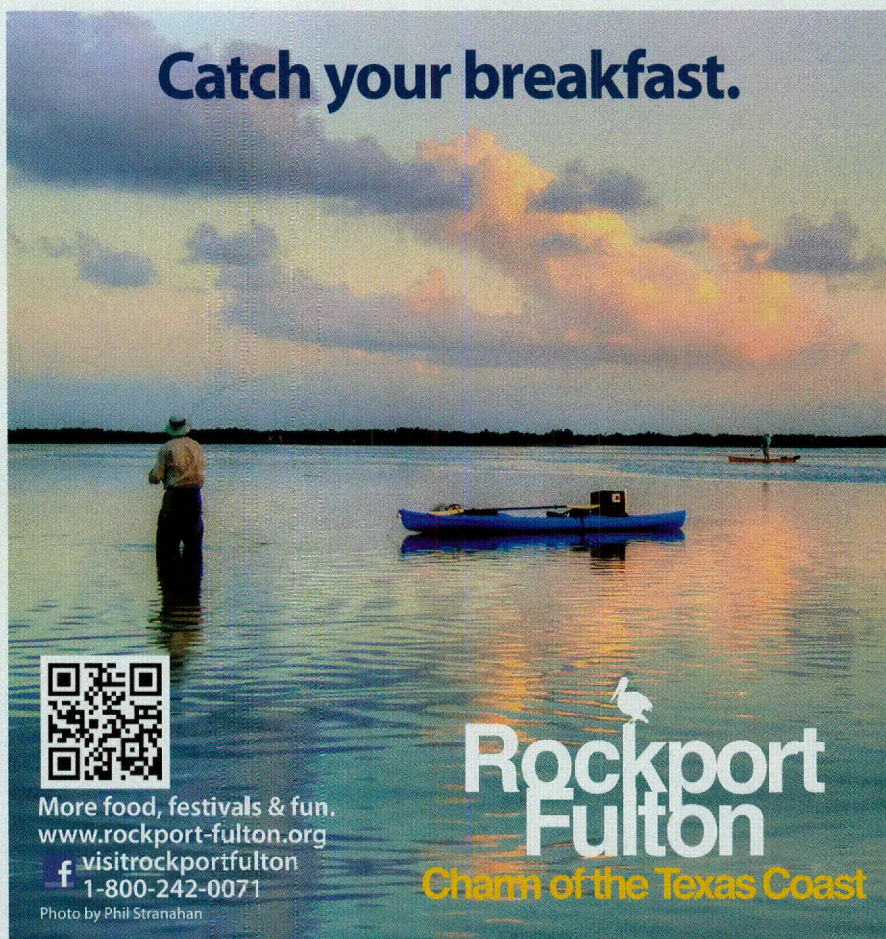
peer down on the dam's spillway while docent Kerry O'Neal explains how the gorge formed in July 2002. Simply put, a tropical depression dumped more than 30 inches of rain within a week into the Guadalupe River watershed and, subsequently, Canyon Lake. For the first time ever, incoming water exceeded the lake's capacity and gushed 7 feet over the 1,247-foot-wide emergency spillway with a rate that equaled one-third that of Niagara Falls.

The torrent's force tossed aside massive boulders and bulldozed through the earth until pouring into the Guadalupe River two miles away. Officials later estimated that debris torn out downstream from the spillway could have filled a football field from end to end, 300 feet deep. Six weeks later, the water receded, revealing an incredible canyon with depths up to 45 feet in some places. Fossilized treasures were also unearthed.


"I found a dinosaur track!" the little girl squeals at the same time I realize I'm standing on one.

"You both win!" O'Neal announces. "These tracks may have been made by acrocanthosaurus, a meat-eating dinosaur of the Hill Country. We're standing on what used to be a shallow ocean during the Cretaceous Period more than 110 million years ago."

From the spillway, we descend into the gorge via a series of wide limestone terraces. One's called Shell Flats, where O'Neal scoops up



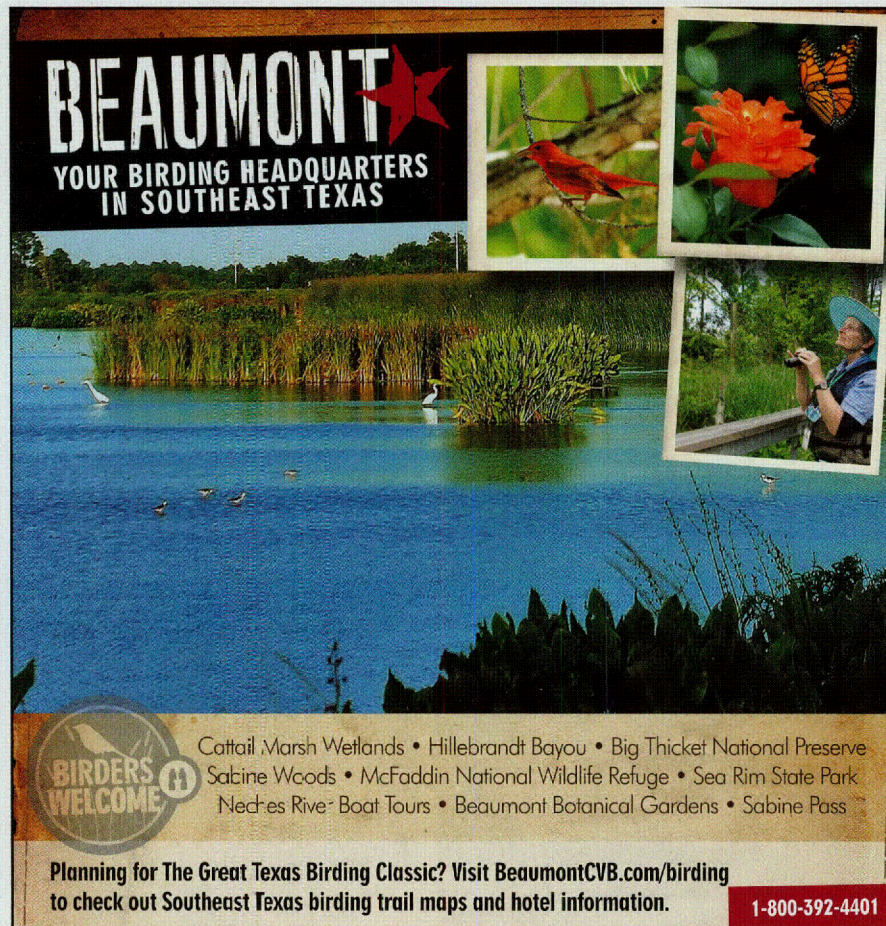
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A waterfall spills down a limestone outcropping in the Canyon Lake Gorge.



a palmful of tiny shells (*Orbitolina texana*) shaped liked disks. She also points out large gastropod fossils embedded in the limestone. On Curly Ledge, fossilized remnants of bivalve clams survive in the rock.

"Let's have a few moments of silence so we can hear the waterfall," O'Neal requests when we stop at a limestone cliff that drops off to a grassy bottom pocketed with small green ponds. "Lake water seeping beneath the ground feeds those ponds. Now let's see what the power of water can do!"

Bushy bluestem and other grasses tickle my legs as we follow O'Neal over limestone rocks and down caliche paths. We pass deep ponds and shallow pools within the gorge's gaping crevices. Near a moist seep fringed with river ferns, someone finds a juvenile western ribbonsnake. Above us, junipers cling to the edge of sheer canyon walls, laid open by the flood to expose rock strata.


Also exposed were more than


2,625 feet of the Hidden Valley Fault, a fracture long known about but never before seen until the gorge formed. We stand on the fault's broad, sheared-off surfaces while O'Neal points out slickinlines, long marks left where the rock slabs scraped against one another as they moved apart.

Our tour ends at Fossil Bluff, a low outcropping of sedimentary layers. O'Neal encourages us to search the crumbling wall of dirt and ground for marine fossils, such as snails, sea urchins and bivalves. But we must return everything we find; collecting is a felony offense.

Back at the preservation society's office, my new friend Cheyenne and I get to choose our prizes. She happily picks out a Gorge hat pin. I go for a mouse pad. Then we high-five. Dinosaur tracks and Canyon Dam rock! ★

Sheryl Smith-Rodgers is a writer and photographer who lives in the Texas Hill Country.




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BEST TIME TO VISIT?

Consider visiting on weekdays, as the park reaches capacity many weekends and holidays, closing temporarily until sufficient parking becomes available. Visitation is limited to protect the natural and cultural resources, the natural experience for visitors and the safety of visitors. Closure does not affect campers with a reservation.



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LOOSE PARTS.

A theory explained by author Richard Louv in *Last Child in the Woods* contends that the presence of many and different variables, or “loose parts,” sparks creativity. For children in particular, it makes open-ended, imaginative play possible.

Nature is filled with loose parts, and Enchanted Rock State Natural Area has them in spades.

PHOTO BY CHASE FOUNTAIN / TPWD

BY MELISSA GASKILL



Take rocks, for example. The namesake dome and others around it belong to a 62-square-mile batholith formation created more than a billion years ago when magma, or molten rock, oozed from far beneath the earth. The magma cooled and hardened into granite. For millions of years, the land around these bulges eroded away and exposed the domes. Since then, they, too, have been eroding, layer by layer, like an enormous onion peeled over millennia. Each exposed layer expands, splitting into sections that break into smaller pieces and slide off, leaving the next layer to crack and peel away. This exfoliation

hundred yards down the Loop Trail from the campground, turn right at a “Ground Fires Prohibited” sign, and follow a short, narrow trail to what rock climbers call the Carnivore Boulders. This jumble of enormous chunks of granite occupies children of all ages for hours. Whitener reports, with spaces to crawl through and surfaces to scramble up, clamber over and jump down. The higher spots offer great views, and secluded shady spaces among the boulders make nice picnic spots. Whitener confesses that he sometimes retreats here for a quiet lunch.

From the Carnivore Boulders, we walk out onto Little Rock. While



The Summit Trail threads upward through rocks and trees a short distance before opening up onto Enchanted Rock’s Main Dome. **The dome covers 640 acres and rises 425 feet to a high point 1,825 feet above sea level,** making the climb equivalent to huffing up the stairs of a 30- or 40-story building.



process has left rocks scattered around the domes, ranging from the size of houses down to gravel.

Park interpreter Scott Whitener calls these piles of rocks “nature’s playgrounds” and eagerly shows me his favorite. We walk about a

everyone needs to climb the park’s famous Main Dome at least once, Little Rock actually has more surface area and fewer people. In between these two domes is Echo Canyon, a loose-parts paradise: A trail of jumbled rocks leads down into a wide area shaded by tall trees and edged by two-story boulders practically begging to be climbed. From here, we glimpse Moss Lake before heading down the Base Trail. We follow this around the back of Enchanted Rock, between it and neighboring Freshman Mountain, past Frog Pond, back to the front of the Main Dome and the base of the Summit Trail.

The Summit Trail threads upward through rocks and trees a short

From top: Turkey Peak, one of the five peaks at Enchanted Rock State Natural Area, catches the sun with clouds overhead. Hill Country wildflowers offer a splash of color in spring. Sandy Creek winds through the park on its way to the Colorado River. **Opposite:** House- and car-size boulders cover the top and sides of Freshman Mountain.

EXPLORING THE PARK WITH CHILDREN? Enchanted Rock State Natural Area is one of many state parks offering Junior Ranger Explorer Packs for checkout. Each free activity pack includes binoculars, magnifying glass, animal tracking key, sketchbook, pencil, crayons and watercolors, guides and a journal. Kids can complete activities to earn a Junior Ranger badge or Enchanted Rock patch.

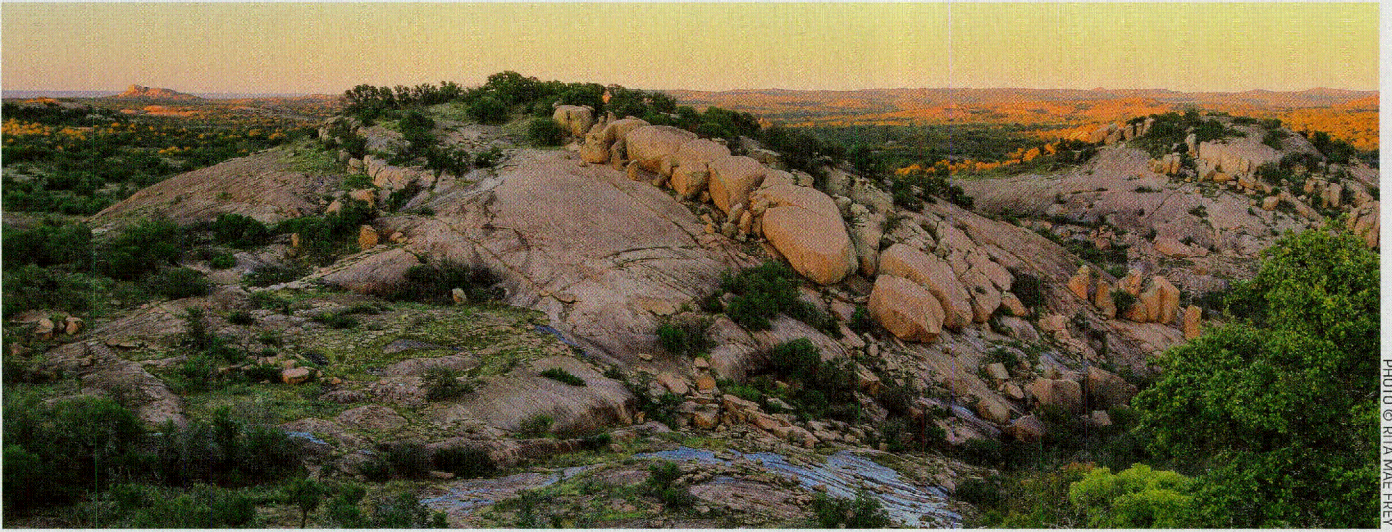


PHOTO © RITAMAREY

distance before opening up onto Enchanted Rock's Main Dome. The dome covers 640 acres and rises 425 feet to a high point 1,825 feet above sea level, making the climb equivalent to huffing up the stairs of a 30- or 40-story building. On the slope, though, you can follow your own route — straight up, back-and-forth switchbacks or circling. The summit itself is a large area worth spending some time exploring.

Whitener points out weathering pits, where rainwater collects in level spots and wears away the granite faster than the surrounding rock. When water remains for several weeks, pits become vernal pools, little worlds of their own with unique plant and animal residents.

Plants and animals provide a wealth of loose parts. Open oak woodlands contain trees such as post oaks, live oaks, blackjack oaks and Texas persimmons; shrubs such as agarita, whitebrush and prickly pear; and grasses such as bluestem, three-awn and grama. Mesquite grassland areas feature a variety of grasses, including Texas wintergrass, panicum and sandburrgrass, along with mesquite trees. Floodplain areas along Sandy Creek have a mix of elm, pecan, hackberry, black hickory, soapberry and

oak trees, along with shrubs such as agarita and buttonbush, plus grasses, sedges and herbs. Bluebonnets, Indian paintbrush, coreopsis, bladderpod, basin bellflower and other wildflowers bloom in all of these areas in the spring.

Tiny, translucent freshwater shrimp live in the vernal pools, laying eggs that remain when the water dries out and then hatch once rain falls. Other wildlife common in the park include rock and fox squirrels — one helped itself to a can of nuts we foolishly left on the campsite picnic table — armadillos, rabbits and white-tailed deer. During our wanderings among the rocks, we see several crevice spiny lizards, about 4 inches long, with a pattern nearly matching the granite. Abundant bird life here includes energetic canyon wrens and colorful painted buntings and summer tanagers.

Even the sky above the park contains loose parts. We climb the rock in late evening to watch a glorious sunset and stay long enough to see the stars emerge. Enchanted Rock has earned Dark Sky Park designation from the International Dark-Sky Association; Whitener and other park staff lead occasional star parties. All you need are your own two eyes, and perhaps binoculars, to enjoy the spectacle of billions of stars,

constellations and the Milky Way. No doubt many city kids see our beautiful galaxy for the first time here.

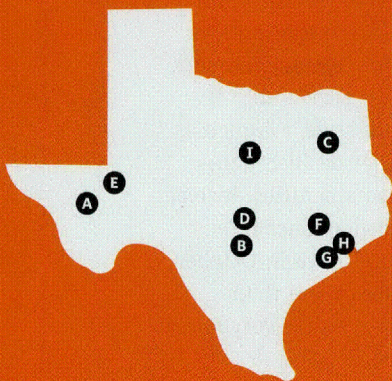
Signs of history make for more loose parts. Prehistoric residents of the area thousands of years ago ground or pounded food on rocks throughout the park, leaving depressions in the granite called bedrock mortars. Spanish explorers who arrived in the area in the 1700s and Germans and Americans following in the 1800s all left their marks; the park contains more than 400 protected archaeological sites, 120 of them designated as State Archaeological Landmarks. Rangers occasionally offer programs on archaeology.

The Nature Conservancy of Texas purchased this land from Charles Moss and deeded it to the state in 1978, rescuing this iconic landmark from having faces carved into it Mount Rushmore-style, a funicular to the top or other decidedly unnatural suggested amenities. Instead, it officially opened as Enchanted Rock State Natural Area in October 1978 and now sees more than 250,000 visitors a year. Everyone, it seems, enjoys loose parts. ★

Melissa Gaskill of Austin is writing all 10 cover stories for the Year of State Parks series.

NINE PARKS KIDS LOVE

One of my fondest childhood memories is camping as a family near Garner State Park on the Frio River. During my recent travels to all 95 state parks in Texas, I loved seeing other families making those same types of memories at our great parks here in the Lone Star State. In addition to our featured location this month, Enchanted Rock, here are some other state parks kids will adore.



By Dale Blasingame

A BALMORHEA STATE PARK ↓

The obvious draw here is Balmorhea's beautiful, spring-fed pool. On any summer day you'll see dozens of kids and families (and scuba divers) swimming in the crystal-clear waters, courtesy of San Solomon Springs. Kids can throw on goggles to get an underwater look at all the fish.

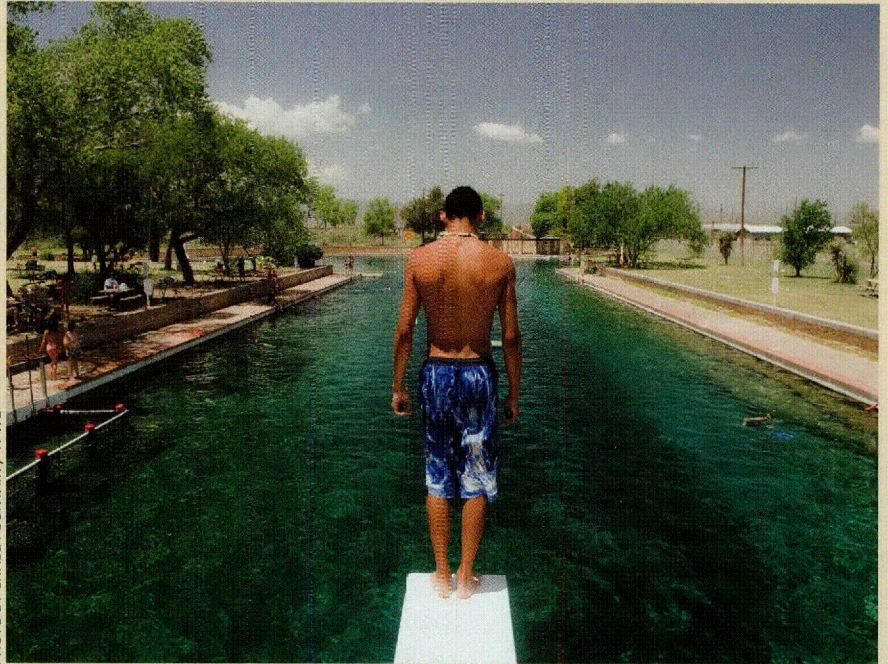


PHOTO BY CHASE FOUNTAIN / TPWD

B GUADALUPE RIVER STATE PARK

This park reminds me most of my favorite childhood days. You'll find a lot of kids swimming in the clear waters along this stretch of the Guadalupe River. The park also features the Children's Discovery Center, which offers kids of all ages the tools to learn more about nature.

C TYLER STATE PARK

If your child loves being in the water, Tyler State Park is the place to go. There's a spring-fed lake and beach area where kids love to swim, kayak and paddleboat. The Whispering Pines Nature Trail is an easy walk where kids can get a taste of hiking and history at the same time.

← **D LONGHORN CAVERN STATE PARK**

The 1.25-mile hike (round-trip) down into the cave is the perfect distance to keep your kids interested in the science and geology that lie beneath the ground. For more adventurous children, sign them up for the Wild Cave Tour so they can crawl around and get dirty.

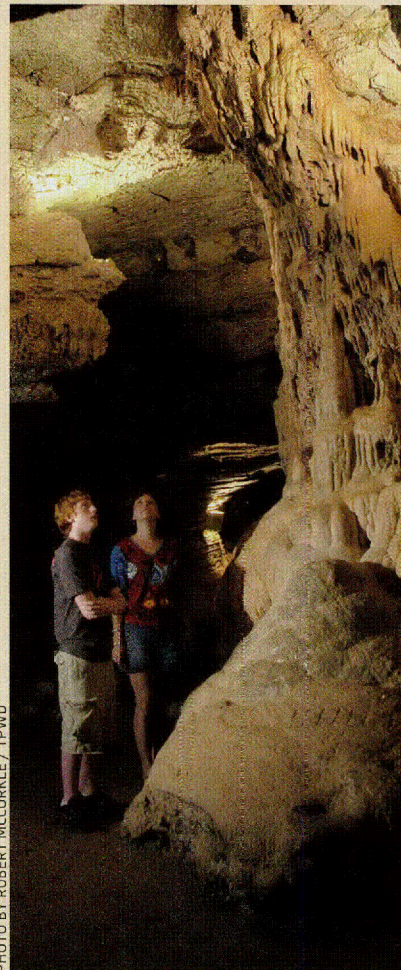


PHOTO BY ROBERT MCCORKLE / TPWD

E MONAHANS SANDHILLS STATE PARK →

This park is referred to as “a Texas-sized sandbox.” That should tell you all you need to know about whether kids will enjoy it. Rent a disk and let your kids surf down the sand dunes; some tower as high as 70 feet tall.



PHOTO BY BRYAN FRAZIER / TPWD

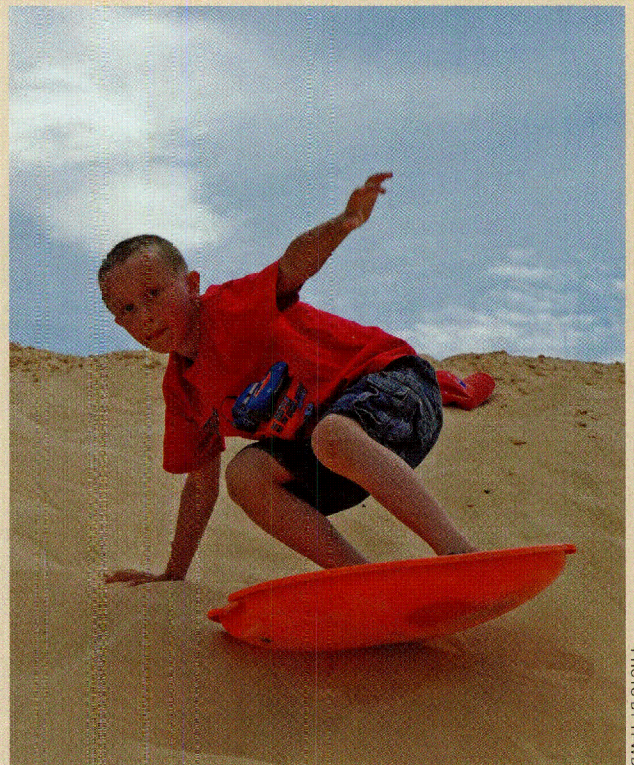


PHOTO BY TPWD

↑ F BARRINGTON LIVING HISTORY FARM

Here, children can get a look at what life in Texas was like 150 years ago. This working farm is connected to Washington-on-the-Brazos State Historic Site, and it allows kids to be part of the scene, interacting with the re-enactors and the animals.



PHOTO BY CHASE FOUNTAIN / TPWD

Ⓒ BRAZOS BEND STATE PARK

Children can learn about alligators while watching them from a safe distance at this park. Brazos Bend has plenty of great hiking and fishing opportunities as well. The Elm Lake day-use area is a fantastic spot for nature watching.



PHOTO © LAURENCE PARENT

← I DINOSAUR VALLEY STATE PARK

It's hard to visit Dinosaur Valley and not feel like a kid again. Gawk at the gargantuan dinosaur statues that greet you near the entrance of the park and then go check out dinosaur footprints in the Faluxy River. What kid wouldn't want to roam around where dinosaurs once lived?

↑ H SHELDON LAKE STATE PARK

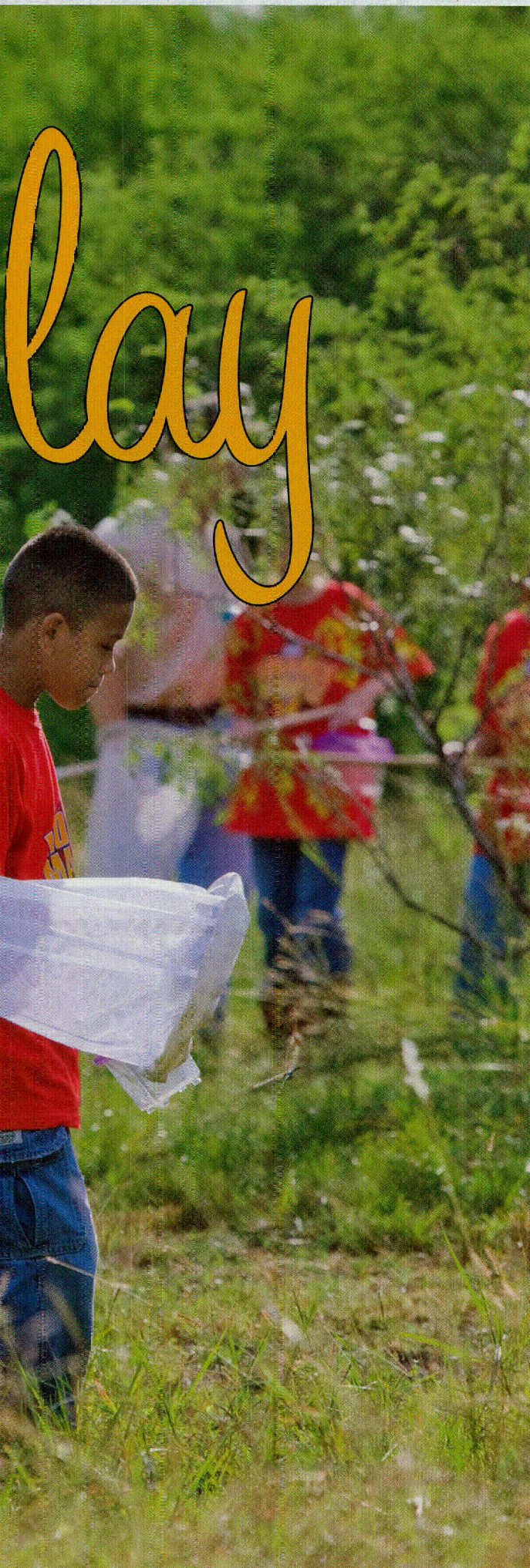
This park on the northeast side of Houston gives children the opportunity to fish and hike through pond areas that alligators, birds and butterflies call home. Sheldon Lake is also the first park to offer a mobile app game that helps kids learn about nature and the environment.

35 ways to get out and



**Want
healthier,
happier kids?
Take them
outside!**

BY JENNIFER BRISTOL



Remember playing hide-and-go-seek, building a fort in the woods or catching fireflies in a jar? Many of us have wonderful memories associated with playing outside as a kid. Today, all too often, children aren't getting enough time in nature. What will they remember when they think about their childhood?

Spending time in nature is great for making memories, but did you know that it is also good for a child's development? Research shows that kids who spend more time outside are healthier (both physically and mentally), are better problem solvers, are more creative, feel more self-reliant and have higher self-esteem. They will be the stewards of tomorrow, so lead them out of the house and help them discover why life is better outside.

Not sure where to start or what to do? Here are dozens of ways to play that are easy to do at home or at a neighborhood park, or on a grander adventure to a state or national park. These activities are fun for kids but even better when the entire family is engaged.

In addition to these suggestions, there are thousands of outdoor learning opportunities throughout the year at Texas state parks; find more ideas about nature activities near you at NatureRocksTexas.org.

A Few of Our Favorite Things

Night Sounds

Kids are always curious about what goes bump in the night. Set aside time to get outdoors at dusk or in the evening to listen for the soft hoot of an owl, the call of a coyote or the soothing sound of the chuck-will's-widow. Make notes about what you hear and discover what changes from month to month.

Under a Thinking Tree

All kids like to have a space that is special and just for them. Let kids find a special tree that is close to home that they can climb on, play under or just sit near to think, free from distractions. It might be fun to come up with a name for the tree or try to guess its age. Consider planting a tree, giving it a name and taking photos with it over time to see how the tree and child grow together.

The Stars at Night

"The stars at night are big and bright" ... or so the song goes. Captivate your senses on a moonless night by staring at the vastness of the sky in all its starlit beauty. Find a dark space in a park or at home to marvel at the stars and learn about the constellations. Better yet, head outside during one of the year's meteor showers to witness dozens of shooting stars. The Perseid shower peaks Aug. 12 every year, and other showers occur throughout the year. Several state parks and communities have been designated as International Dark Sky locations.

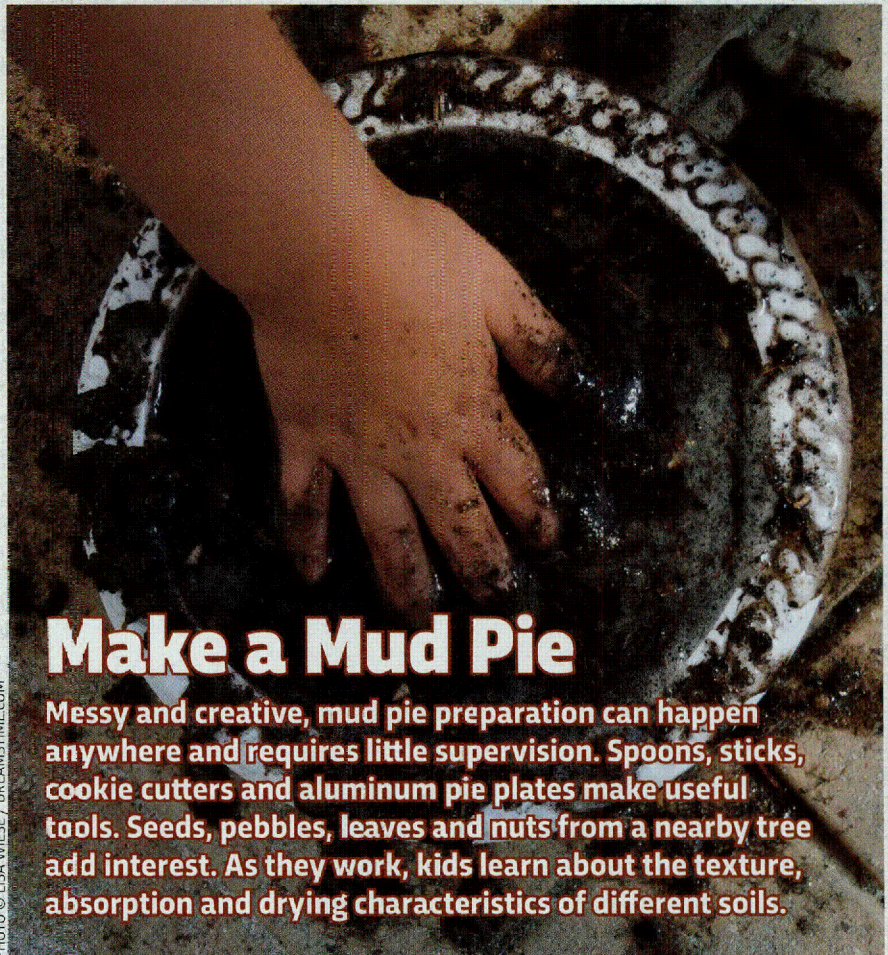


PHOTO © LISA WIESE / DREAMSTIME.COM

Make a Mud Pie

Messy and creative, mud pie preparation can happen anywhere and requires little supervision. Spoons, sticks, cookie cutters and aluminum pie plates make useful tools. Seeds, pebbles, leaves and nuts from a nearby tree add interest. As they work, kids learn about the texture, absorption and drying characteristics of different soils.

Finding Fireflies

Fireflies winking on and off in the soft air of a summer night have fascinated kids for generations. Did you know fireflies aren't really flies? Catch (and release) one in a jar, and you can see it's really a beetle. Fireflies prefer dark spaces, so turn off the yard lights and watch the show. Encourage fireflies to live in your yard by not applying pesticides, letting the lawn grow a little longer and turning off exterior lights.

Using Technology to Explore

Unplugging from the distractions of technology is great, but it's not always an option. There are so many apps now that can help kids explore with confidence and understand the natural world they are encountering. There are apps to identify birds, locate geocaches, create maps, identify trees or name the constellations at night.

Let's Be Healthy

Research shows what many parents have long known, that children who learn and play in nature are healthier both mentally and physically. Active, unstructured play outdoors helps build a child's physical strength and also helps children build social and emotional skills such as problem solving and self-esteem.

Children today are spending seven to 11 hours per day sitting with media and only minutes per day playing outdoors. With that sedentary lifestyle we've found a rise in childhood obesity, depression, near-sightedness and ADHD. The good news is this is a situation that everyone can improve by taking the kids in their life outside. Families who make a plan to be active in nature are helping their children build skills that will contribute to a healthier life.

"I can see a dramatic difference in my kids on the days they spend outside versus a day spent inside playing video games. Their behavior, attitudes and energy levels are better. And they sleep better when they have been outside, too!" says parent Holly Thoden.

Let's Play

Giving children the time and space to play is both fun and healthy. Find a place in your community where kids can run, spin around, jump up and down or come up with their own games. Make sure things are safe and let the kids' imaginations do the rest.

Ride Like the Wind

The joy of riding a bike never gets old. Plan to have a "Wheels Party" in the neighborhood where kids can bike, skate or ride anything with wheels. Make bike or skateboard relay teams and have races. Or plan a grander bike journey at a state or local park.

Flashlight Freeze Tag

Remember freeze tag? This variation of the classic game allows kids to have an outdoor game that can be played at night. The person who is "it" has the flashlight and freezes others when he or she shines the light on them.

Take a Nature Walk

Walking in nature doesn't have to be a long, strenuous journey. For kids, a short walk with active conversation about the natural world around them is enough to grab their attention. Any walk can be turned into a nature walk when you stop to think about what you smell, hear, see or feel. Having intentional stops every 10 minutes is a great way to turn exercise time into exploration time.

Picnicking

Outdoor cooking often involves hamburgers and hot dogs. Enjoy healthy options with seasonally fresh foods to complement the healthy choice of being in the outdoors. Engage kids in the process of cooking on a grill or over an open fire. Picnicking is a perfect way to bring generations together to make outdoor time become family time.



Go Paddling

Gliding along a lake or river is a great way to experience nature and get some exercise. With kayaking and canoeing, kids develop a lifelong outdoor skill and gain the opportunity to see parts of nature that cannot be observed from land. Texas has designated paddling trails that meander through various eco-regions and unique parts of the state.

PHOTO BY CHASE FOUNTAIN / 71PMO

Problem Solving & Cooperation

Did you know a simple game of hide-and-go-seek can help develop problem-solving skills? Playing a game like this in the outdoors allows children to make observations, look for patterns and listen to discover where their friends and family might be hiding. Nature presents challenges for children; let kids use their own ideas to solve them. Such challenges can also inspire cooperation — kids may try solving those problems with other kids before engaging their parents, teachers or play leaders.

"I watched my daughter, who is much younger than her brother, figure out how she could climb up on a log with her brother the other day," says parent Susan Temple. "She wasn't able to jump up, so she looked around for something she could stand on. She moved a rock into place, but still couldn't reach the top. One of the other children saw her and started to pile more rocks until she had a big enough platform and could finally climb onto the log."

Play in the Rain

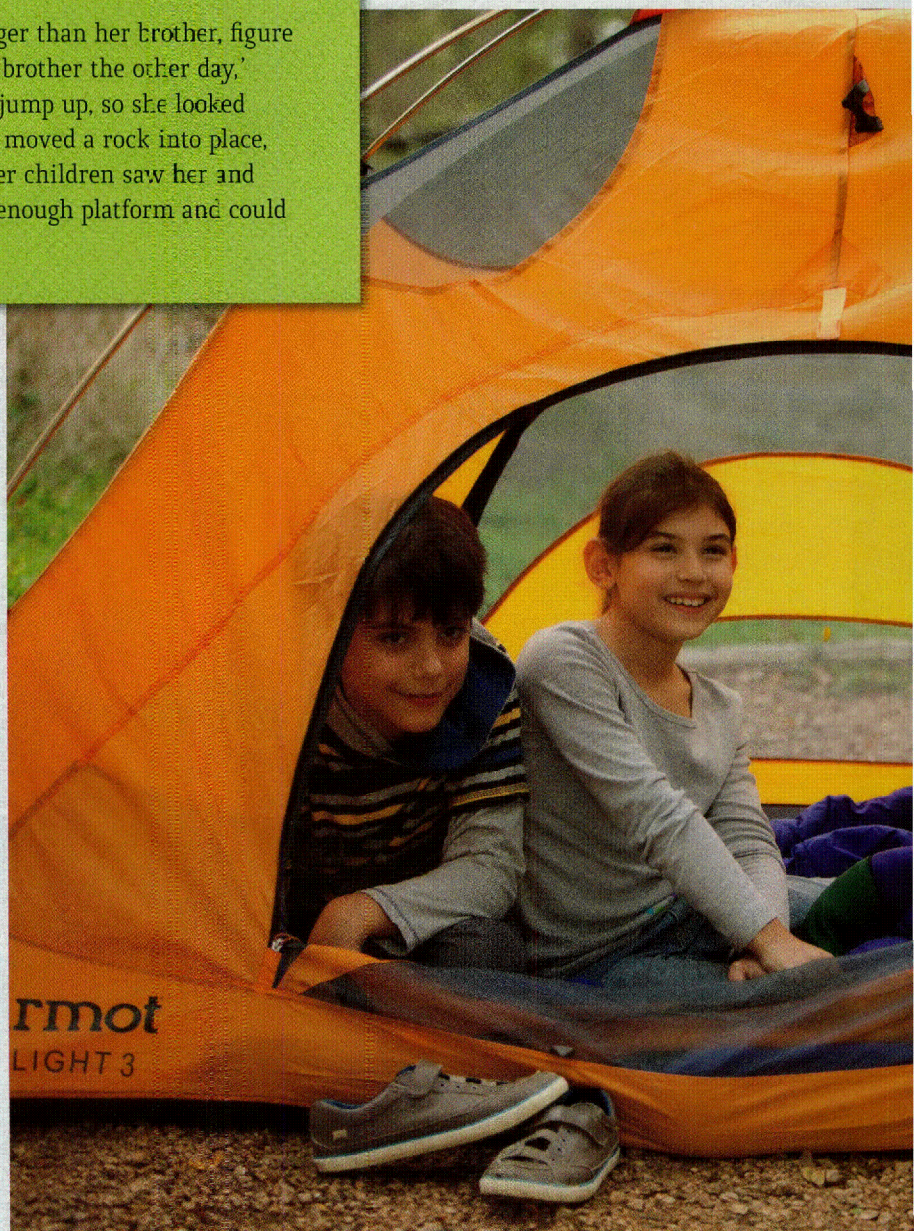
Next time there is a warm, gentle rain out, why not let the kids run and play in it? Smell the fresh scent of rain-washed air. Listen to drops falling on grass and tree canopies. Watch the drops gather into streams and have stick boat races with friends. Jump in a puddle! Wear boots, carry an umbrella or just decide to get wet. (This works best in a gentle, steady rain. If you hear thunder, get inside or under cover.)

Have a Scavenger Hunt

You can create a scavenger hunt just about anywhere. Take a walk in your neighborhood or at a park to pick the items you want kids to discover. Make up a list of clues, set a time limit and let the kids work together in teams or individually to complete the scavenger hunt tasks. You can have them check things off a list or record their discoveries by taking a photo of their finds. (Consider ages when writing up the clues.)

Plan a Trip

What shoes do we pack? How much water should we bring? Where are we going? These are all great questions to ask and answer by planning a trip. Give the kids a map or computer to decide where to go and consider how long it would take to journey there. Let them decide if their trip will involve swimming, fishing, hiking, caving or simply finding the best place to play. Work together to plan how much water, food and other gear will be needed. Planning a trip is half the fun!



Investigate Micro-Worlds

Adults love grand vistas and big adventures, but little ones need things on a smaller scale. Look into a puddle of water after a summer rain and you might be surprised by how much life is living in and around the puddle. Find a fallen log or old snag in the woods and see how many types of critters are using it for shelter or food or as a lookout. Consider all the life that lives below the height of your ankle as you mosey along a trail with a child.

Make an Adventure Map

Children view the world differently than adults. Have kids show you how they see a neighborhood or local park by creating an adventure map of the area. Walk the area at least one time, then let them draw a map. They can mark places where they might stop to throw rocks into a creek, note a tree that looks fun to climb, or plot where a bird's nest is located that they want to visit again once the eggs hatch.



PHOTO © KUHLEN PHOTOGRAPHY



PHOTO BY CHASE EDUNJIAN / TPWD

Build a Fort

Children love to have a space that they have created and they can call their own. Building a fort in the woods or in a yard is something fun for many ages. Children can make a lean-to with sticks and branches, string a tarp between trees or build something more elaborate with lumber and nails. Whichever method they choose, the important thing to remember is to let the kids use their imagination and sense of cooperation to build their special place.

Go Camping

Sleeping in a tent, building a campfire and listening to the soft sounds of night are all part of the pleasure of camping. Texas has thousands of campgrounds both public and private, but sometimes starting slow with a backyard campout can be the ticket to introducing kids to the outdoors. Setting up a campsite takes teamwork — the entire family can pitch in.

Let's Get Creative

Have you ever asked children to tell you what they see, think, smell or feel in a natural setting? Are you amazed at how creative their answers can be? Nature has long been the source of inspiration for ideas, works of art, inventions, literature and music. When kids come up with their own games they are fostering their imaginations.

Creativity is a strong component of critical thinking and important in a child's development. More importantly, when kids are allowed to explore and use their imagination, it's really fun for them and the accompanying adults.

"I can see my boys' imaginations come to life outside; critical thinking and observation skills are nurtured, and creativity and independence are born," says parent Jenny Sander.

Make a Video

Videos can be a fun way to capture and share an outdoor adventure. Be spontaneous and edit together what happened that day. Or go bigger by writing a script, drawing storyboards and using nature as the backdrop for the story. Let your imagination run free. Editing is easy with iMovie and other video editing software.

Write Poetry

So many of the poems and stories that have stood the test of time were inspired by nature. Having a child or group of children write about what they are seeing, hearing or feeling while on a nature adventure is a good way to slow down and reflect. Find interesting subjects in nature and write simple haikus or longer, theme-based poems.

Build a Boat

Making a boat doesn't have to be elaborate. Find some scraps of lumber, an old T-shirt for a sail, a few sticks for a mast, some string and a few nails. Use one piece of wood for the hull of the boat, place a wood block in the center, nail it down, tie or nail the stick to the block, make a cross with the sticks to form the mast and attach the sail. Tie the string to the end of it for a tether. Take the boats to a creek, pond or lake to have boat races or just play.

Build a Sand Castle

You don't have to be on the beach to build a sand castle. All you need is fine sand, water and your imagination. Sand sculpting can be a family project, with tasks appropriate to every age level. Bring shovels, spoons or cups for digging, buckets for mixing, and sticks, shells or rocks for decorating. Don't have a sandbox? Just lay down a piece of tarp to dump the sand onto and use rocks or lumber for the sides.



PHOTO © TODD J. STEELE

Art in Nature

From Walt Disney to Monet, artists near and far have looked to nature to inspire them. Art can be a watercolor painting or a simple arrangement of rocks, sticks and leaves. Another creative art project is to let kids photograph what they see in nature — make a collage from the images or put them into a journal. Older kids might consider making a short video. You can also create something useful like a birdhouse and give it an artful flair by letting the young ones paint it and apply sticks, feathers, string or other decorations for a one-of-a-kind project.

Go Birding

Texas has some of the best birding in the world. It is a great way for kids to observe wildlife, learn about migration and habitats and even become citizen scientists when they log their observations into Texas Nature Trackers or eBird. Setting out a feeder or birdbath will attract birds to a fixed location that makes it easier for families to see the variety of birds in their community.

Learn more about birding on Page 64



Volunteer

Volunteering is a perfect way for kids to experience outdoor programs such as planting trees, cleaning up a park, caring for wildlife and learning lifelong lessons about giving back. Older youth can contribute through community service projects such as planting wildscapes at school campuses or removing invasive plants at a local park. Volunteer projects are also a great place for families to meet other like-minded kids and adults.

Observe Night Life

Have you ever watched children's eyes light up when they see a wild animal? The more children know about wildlife, the more apt they are to care for it as they grow up. Seeing a wild animal during the day is exciting, but seeing an animal at night can be thrilling. Kids can see nocturnal animals while camping or taking a family walk in the moonlight. Consider putting up a wildlife camera in a safe location and see what passes by in the night.



Plant a Butterfly Garden

Butterflies like the monarch need our help to survive. Kids can help by planting a butterfly garden at their school, at a public park or even at home. Even just a few native plants can attract butterflies and give kids the opportunity to see them up close and know they have helped provide food for them.

PHOTOS LEFT TO RIGHT: © JOHANN SCHUMACHER, © KUILIKEN PHOTOGRAPHY

Let's Be Stewards

When children build a relationship with nature, they tend to be more inclined to care about their natural world as adults. Learning about food webs, water systems, weather and migration patterns of wildlife all help kids understand the relationship between themselves and the world around them.

"I've seen what a difference it makes in children's lives when they've had the chance to help nature and their community," says Nancy Herron of the Texas Parks and Wildlife Department. "It's a life-changer!"

Stewardship can be as simple as sharing a love of the outdoors with another person, or something grander like volunteering. At each touch point, kids start to build their own connection and start to care about the things that spark their interest.

Splash in a Creek

A shallow creek or beach can entertain a child for hours. Splashing around, making dams, throwing rocks or having stick races are activities that can help pass the long, hot summer days. Adults are encouraged to get their feet wet as well. Each connection, large and small, builds the relationship between child and nature.

Let's Be Independent

Have you ever watched children's faces light up when they catch their first fish, or reap the first harvest from something they planted? In that moment they have done something so much more than catch a fish — they have been empowered with a skill that will help them be self-reliant.

"I enjoy watching my girls try different methods to catch a fish," says parent Caleb Harris. "Sometimes what they try doesn't always work, so I encourage them to try another way. We laugh a lot about some of the silly things we try. Telling their friends how they caught the fish is almost as fun for them as sharing the fact they actually caught one."

A great way to engage teens and help them master outdoor skills is to have them share their knowledge with younger kids. The thoughtful interaction that can occur is one more step in the journey to self-reliance.

PHOTO BY CHASE FOUNTAIN / TPWD



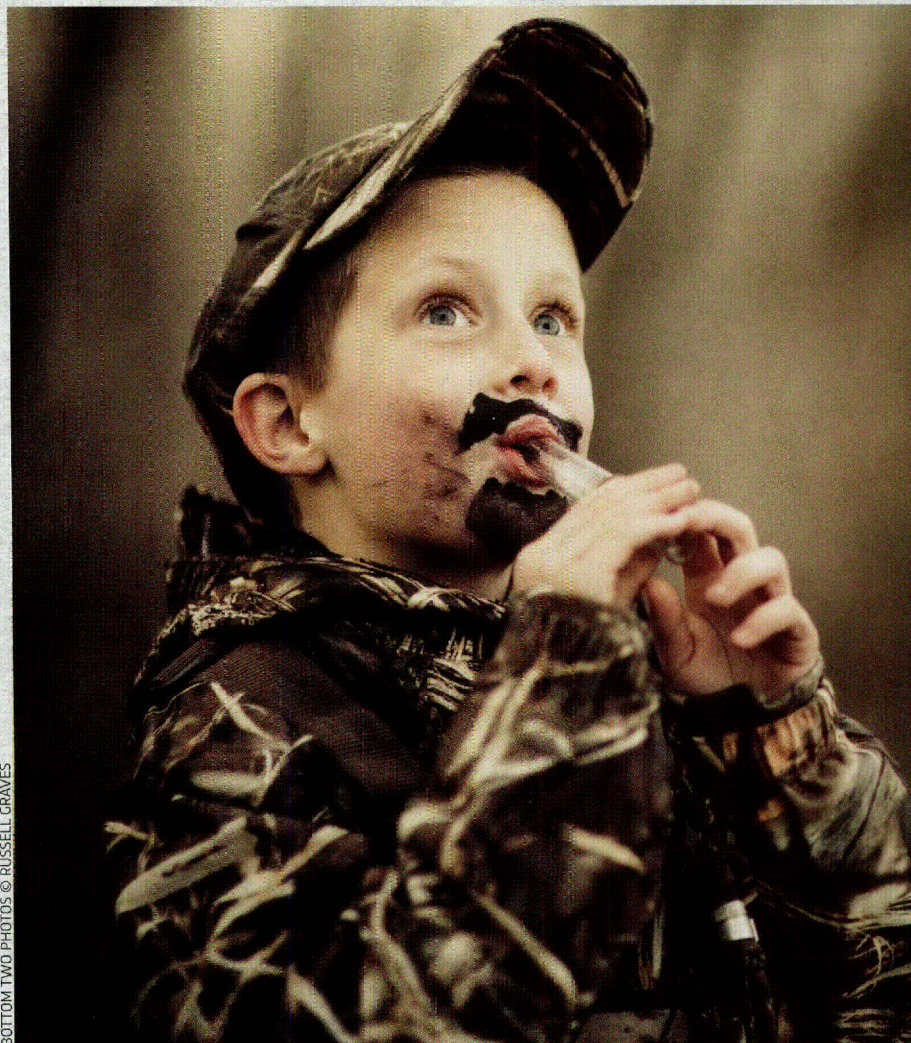
Discover Animal Tracks

Finding tracks in soft soil or mud is like finding a clue. Tracks can tell us who else might use the trail, enjoy a drink at the creek or pass through the campground at night. Have the kids compare the tracks to their own hands or feet to get a sense of what size the animal or bird might be. Follow the tracks to see where they lead. Have kids guess what creature might have made them, then look up the tracks in a book or online to verify if they guessed correctly.

Find Native Food Growing Wild

Mustang grapes, dewberries, pecans and other edible fruits and nuts grow wild in Texas. Pick them by the roadside or on private land, with the owner's permission. Gather pecans on a riverbank, or visit a pick-your-own peach or apple orchard. Involve the whole family in making jelly, pie or ice cream topping. (Note: Children should never pick and eat anything without adult supervision. Some wild things are poisonous.)

BOTTOM TWO PHOTOS © RUSSELL GRAVES





Go Geocaching

Who says there isn't hidden treasure out there? Geocaching brings together technology and the great outdoors in a hunt for hidden treasure. There are geocaches in almost every neighborhood or local and state parks. Fire up the GPS or just use your smartphone and plug into nature by using technology.

Build a Campfire

Campfires light up the night, provide warmth and offer a special space to share stories. Some fire builders prefer the pyramid method, while others make a log cabin with the wood. Either way, kids can contribute to building the fire or being the special "fire lighter." The flicker of the flame will entertain kids of all ages well into the night. Always check for burn-ban restrictions during hot, dry conditions. Don't forget the marshmallows.

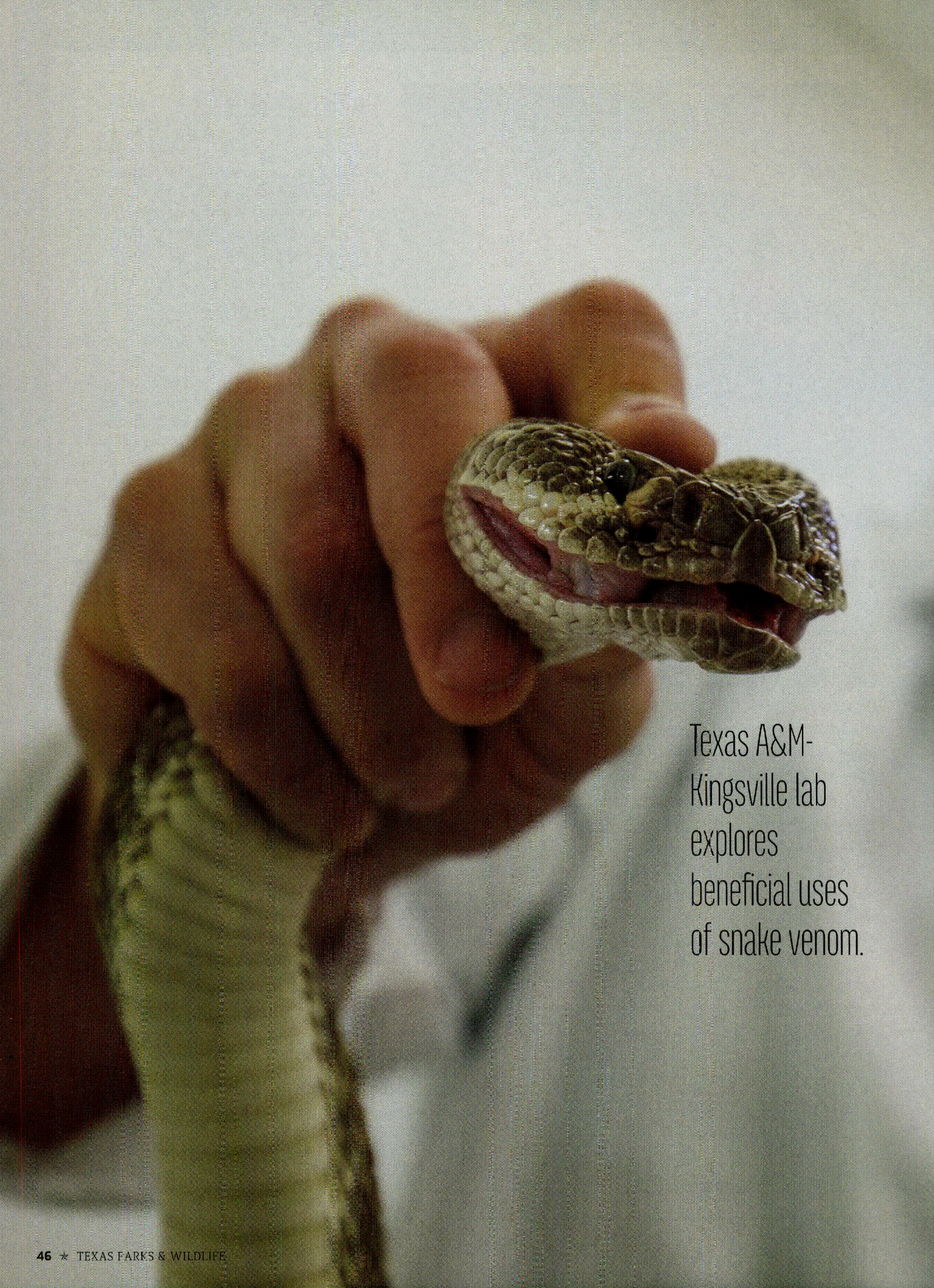
Learn to Hunt

Texas has a long tradition of hunting game such as white-tailed deer, turkey or quail. Kids who learn to hunt safely and with positive ethics can engage in an outdoor pursuit that can last a lifetime. Hunting teaches patience and respect for the animal being harvested. It's a skill that gives adolescents the confidence to provide for themselves. Hunting also requires kids to have self-discipline and focus, which are important developmental functions for teens. Be sure to enroll them in a hunting education course.

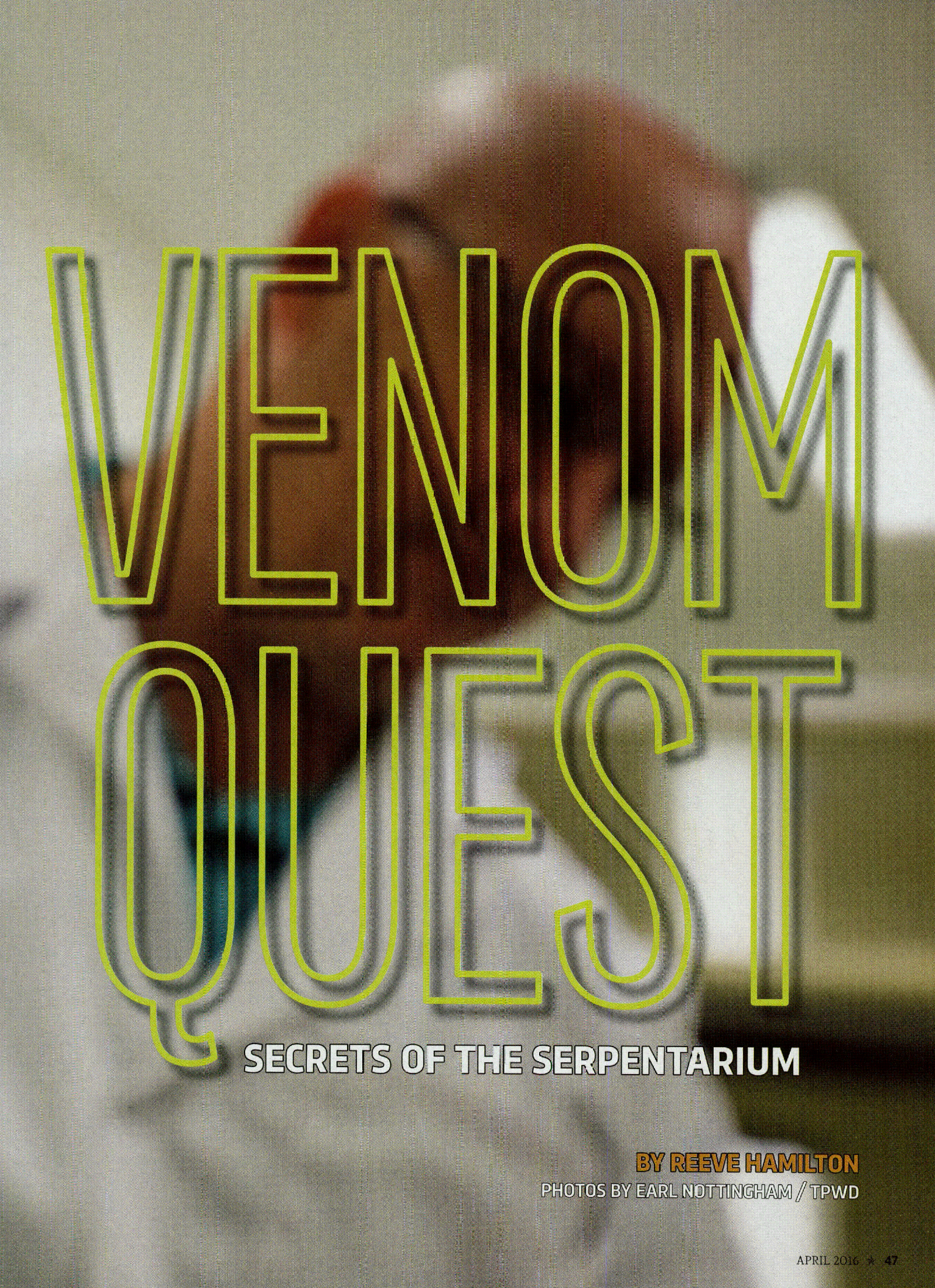


Go Fish

Catch and release or catch to eat. When children learn to fish they have a lifelong skill that provides them with enjoyment and a food source. When taking a kid to fish for the first time, consider going somewhere that has been freshly stocked or has plenty of fish. Reeling in a fish on the first outing is a surefire way to hook a child for life on the simple pleasure of fishing.



Texas A&M-
Kingsville lab
explores
beneficial uses
of snake venom.



VENOM QUEST

SECRETS OF THE SERPENTARIUM

BY REEVE HAMILTON

PHOTOS BY EARL NOTTINGHAM / TPWD



After putting up a strong fight amid a patch of sunflowers, a large western diamondback rattlesnake was caught in a residential neighborhood in the pre-dawn hours of an otherwise ordinary day last spring. It happened to be May 4 (as in “May the Fourth be with you”), a day celebrated annually by *Star Wars* fans and pun enthusiasts. So when the snake was brought to its new home, a fairly nondescript beige-colored brick government building in Kingsville, the staff gave him a new name: Luke.

The choice was more apt than those who made it may have realized. In the beginning of the original *Star Wars* trilogy, Luke Skywalker is going about his tedious, chore-filled life as a farmhand until fate unexpectedly intervenes. Soon, he finds himself traveling to places he never imagined as a central player in an ever-intensifying intergalactic battle between good and evil. To get through it, he must learn to properly channel his innate connection to “the Force,” a source of power that his enemies can also use for their own dark purposes.

On that fateful May morning, like

his namesake, Luke the rattlesnake was abruptly yanked — in this case, by a long stick — into a new environment, one that would require him to harness his natural venom-producing abilities. While certainly an effective means of defense and killing prey, Luke’s venom, from here on out, would be used to save lives.

Luke is now one of roughly 450 venomous snakes that call the John C. Perez Serpentarium home. He’s unique in that he has a pet name to go along with his nine-digit identification number. His fellow tenants are an international bunch, including species typically found



on the other side of the globe, like the red spitting cobra or the Gaboon viper. The serpentarium is part of Texas A&M University-Kingsville's National Natural Toxins Research Center. Through its own research, and through the venom it provides to other researchers throughout the country, the center has been a critical player in efforts to find productive uses for the toxins found in snake venom.

Molecules in venom that prevent blood from clotting — with the aim of getting the snake's prey to bleed to death — are now used in drugs aimed at treating strokes, heart attacks and high blood pressure in humans. Molecules derived from snake venom are used to fight cancer.

Snakes have different ways of reaching the center. Some, like Luke, are captured and given to the center. Others have been donated by zoos or law enforcement. A fire department in Tucson, Ariz., holds onto snakes that firefighters have captured from houses until someone from the NNTRC can come pick them up.

"A lot of people are willing to help," says Elda Sanchez, the executive co-director of the center.

Sanchez says the NNTRC does not accept snakes or venom collected from rattlesnake roundups or specimens "gathered inhumanely, including through gassing."

Other snakes have been procured on official snake hunts. Growing up, Sanchez could not have known how much of her career would be

spent inching along remote West Texas roads in a truck on cool nights hoping to spot snakes that had crawled onto the asphalt to soak up the radiating warmth. Typically such an excursion might yield about three snakes, she said, though one time they got 30 in one night.

It has become common practice for venom labs to maintain detailed records on each specimen, including the capture location (if it's available). Venom components within a species can vary greatly from one region to the next. If researchers find a useful venom component in a certain sample, they can return to that exact snake in the lab for more venom. By knowing where the snake was captured, researchers could even return to the original population to gather other specimens for further research.

The snakes at the serpentarium are serving a noble purpose: providing high-quality venom to researchers and helping reduce the impact of snakebites. In the U.S., between 7,000 and 8,000 individuals are bitten by venomous snakes each year, and the number of fatalities is in single digits. By contrast, many more Americans die from bee, wasp and hornet stings (58) and car crashes (33,000) each year. Elsewhere in the world, the odds of dying can be much higher, and estimates put the annual number of global snakebite fatalities at more than 100,000 each year.

Snakebites must be treated with antivenom specific to the snake that

From left: Texas A&M-Kingsville's serpentarium is named after founding director John C. Perez. Curator Mark Hockmuller oversees the collection of about 450 venomous snakes from around the world, including rattlesnakes and cobras.

did the biting, and some antivenoms are easier to come by than others. In 2014, the Department of Defense announced a desire for antivenom that could counteract a bite by any snake and could be administered by nonphysicians, which would improve the odds for troops on the ground in exotic and remote locations, far from medical facilities. Current antivenoms are created using antibodies from other animals and can sometimes cause allergic reactions in people.

In collaboration with a Houston-based company called AM Biotech, the NNTRC is in the early phases of testing a synthetic antivenom that would counteract all snakebites and diminish the risk of reaction. Like many drug development efforts, the end of the process is still decades away — and it will require a significant amount of venom from the snakes at the serpentarium.

While it may not look exceptional from the outside, the 4,000-square-foot serpentarium is in many ways unlike anywhere else in the state. To my surprise, during a visit in December, I found that standing in the center of the building can be incredibly soothing — if your eyes are closed. It's like standing



underneath a small waterfall, or in a circle of slowly tilting rain sticks. Of course, if you open your eyes, you'll see what some might consider the stuff of nightmares: wall-to-wall and floor-to-ceiling rattlesnakes.

"You never want to get too comfortable," says Mark Hockmuller,

the serpentarium curator who shows me around. His responsibilities include extracting venom from between 20 and 30 snakes each day. Most of the snakes behave predictably when their time for extraction comes, though he said some of the more exotic snakes — including a monocled cobra that he is still getting used to — have a slightly longer reach and can be a bit trickier. But Hockmuller takes a calm, almost clinical approach. Unlike most people in his line of work, he says, he has never been bitten.

From left: Mark Hockmuller handles a rattlesnake as he prepares to extract its venom at the John C. Perez Serpentarium in Kingsville. He extracts venom from 20 to 30 snakes a day, and scientists use the venom in medical research.

"Still, if I saw one of them outside out of context," he says of the snakes, "I'd probably jump just like everyone else."

Unless they are involved in venom research or happen to have visited on a school field trip, most Texans are probably unaware of the snake-filled building in Kingsville.

"It really is a hidden gem," says Jacob Galan, who grew up in the area. "I didn't even know it was in my backyard."

We were talking on the phone as he walked to his lab in Boston, Mass., one of several places he might never have lived were it not for his getting involved in the NNTRC as an undergraduate. He was not the first — nor will he be the last — to realize that the center can change lives in other ways.

"One of the things we pride ourselves on is training students, especially undergraduates," says Sanchez. "If you go to a larger university, you're not going to see many undergraduates in very sophisticated labs doing research the way you are here."

Sanchez says that anywhere from three to eight students are working at the center and are involved in publications each year. Galan was among them at one point. He followed up bachelor's and master's degrees at Texas A&M-Kingsville with a Ph.D. at Purdue University and a postdoctoral fellowship at the University of Montreal. Now he is a research fellow at Massachusetts General Hospital.

"Anyone interested in pursuing science should check it out," he says of the center. "It provides opportunities for students, especially from low socio-economic backgrounds, to grow and become confident scientifically. I am extremely grateful."

Sanchez's own story is not that different.

"I'm from South Texas," she says. "Our experience was very limited. I never had any idea what research was, what researchers did or that there was a career for that." She



enrolled at what is now called Texas A&M-Kingsville in 1990 expecting to become a science teacher. After earning her bachelor's and master's degrees there, she received a Ph.D. from the Universidad Central de Venezuela, all the while staying involved in what is now the NNTRC. Her course shifted dramatically as an undergraduate when she was asked to help with some research being conducted by a biology professor named John C. Perez, the center's founding director.

Perez's interest in venom got started in 1976 because of a gray wood rat. A student working in one of Perez's labs had added the rodent to the dinner menu for one of the rattlesnakes under their care. It turned out to undoubtedly be one of the worst dining experiences in the snake's life.

"They would throw it in the cage, the snake would strike, but the wood rat just wouldn't die," Sanchez says. Sanchez was just a girl then, unaware of the incident and the effect it would have on her life, but

the story is one she has since told countless times.

"There was a possibility that the snake was not injecting venom, or maybe the venom was bad," she says. "But they tested it against white mice, and they died immediately. So, the hypothesis was that the wood rat was resistant to snake venom."

Perez and his team began gathering up and testing other local fauna. It turned out that other animals, including opossums, hedgehogs and Mexican ground squirrels, were also immune. They began to dig further, embarking on what is now a four-decades-long inquiry into the properties of venom. When Sanchez arrived as an undergraduate, the center had about 50 snakes that were kept in a portion of an abandoned dormitory behind the campus police department. Over the course of her involvement, Sanchez has watched the collection grow to nine times that size. They got a significant jumpstart in the mid-1990s when she and Perez successfully applied

for two research infrastructure grants that allowed them to expand their snake collection and fund more snake hunting trips.

In 2000, the Texas A&M University System Board of Regents officially designated it the Natural Toxins Research Center. In 2008, the word "national" was added following the approval of a federal grant, which has since been renewed twice, establishing it as the only federally funded viper resource center in the country.

Though she did not start out as a snake enthusiast, Sanchez says she has developed an appreciation for the reptiles.

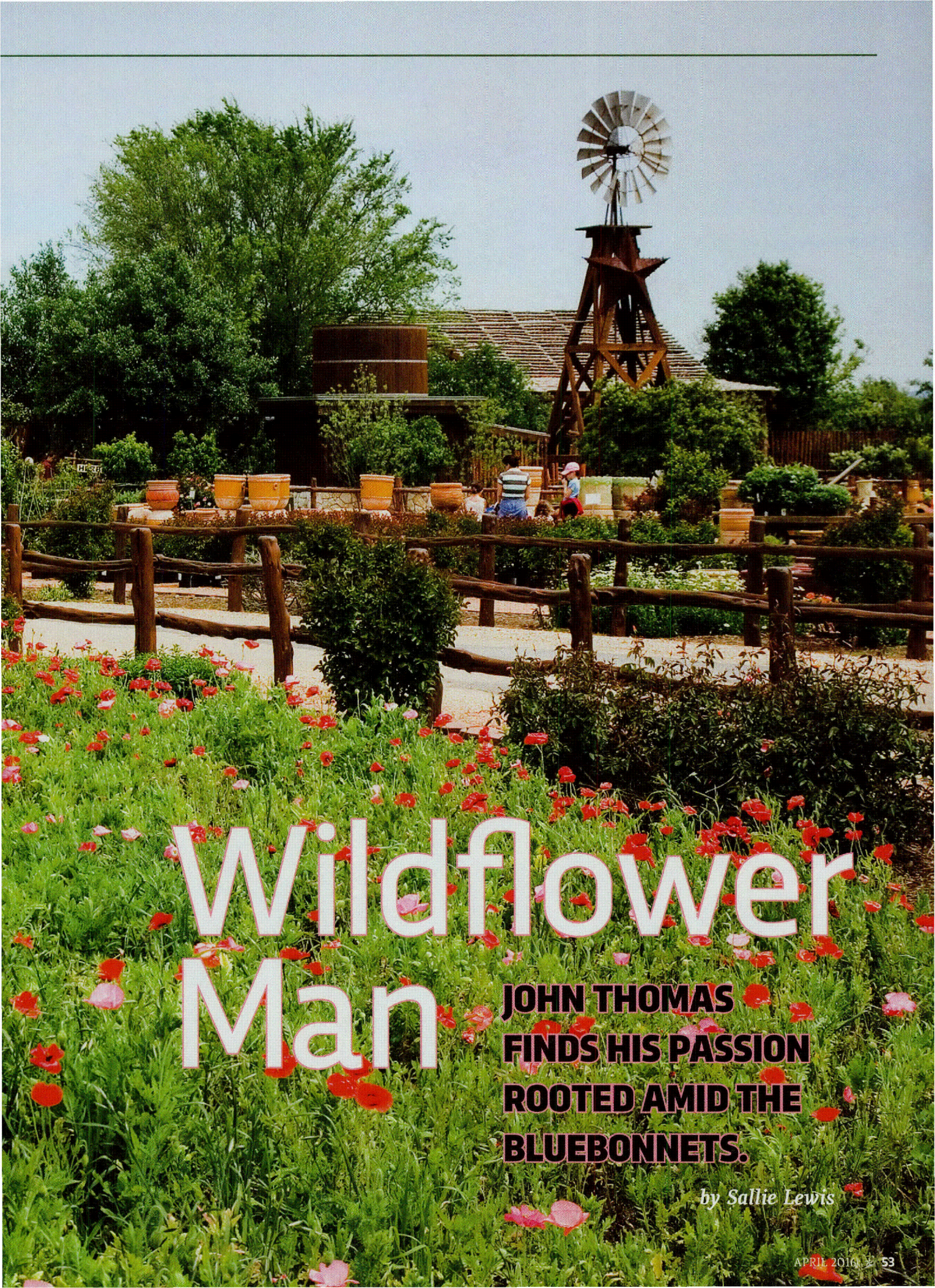
"I have a fear of them, too," she says. "The last thing you want to do is let your guard down and get bitten. But, whenever I associate with them in any way, there is always respect." ★

Reeve Hamilton, formerly of the Texas Tribune, is executive director of media relations for the Texas A&M University System.



SALMIAS

PHOTO © KATHY ADAMS CLARK / KAC PRODUCTIONS



Wildflower Man

**JOHN THOMAS
FINDS HIS PASSION
ROOTED AMID THE
BLUEBONNETS.**

by Sallie Lewis



PHOTO BY CHASE FOUNTAIN / TPWD

John Thomas (opposite page) oversees multitudes of wildflowers at his Wildseed Farms outside Fredericksburg.

EACH SPRING, Central Texas explodes into a riot of color as bluebonnets, Indian paintbrushes, coreopsis, evening primrose, firewheels, Indian blanket, winecups and more burst into bloom with the start of wildflower season. Spring getaways are planned to include these visions of wonder; weekend outings include detours through the most scenic routes, including one spectacular spot that offers endless fields of vibrant beauty.

Just seven miles east of Fredericksburg on U.S. Highway 290, John R. Thomas nurtures this astounding display of eye candy at the nation's largest working wildflower farm, Wildseed Farms.

Born to a family of farmers and ranchers, Thomas grew up learning to work on the land. At a recent meeting he was a fitting portrait of grit and dedication, dressed in dusty work boots and faded blue jeans, skin bronzed by the sun, a cut on his hand held together with wiry blue stitches.

In the early 1980s, prior to Wildseed's conception, Thomas owned a sideline turf seeding business. During that time, he began to notice a trend on the highways and roadsides where he worked.

"What interested me were the amounts of people pulled over on the side of the road," he says of the crowds marveling at the flowers. "Texas has the largest flower show on earth in the spring. People come from far and wide to see vistas of color."

Recognizing that untapped market, he began experimenting with wildflowers like the famed bluebonnet, collecting seed and harvesting it on his family's farm in Eagle Lake, near Columbus.

Throughout the process, Thomas discovered a personal passion that would eventually lead him to his work today.

"I was interested in wildflowers because no one else was doing it," he says. "We took it to a different level and made a business out of it."

It's been more than 30 years since this experiment first began. Today, Wildseed Farms encompasses more than 200 acres at its corporate office in Fredericksburg with an additional 600 acres in Eagle Lake. Since its founding, the business has grown considerably, introducing retail operations, wine and beer tasting venues and a nursery. Want to grow your own? There's a bulk seed division with a mail-order catalog so the fruits of Wildseed can be shared with the masses.

Ever the savvy businessman, Thomas recognized that by partnering with farms in places like Oregon and the Netherlands, he could create regional mixes and blends reminiscent of Texas wildflowers. With these varieties, people around the world could then plant and enjoy them in their unique home climates.

One of the most common

misconceptions regarding Texas wildflowers is the nature of their cycle. People worldwide celebrate spring in Texas for the miraculous color transformation that ensues. Thomas, with his tremendous farming tutelage, knows that the flowering fields and roadsides awash in periwinkle, pink and coral red are the result of a meticulous, scientific progression.

The wildflowers' journey actually begins in the fall, when seeds are planted. With fall and winter rains, the seeds begin to grow and germinate, eventually establishing a strong root system. In March, April and May, the flowers bloom and blaze in shades that defy the imagination. These blooms produce seeds, and after the blooms fall, the seeds mature.

This is when the real work begins for Thomas and his team. Harvesting takes place from June to August, and together, they scalp and dry the seeds with the help of many tools developed on the farm, such as state-of-the-art seed cleaning equipment.

"The growing is the easy part," Thomas says, laughing. "Processing the seed is the hard part."

Thomas doesn't have to give me a

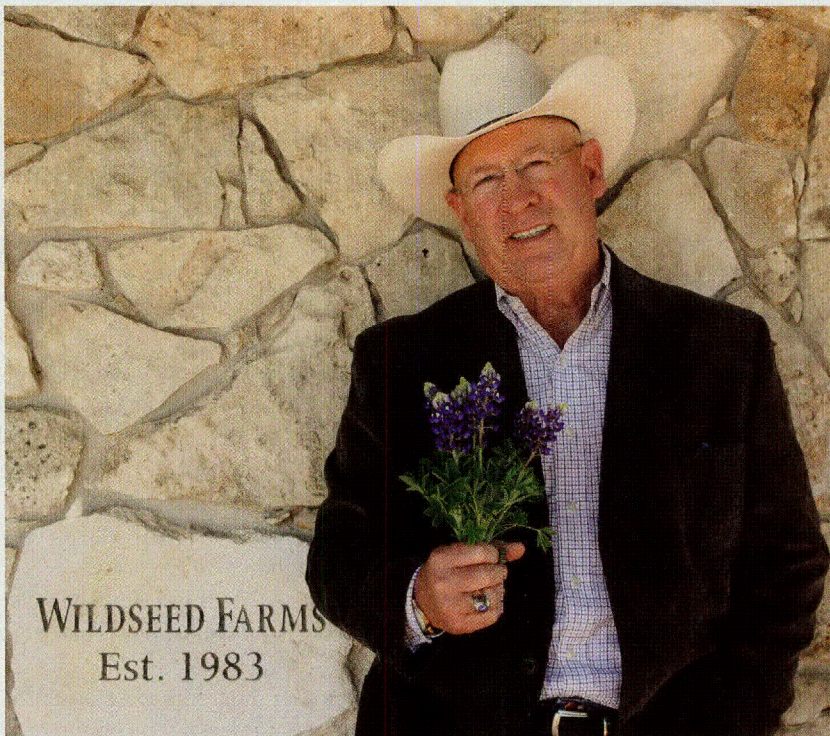


PHOTO COURTESY OF WILDSEED FARMS

hint to guess his most popular flower varietal. What else could it be but the state's flower, the bluebonnet?

"The old Texas bluebonnet is a rite of spring," he says. "If that doesn't say 'sweet Mother Texas,' I don't know what does."

Thomas' passion for these iconic blooms is unmistakable. For him, the flowers are a nostalgic reminder of nature's immense beauty and of a shared Texas experience passed down over generations. En masse, the flower's trademark blue is arresting and deeply spiritual; Thomas believes that the sight inspires reflection, inviting those who witness it to slow down and savor the moment.

Wildseed Farms has evolved into a place laden with memories and tributes. Lady Bird Johnson used to visit the nearby farm a few times a month, and one of her favorite flowers — the showy primrose — is planted in her honor at the front of the property. Frequently, people come to spread their loved one's cremated ashes at Wildseed, a place that

fittingly conjures feelings of peace, hope and renewal.

No matter the time of year, there's always something blooming and growing at Wildseed Farms.

"This is the real deal," says Thomas. "You'll see us plowing, planting, harvesting, weeding — we're open year-round."

Thomas' belief is that even when the fields are bleak, before winter's tiny sprigs transform into spring's kaleidoscope of Indian blankets, cosmos, California bluebells and African daisies, the life and energy rooted below the farm's surface should be celebrated.

"There is a God," he says. "There is no doubt about that when you see this place."

Much like Thomas' faith, the wildflower's spirit and energy is present even when the flower itself is invisible to the eye. In late fall and early winter, many fields across Wildseed Farms are layered in fresh brown soil, beneath which grow masses of wildflowers. Any baby

bluebonnets that have sprouted can be identified thanks to their tiny leaves, which resemble Mickey Mouse ears the size of dimes.

For the thousands of others that rest beneath the surface, Thomas assures, "You can't see them, but they are there growing."

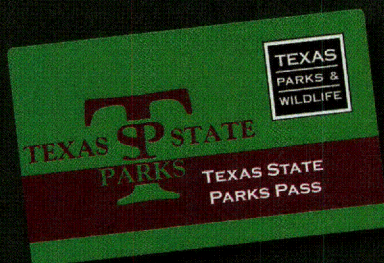
Equally fascinating is the wildflower's journey. When the blooms fall and their seedpods burst, the seeds within them blow on, dropping wherever the wind takes them. For Thomas, seeing a patch of flowers, such as bluebonnets, spring up in a place that wasn't previously planted is one of the enduring gifts of wildflower farming. More often than not, these patches come as a surprise, blooming after being deep-seated and dormant for years.

"You may not see certain flowers for five years and then here they are," he says. "That is the romance of the wildflower." ★

Sallie Lewis is a freelance writer from San Antonio.

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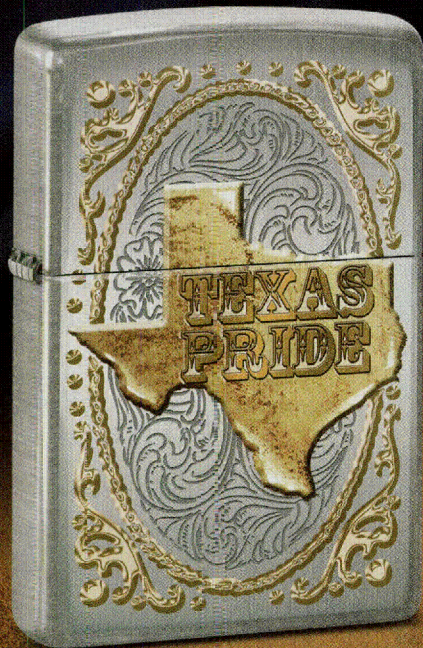
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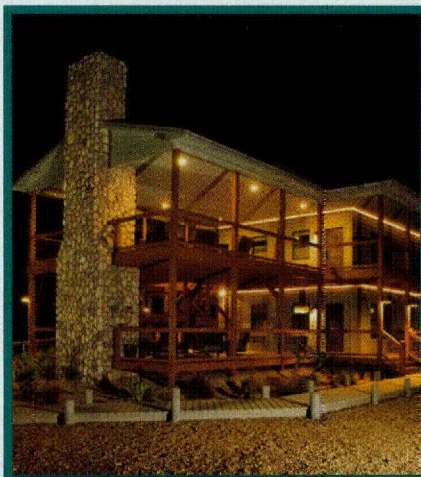
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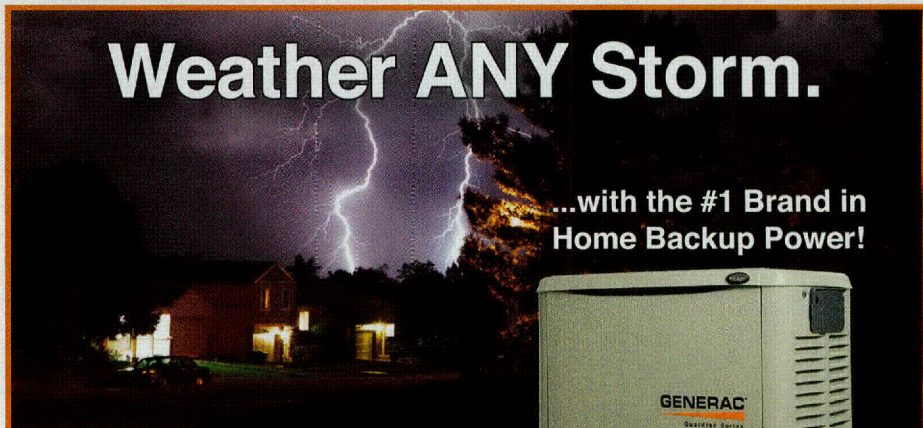
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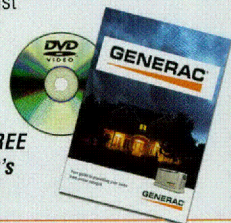


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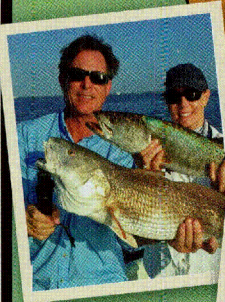
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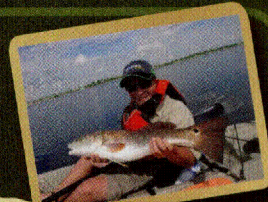
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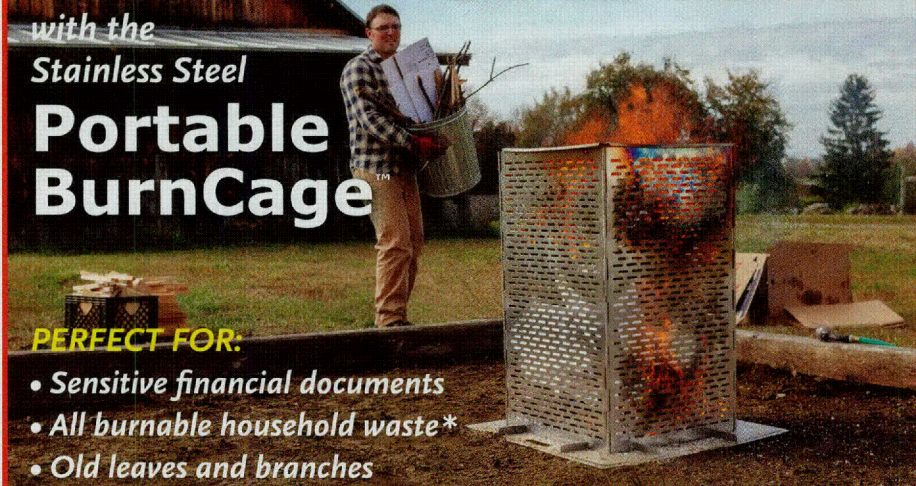
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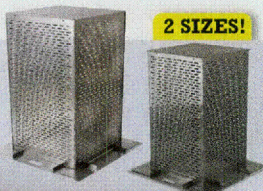
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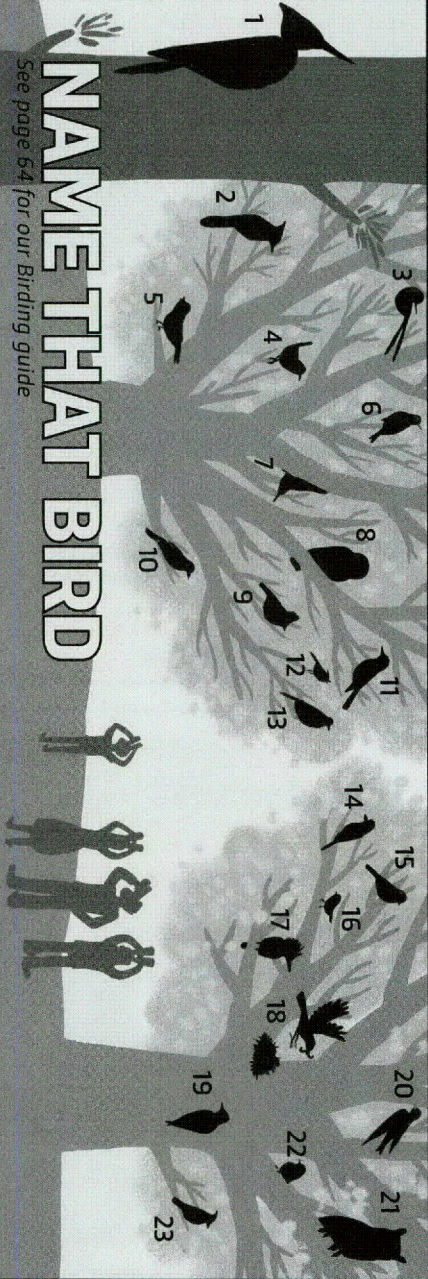
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| 5. Painted bunting | 17. Ringed kingfisher |
| 6. American robin | 18. Northern mockingbird |
| 7. White-breasted nuthatch | 19. Red-headed woodpecker |
| 8. Barred owl | 20. Purple martin |
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You are a man of the wilderness. The only plan you have is to walk up that mountain until you feel like stopping. You tell your friends that it's nothing personal, but this weekend belongs to you.

You've come prepared with your *River Canyon Bowie Knife* sheathed at your side. This hand-forged, unique knife comes shaving sharp with a perfectly fitted hand-tooled sheath. The broad stainless steel blade shines in harmony with the stunning striped horn, wood and bone handle. When you feel the heft of the knife in your hand, you know that you're ready for whatever nature throws at you.

This knife boasts a full tang blade, meaning the blade doesn't stop at the handle, it runs the full length of the knife. According to *Gear Patrol*, a full tang blade is key, saying "A full tang lends structural strength to the knife, allowing for better leverage ...think one long steel beam versus two."

With our limited edition *River Canyon Bowie Knife* you're getting the best in 21st-century construction with a classic look inspired by legendary American pioneers. What you won't get is the trumped up price tag. We know a thing or two about the hunt—like how to seek out and capture an outstanding, collector's-quality knife that won't cut into your bank account.

This quintessential American knife can be yours to use out in the field or to display as the art piece it truly is. But don't wait. A knife of this caliber typically cost hundreds. Priced at an amazing **\$49**, we can't guarantee this knife will stick around for long. So call today!

Your satisfaction is 100% guaranteed. Feel the knife in your hands, wear it on your hip, inspect the craftsmanship. If you don't feel like we cut you a fair deal, send it back within 60 days for a complete refund of the sale price. But we believe that once you wrap your fingers around the *River Canyon's* handle, you'll be ready to carve your own niche into the wild frontier.



BONUS! Call today and you'll also receive this genuine leather sheath!

What customers are saying about Stauer knives...



"First off, the shipping was fast and the quality is beyond what I paid for the knife. Overall I am a satisfied customer!"

— D., Houston, Texas

River Canyon Bowie Knife \$79*

Offer Code Price Only **\$49** + S&P **Save \$30**

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You must use the insider offer code to get our special price.



Not shown actual size.

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*Discount is only for customers who use the offer code versus the listed original Stauer.com price.



Rating of **A+**



• Full tang 4 1/4" stainless steel blade, 9" overall length • Genuine horn, wood and bone handle • Polished brass guard and spacers • Includes leather sheath

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Birding

ILLUSTRATION © JESSICA BLANK

WHETHER IN OUR own backyard or at a state park, the beauty, behavior and songs of birds inspire us to don binoculars for a closer look. This spring, the Great Texas Birding Classic is celebrating its 20th year, providing an annual outlet for our birding fever. From April 15 until May 15, hundreds of birders across Texas will venture out in a competitive search to record the highest number of observations in a multitude of categories. Deadline to register is April 1, so don't delay! Sign up at tpwd.texas.gov/gtbc.

Want to join in but need a little help getting started? Birding is an easy activity for everyone, but a few basics will help you find success and have fun.

Birds like to breed, migrate and eat, so think like a bird to find popular hangouts. Look for birds at rookery breeding sites during the spring, along migration routes in spring or fall or on the coast year-round. Get out during dawn or dusk to catch the most traffic. Don't want to leave your backyard? Birding can be done anywhere. In fact, cities harbor 20 percent of the world's total bird species.

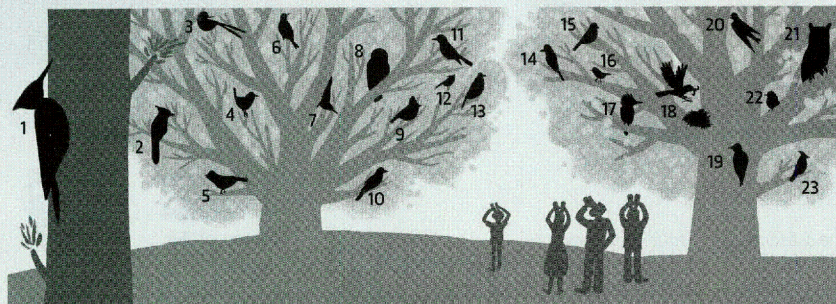
Racking up numbers on your life list can be difficult when the most common view you get is a flyby, so learn how to distinguish birds on the fly. Tune your focus to distinguishing features and remember that the appearance of a species varies by sex, season and age.

Lucky for us Texans, we live in one of the country's top birding destinations. Of the 338 species that are listed as nearctic-neotropical migrants in North America (north of Mexico), a whopping 98.5 percent of them have been recorded in Texas. Another way to look at it: 53 percent of the 629 species of birds documented in Texas are migratory birds. Texas is important to these migrants, and these migrants are important to Texas.

— Emily Moskal

NAME THAT BIRD

Can you identify the 23 Texas bird species in our illustration? Turn to Page 61 for an identification guide.



GEAR UP



LIFE LIST

A life list is a list of every species of bird an individual birder has seen, or heard, in the world. Create your own list, or use the American Birding Association's ready-to-print checklist.



FIELD GUIDE

Get a field guide that is local, heavily illustrated in color and lightweight. *The Sibley Field Guide to Birds of Eastern North America* (or *Western North America* for West Texas) and *A Field Guide to the Birds of Texas and Adjacent States* (Peterson Field Guides) are favorites among birders.



BIRD CALLS

Train your ear with smartphone apps or CDs. *The Sibley eGuide to the Birds of North America and Birding by Ear: Eastern/Central North America* (Peterson Field Guides) are great starters.



BINOCULARS

7x to 8x magnification and 35mm to 42mm objective lens sizes are recommended. Larger lenses aren't always better. Remember you'll be carrying these binoculars around your neck. Weigh your options.



TELEPHOTO LENS

Can't get close or remember the color? No problem. Nikon and Canon, with focal lengths up to 800mm, remain the most popular lenses among bird photographers.



NOTEBOOK

Rite in the Rain all-weather notebooks and a pencil are great for recording sightings and observations in unexpected weather and can survive dips in the lake.



INATURALIST ACCOUNT

Share your photos and notes with other bird lovers in The Birds of Texas project. www.inaturalist.org/projects/birds-of-texas



VOLUNTEER

PROTECT TEXAS' WILD THINGS AND PLACES

Texas' state parks, wildlife, lands and waters all depend on our volunteers. Whatever your interests or skill level, we have a volunteer opportunity for you. So bring your friends (or meet some new ones) and come help protect the outdoors you love. Here are just a few opportunities across the state:



Get Outside Events

Help out with fishing, archery and other activities at fun-filled events that introduce kids to the outdoors.



Texas Master Naturalists

Join fellow citizen scientists on conservation projects and community outreach.



State Parks

Build and maintain state park trails. Be trained to give guided hikes, caving tours and more!



Texas Youth Hunting

Share your hunting knowledge with young Texans and become a Huntmaster.



Go Fish Events

Teach families basic fishing skills at workshops around the state.



Life's better outside.®

www.tpwd.texas.gov/volunteer



The *Texas Parks & Wildlife* magazine team took a staff meeting outdoors on one unseasonably springlike February afternoon. Editor Louie Bond spied the first bluebonnet of the season, unusually early, and bent down with her iPhone 6 to capture it. She set the phone right next to the flower, pushed the focus and shutter a few times, and captured this unusual shot. "I couldn't wait to share the photo with our friends on Instagram," Bond says. "Social media allows us immediate interaction with our readers. I just love that." Follow us on Instagram @tpwmagazine. **TOOLS:** iPhone 6 shot at 4.15mm f/2.2 at 1/400 of a second, ISO 32



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*"The true meaning of life
is to plant trees,
Under whose shade
you do not expect to sit."*

- NELSON HENDERSON

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DEEP ROOTS FOR
GENERATIONS TO COME.
PLEASE REMEMBER
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WILDLIFE FOUNDATION
IN YOUR ESTATE PLAN.



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