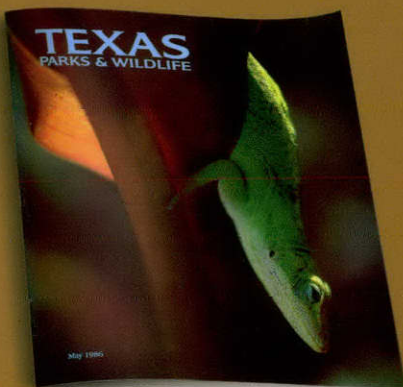


WOODY ON THE GUADALUPE
Photographer finds his
inspiration on a wild river

NATURAL PLAYSCAPES
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best playgrounds for kids

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JULY 2017

40

Natural Play

Goodbye, big structures.
Hello, dirt and sticks.
Old-fashioned fun is
back in style.

by Jennifer Bristol

PHOTO © KERTVA HORNBY / COURTESY OF BUFFALO BAU/OU PARTNERSHIP

Barbara Fish Daniel Nature
Play Area, Houston

ON THE COVER:

The green anole is a common lizard in the eastern parts of Texas. It faces increasing competition from an invader, the brown anole. Photo © Theresa DiMenno

BACK COVER:

A nine-banded armadillo crosses a country road at dusk in the Texas Hill Country. Photo © Heidi and Hans-Juergen Koch / Minden Pictures

28 New in Town

Texas' landscape features an ever-evolving roster of species.

by Russell Roe & Cullen Hanks

34 Woody on the Guad

Photographer channels his passion for a wild river into imagery.

by Camille Wheeler

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↑ **“I’M FRIENDS WITH
MY INSURANCE AGENT.”**

— WOODY WELCH



PHOTO © RUSSELL A. GRAVES



PHOTO © RUSSELL A. GRAVES

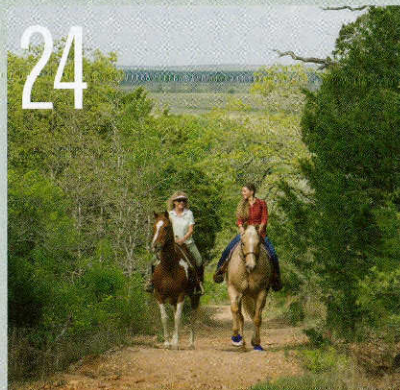


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ILLUSTRATION © JESSICA BLANK

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FROM THE EDITOR

THE OLDEST GIRL wears a crown of drooping wildflowers in her tangled hair and waves a stick with an old tennis ball attached to one end as a scepter. She regally hands out roles to a happy mob of grimy playmates in the woods behind our home. "Play like you're all protecting me from the evil witch and her dragon!" she shouts to the smaller children. Excitedly, her brother and a cousin run off to plan an "attack" on the castle, while the remaining kids make plans to defend the old school bus. The tiniest of the children are instructed to "prepare the feast" for after the battle.

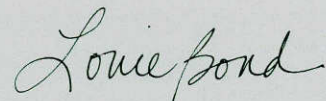
This was a timeless scene of endless summer afternoons set on repeat when my four kids were joined by cousins and neighborhood children on our hillside. On scorching-hot days, the hose emerged, perhaps accompanied by water guns or wading pools. With a swingset, a trampoline, a tree fort, that old Studebaker school bus and the occasional tent as set locations, those lucky kids whiled away their youth lost in imaginary, nature-based play.

Though only a few decades have passed since those idyllic days, much has changed in the world of play. Stand-alone swings and slides were connected and conjoined into mega-playscapes, coated and cushioned and clean as shiny pennies. Of course, kids adored them, and organizations raised tens of thousands of dollars to erect these ultra-modern edifices on every church and school playground.

The dark cloud behind this silver lining? Kids grew further away from natural fun like digging up earthworms and rolling down hills. Dirt became something to avoid rather than embrace. Kids began to fear insects, rather than be fascinated by them. Good, old-fashioned, dirty fun was no longer fashionable.

Enter Children in Nature, Richard Louv's groundbreaking movement to reconnect kids with nature. As we began to focus on getting kids outside again, we also realized that traditional playground design can sometimes inhibit that natural interaction. Safety concerns led to limitations on the creativity, challenge, flexibility and natural features of outdoor spaces. Now, a natural play revolution is occurring across the nation, and Texas state parks and other outdoor spaces are following suit, constructing playgrounds that reflect the woods and the prairies, the beach and the mountains. Native plants grow nearby, populated by butterflies and birds and shy lizards. Kids are happier, healthier and more inclined to stay outside.

Take a day trip to Government Canyon or Mother Neff this summer to check out these "new" old-fashioned playgrounds, or "build" one in your own backyard with a pile of dirt, some pots and spoons, boxes and sticks, a bunch of energetic children and a heaping helping of imagination.



Louie Bond, Editor

THE CHANGING NATURE OF TEXAS

GREEN JAYS IN COTULLA. Black-bellied whistling ducks in Smiley. White-winged doves in Round Rock. Red mangrove near Port Aransas. Eurasian collared-doves in Electra. Zebra mussels in Lake Texoma. Giant salvinia in Caddo Lake.

Today, those observations wouldn't warrant much more than a perfunctory glance or passing comment, much less space in this magazine. But the first time I saw those species in the aforementioned locales, you can be assured it was a big deal. At least it was to me and others like me, outdoor types who paid attention to the birds and the plants and the game and such — where they were supposed to be and, just as importantly, where they weren't.

As you might imagine, some of those sightings were a whole lot more welcome than others. A cluster of white-winged doves flying over me as a kid on a farm just north of Round Rock fit that bill. So, too, did a magnificently colored green jay perched on a big willow limb hanging over a La Salle County stock tank. A big floating mat of giant salvinia swamping the surface of one of my favorite water bodies, Caddo Lake? Not so much.

If we have learned anything about nature over the years, it is that nature is by no means static. Changes across the landscape in habitat type, species occurrence and composition, population abundance and geographic distribution are inevitable, made even more so by the pressures of evolving land uses, habitat alterations, water usage, human population growth, incursion of invasive and exotic species, changing climates, predator/prey dynamics and a whole lot more.

To best understand how these changes affect the lands and waters we call home (as well as the fish and wildlife species that reside here), one needs a good benchmark, a beginning point in time, if you will. Selecting any particular time frame is admittedly fraught with subjectivity and sometimes subject to the befuddlement of a geologist or two, who tend to think in thousand- and million-year time spans, not mere decades or even centuries.

Geologic-centered perspectives aside, one of the best treatises on the matter came from David Schmidly in his book, *Texas Natural History: A Century of Change*. Schmidly, a highly regarded biologist and former president of Texas Tech University, set about documenting how Texas' mammalian composition had changed over the course of the 20th century. His point of comparison was the extensive biological survey

that a band of field biologists led by Vernon Bailey conducted across the state and published in 1905.

What Schmidly documented was fascinating. The changes over the course of a mere century were dramatic, particularly for large mammals like bison, wolves, jaguars, pronghorn and bears. But there were significant range contractions and expansions for small and mid-size native mammals as well. Armadillos and porcupines expanded their ranges considerably; black-footed ferrets and prairie dogs did not. Muskrats appeared to shift their range away from inland areas to the coast, while new species of bats made their way into Texas for the first time and sizable herds of exotic game became naturalized on ranches across the state.

In this issue, my colleagues Russell Roe and Cullen Hanks tackle the same subject of ecological change, addressing distributional changes in species from white-winged doves to Rio Grande chirping frogs. A major tenet of their thesis is that things change over time, providing both opportunities and challenges for biologists who must wrestle with such things, including what constitutes desirable change and what doesn't. And to whom, and when does it matter.

From arresting the declines of lesser prairie-chickens and pronghorn antelope to recovering Guadalupe bass in Hill Country streams to fighting the spread of invasive species such as Chinese tallow, zebra mussels and hydrilla, the Texas Parks and Wildlife Department's fish and wildlife biologists have a formidable task keeping Texas wild. Their jobs are literally as big as Texas, working each and every day to ensure that we have healthy habitats across the state's rangelands, forests, watersheds and water bodies. Be assured, they carry it out with great passion and purpose each and every day.

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



EXECUTIVE DIRECTOR

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IN PRAISE OF PAINTED BUNTINGS

I was telling my walking buddy that a pair of painted buntings had moved into the abandoned woodpecker hole in one of my pear trees. I had seen the male several times and noticed a baby filling the entrance. Then we got to the mailbox and found your publication (May 2017) with a painted bunting on the cover!

MARTHA CHAPPELL
Belton

What beautiful pictures on the cover and pages of the May 2017 issue. The first time we saw a painted bunting from our porch in Anderson County, I thought it was someone's exotic pet. Thank you for the story ("Searching for the Rainbow Flyer"). We also see pileated woodpeckers and would love to see a spread on these big beauties.

C. L. KOLSTAD III
Palestine

I live between Ingram and Hunt. Last July, a painted bunting knocked himself out on my glass door. I picked him up, ascertained he was still alive and administered Reiki to him while speaking softly. When he finally came to, he rewarded me by allowing me to photograph him sitting on my finger. It was a delightful experience. I really enjoy this magazine!

MARY BARBARA GOLD
Ingram

INVASIVES MOVING FAST

The yearlong celebration of the 75th anniversary of *Texas Parks & Wildlife* magazine is a very creative and enjoyable journey into the past. I cherish the memory of family camping in the 1940s as a 7-year-old, with folding wooden "army cots" and mosquito netting, and cooking on a

"charcoal burner." Now in my 80s, I enjoy paddling my kayak on rivers and lakes. I am a TPWD-approved guide for the "Paddling the Forks" tour.

Your April 2017 article "The War on Aquatic Invasives" held special interest. On relatively new Lake Naconiche near Nacogdoches, there is an invasion of giant salvinia

already. A group of local kayakers/canoists is working with ranger Bill Plunkett and TPWD to eradicate this menace. The group FROGS (Focused Removal Of Giant Salvinia), composed of volunteers, works to remove this plant, which has the potential of destroying both fish and native plant life by preventing light from entering the water.

We can improve our health, enjoy the outdoors and protect the environment through such activity. "Go FROGS!"

GEORGE PATTERSON
Nacogdoches

1974 INSPIRATION

I'd like to thank *Texas Parks & Wildlife* magazine for printing a story on decoys in a 1974 edition. Thanks to that article, duck carving has been a wonderful hobby of mine for the past 42 years.

BOB SITTON (SITTON DUCKS)
Nacogdoches

VULTURE AIR SHOW

A fist-bump to Dale Weisman for the article on vultures in the March issue ("Gruesome Gliders"). As an old pilot, I enjoy an almost daily turkey vulture air show from late September through February from my backyard. At times, the kettles number more than 100 birds.

R.G. MURDEN
Weslaco

SA Zoo Begins Horned Lizard Reintroduction

THE SAN ANTONIO Zoo Department of Conservation and Research is embarking on an ambitious effort to reintroduce the Texas horned lizard to areas where it has been extirpated in recent decades.

The first step is to establish a captive breeding colony of these iconic lizards as well as red harvester ants, their primary prey in the wild. The goal of this "lizard factory" will be to produce large numbers of lizards for release in suitable habitat.

Release sites will be selected based on site condition, plant communities and soil types, absence of high

numbers of lizard predators (fire ants) and location. Preliminary assessment includes detailed mapping information developed by TPWD's Amie Treuer-Kuehn in conjunction with her potential habitat maps, followed by boots-on-the-ground assessments to evaluate actual conditions.

A small grant from the TPWD Reptile and Amphibian Research and Conservation Fund will establish the captive colony, but donations are welcomed for the continuing work. This project builds on work conducted by TPWD, Dallas Zoo, Fort Worth Zoo and Texas Christian University.



ILLUSTRATION BY TPWD

Texas Coast Gains Two New Artificial Reefs

TWO NEW ARTIFICIAL REEFS are now in place in the Gulf of Mexico, just 6 miles off the coast of Port O'Connor. The near-shore reefs will create marine habitat that will attract a variety of sea creatures, which will in turn draw anglers and divers for recreational opportunities.

The project is part of Texas Parks and Wildlife Foundation's fundraising effort Keeping it Wild: The Campaign

for Texas. Coastal Conservation Association's (CCA) Building Conservation Trust, CCA Texas and Shell Oil Company partnered with the Texas Artificial Reef Program on this project.

The two adjacent reefs consist of 700 concrete pyramids that have been placed nearly 70 feet deep. The 2,500-pound pyramids have holes large enough for fish to swim through, with limestone embedded outside to provide marine life such as worms and other invertebrates with a hard substrate. The structures also have an opening at the top large enough to allow any sea turtles to escape if they wander in. The structures were placed within a 381-acre reef site, the second-largest site ever permitted in Texas waters.

VISTA Volunteers Assist TPWD

THE ENERGIES of a bright, young group of service workers will benefit the Texas Parks and Wildlife Department for the next three years. The VISTA volunteers will work to increase accessibility of TPWD resources to low-income youth, as well as Texas veterans and their families. A dozen young people will work in human resources, communications, inland fisheries and state parks, with a focus on outreach, education, program development, partnership development and volunteering.

RADIO

Passport to Texas is your guide to the great Texas outdoors. Any time you tune in, you'll remember why you love Texas.

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ON TV

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JULY 2-8:
Tracking bat disease; wildlife watchdogs; honoring an angler; biking Government Canyon.

JULY 9-15:
Arundo cane control; moving bees; West Texas' Davis Mountains; wind energy and wildlife.

JULY 16-22:
Bee searcher; Brazos Bend biking; rat snakes; wind energy on the coast; turkey work.

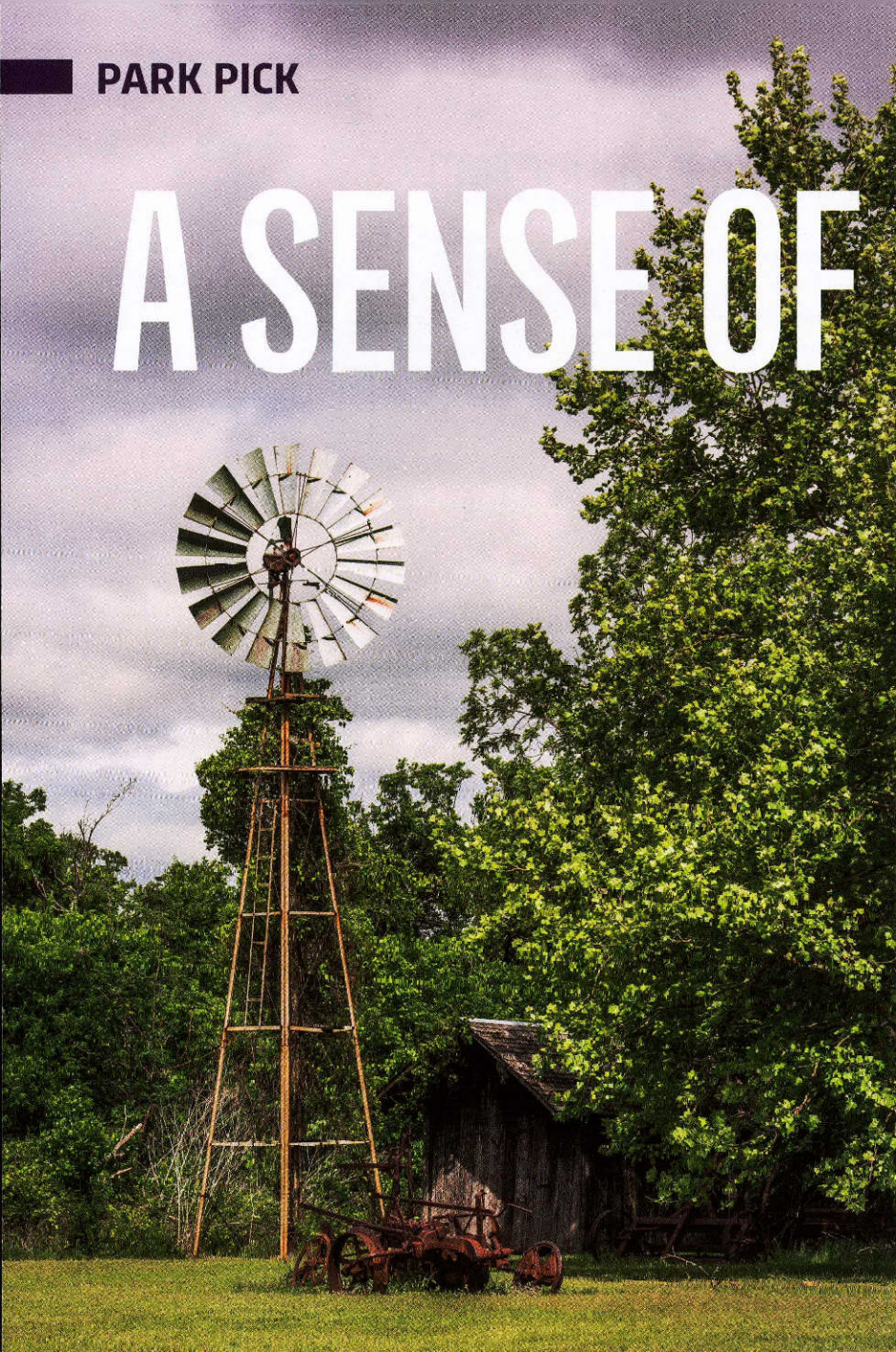
JULY 23-29:
Dundee fish hatchery; Colorado River conservators; squirrel hunting; relaxing at Tyler.

JULY 30-AUG. 5:
Mobile storytellers; creel survey; hiking dogs; protecting paddlefish; grasslands.



Researchers track white-nose syndrome in Texas bats.
Watch the week of July 2-8.

A SENSE OF PLACE



Penn Farm harkens back to simpler times with authenticity.

BY DENNIS GEROW

CONSIDER THIS: You're driving down an old country road, a road you've taken countless times. As you drive along you recall the old barn that once stood under that mott of live oaks, the ghost of an old windmill or the ruin that was once a century-old rock house. Your landscape is constantly changing, and memories of those earlier ones grow distant, then linger, before they disappear.



And yet, deep in the heart of Texas, an old farmstead defies time. Penn Farm sits nestled within the lush woodlands and prairies of Cedar Hill State Park southwest of Dallas. It's quiet here. You can sense what John Anderson Penn must have felt when he decided to put down roots on this spot in the 1850s: the fertile soil and highly productive tall-grass prairie, the abundant wildlife, the sense of place. It's a place strong enough to anchor a family for generations.

Penn Farm is an authentic Texas farm. Preserved, not restored, the farm is a stroll back in time, an instinctive reminder of where we came from, what



PHOTOS BY CHASE FOUNTAIN / TPWD

we've endured and where we've been. Established shortly before the American Civil War and home to one family for more than 100 years, the site consists of farmhouses, barns, cribs, pens and cabins. It's a large spread that reveals itself a little at a time, so you can slow down to an easy walk and linger to let your impressions take hold.


The 1918 barn is at its heart, a large, sprawling pole structure with steeply pitched gable roofs that incorporate and protect a 19th century log cabin and an 1870s schoolhouse. Built to support the Penn family's cattle operation, the barn sheltered livestock and provided storage for hay and grain. These days, as in the past, the barn functions as a magnet for the many bird species that inhabit the area.

The park plays host to the annual Harvest Heritage Festival, and on any particular day it's not uncommon to find families or school groups exploring the barn and other structures. You might even see young couples posing for engagement photos in front of an old barn door, making sure that the memories last.

For more information, go to tpwd.texas.gov/cedarhill. ★

In keeping with this month's 1980s theme, our Park Pick features a park acquired in the '80s: Cedar Hill in 1982.

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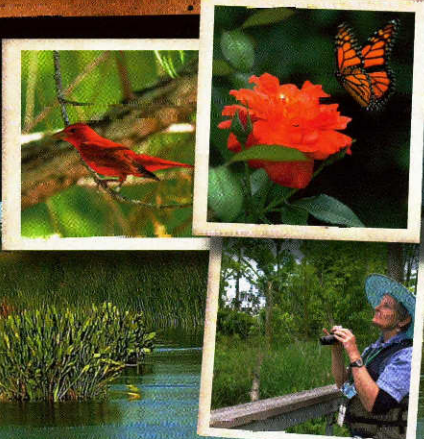



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BADGER SWAGGER

Musk-scented badgers burrow for food, shelter and defense. **BY EMILY MOSKAL**

THE AMERICAN BADGER'S GOT SWAGGER. With short legs and a broad body, it has a profile like a military tanker. It's incapable of carrying out the agile pounce of a puma, but its confident waddle demands respect.

Power-packed with menacing inch-long claws, muscular arms and loose skin capable of twisting free from fearsome predators, badgers are a formidable foe. Their keen sense of smell is second only to a dog's.

A badger can dig backwards to disappear

within the soil with its fangs exposed like a snare trap when facing a predator. If directly confronted, the badger can frighten larger assailants by flashing those claws and emitting lion-like snarls and growls.

Those sharp claws are more than just weapons. The badger's a bit of a bulldozer,

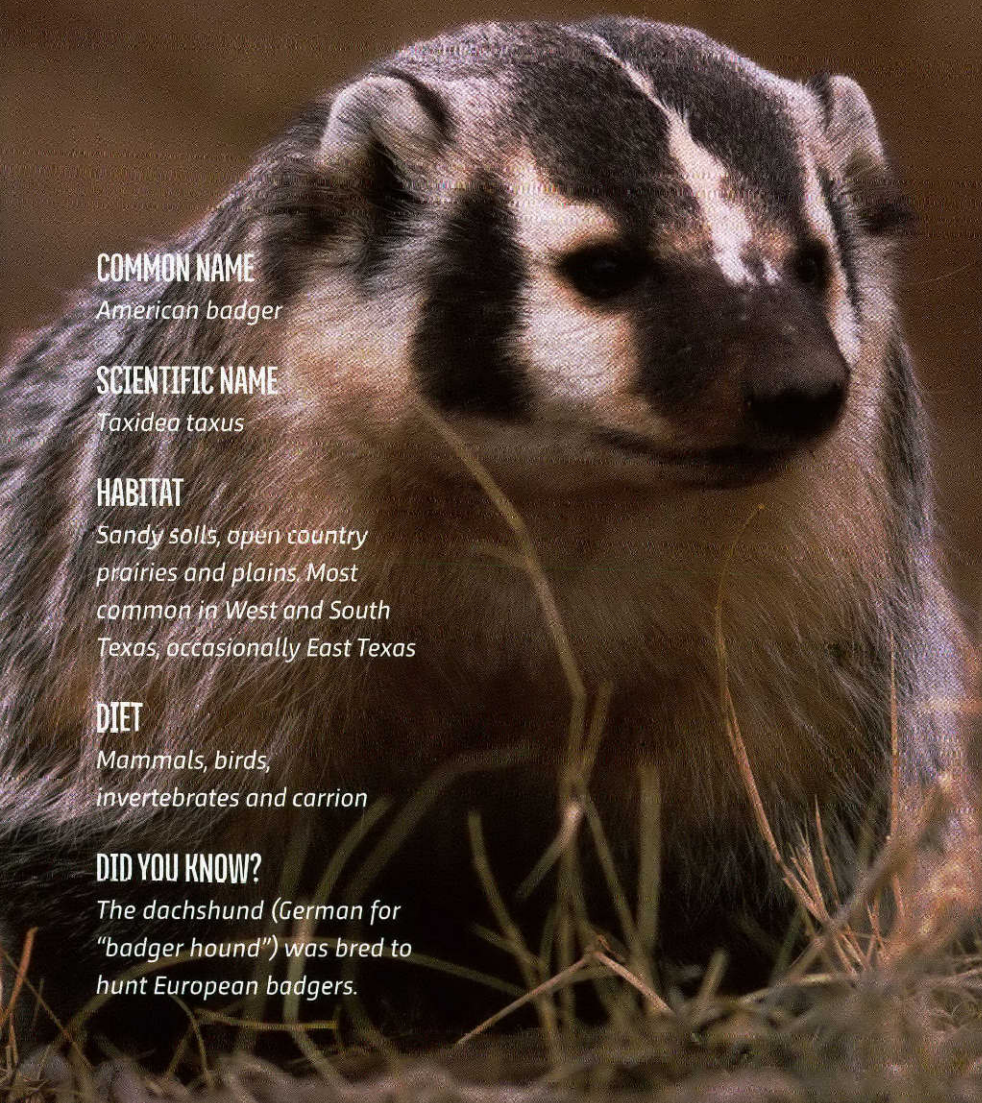
breaking ground with the front claws and flinging soil with the rear in one seamless, efficient way of digging a shallow burrow to find food or settle in for a rest.

During mating season in late summer, the badger will dig a long underground den, called a sett, with designated rooms including a bathroom. The female's fertilized embryos don't mature right away; one to five pups are born in March or April. The pups stay with mom until the late fall, when they set out on their own for another 10 to 12 years.

Badgers reach 3 feet in length at maturity and weigh up to 25 pounds. They sport shaggy fur and a distinctive white stripe down the middle of the face.

One interesting item on the badger's menu is rattlesnake. Badgers are mostly unaffected by venom, with a skin too thick to pierce except for one vulnerable spot, the nose. At the other end, anal scent glands release the signature strong-odored musk of wolverines, weasels, ferrets and minks.

Despite their fierceness, badgers make good neighbors on cattle ranches, where their habit of burying excess prey may help prevent the spread of disease from dead animals, particularly in the desert. *



COMMON NAME

American badger

SCIENTIFIC NAME

Taxidea taxus

HABITAT

Sandy soils, open country prairies and plains. Most common in West and South Texas, occasionally East Texas

DIET

Mammals, birds, invertebrates and carrion

DID YOU KNOW?

The dachshund (German for "badger hound") was bred to hunt European badgers.

TEXAS JUST GOT QUIETER.



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JULY 2017 ★ 15

GLORY, HALLELUJAH!

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Beach morning-glories hang on tight so dunes don't wash away.

BY DYANNE FRY CORTEZ



COMMON NAME

Beach morning-glory

SCIENTIFIC NAME

Ipomoea imperati,
Ipomoea pes-caprae

SIZE

A foot tall with a spread of 30 feet or more

DID YOU KNOW?

Sweet potatoes are members of the morning-glory family.

LIFE IS TOUGH for a plant on the beach side of a sand dune. The wind is always blowing, battering stems and leaves with salt spray or burying them under new layers of sand. The shifting mounds don't contain much organic matter, so fertilizer is in short supply. There's plenty of sun for photosynthesis, but no shade when rays get too intense. Although dunes typically form beyond the high-tide line, storms occasionally flood them with saltwater.

Lo and behold, beach morning-glories actually thrive in this hostile environment. The vines grow fast, crisscrossing the sand with 20- to 30-foot runners. Take a seaside walk on a summer morning, and you're likely to see them in bloom. The 2-inch funnel-shaped flowers, typical of the morning-glory family, tend to open early and close in the heat of the day

Two species are found on Texas beaches. *Ipomoea imperati*, known as beach or fiddle-leaf morning-glory, has white flowers with yellow centers. Its leaves are usually more long than wide, and may be fiddle-shaped, arrowhead-shaped or smooth-edged. Their leathery texture resists drying winds and damage from abrasive sand. *Ipomoea pes-caprae*, often called railroad vine, has deep pink or fuchsia blooms. This plant is also called goat's-foot morning-glory (a literal translation of the species name) because of its wide, two-part leaves, which call to mind the footprint of a cloven hoof.

Beach morning-glories aren't just for looks. With their creeping growth habit and deep roots, they help stabilize dunes

so that other plants can find footholds in the sand. Dune vegetation is key to preserving the barrier islands that protect the Gulf Coast.

"You can see how long their roots are after very high tides, when sand dunes are partially eroded by the water," says Eric Ehrlich, resource specialist at Mustang Island State Park near Corpus Christi. "After one event last winter I roughly measured 5 feet [of root] from the top of a dune to where I was standing."

Neither species is unique to Texas. The white-flowered beach morning-glory grows in all Gulf states. It also appears in Hawaii, where it goes by the local name of hunakai (beach foam). Railroad vine, which prefers slightly warmer and wetter conditions, is found on tropical and subtropical coasts all over the world.

Along with stabilizing roots and showy flowers, beach morning-glories produce plenty of seeds, which can linger in the sand or ride ocean waves to new locations. If a hurricane rearranges the whole landscape, these hardy vines will be among the first plants to recolonize the beach. ★

Nothing to see here,
but a hole in the ground.

PALO DURO CANYON STATE PARK



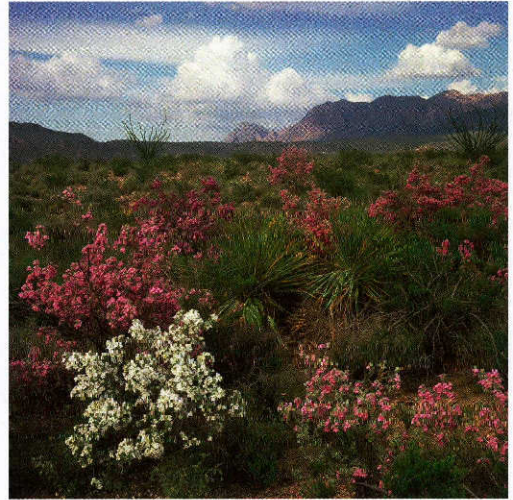
CADILLAC RANCH

Wait! We have cars in the ground, too.

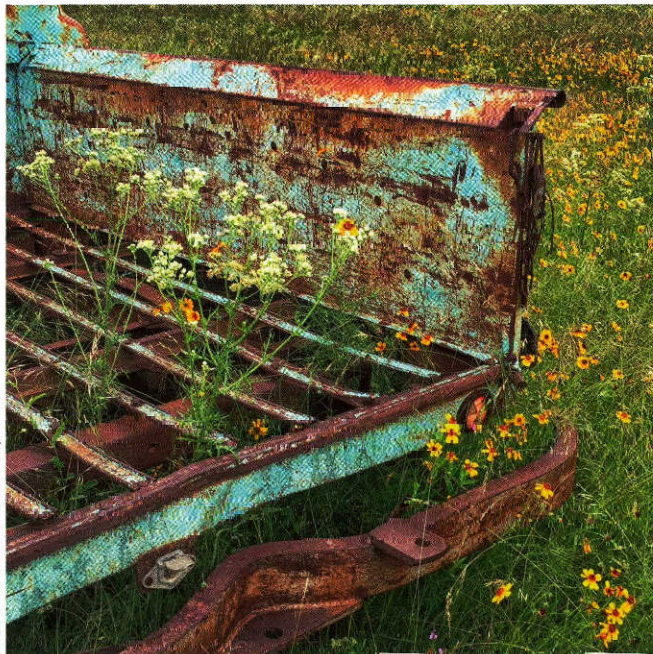
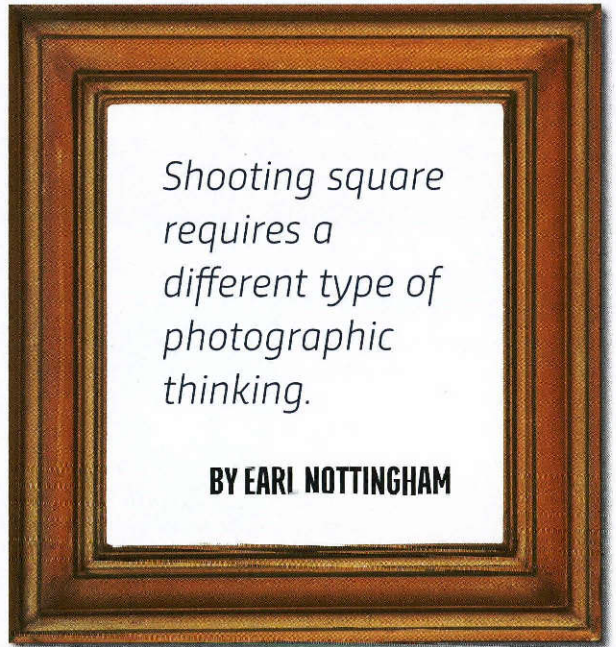
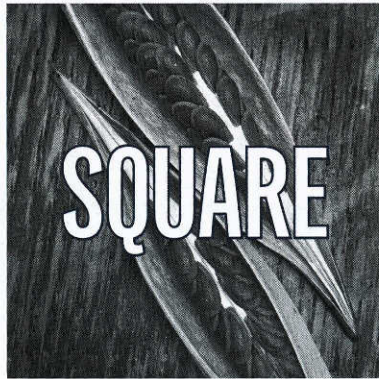
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HIP TO BE SQUARE



PHOTOS BY EARL NOTTINGHAM, "P.W.D."



THROUGH MOST OF THE HISTORY of photography, cameras have typically produced images in a rectangular format regardless of the size of film or digital sensor being used. The photographer must turn the camera one way or the other to produce horizontally or vertically oriented compositions, depending on the subject or scene. However, the 1930s brought a new era in camera formats with the introduction of the square-format camera – namely the venerable Rolleiflex, which was soon followed by other names such as Hasselblad, Yashica and Mamiya.

The new format quickly became the darling of photojournalists and fashion photographers worldwide and gained popularity through the years in amateur cameras such as the Brownie Hawkeye, which documented many generations of American families. Even “toy” cameras such as the Holga or Diana are now a tool of choice for many fine art photographers. Most square-format film cameras are also considered “medium format” and typically shoot a 2¼x2¼-inch image that offers a good combination of film sharpness and lens resolution.

So, what is the allure of a square format? To begin with, there is a simple elegance in the geometry of a square image. Unlike the typical horizontal or vertical frame, which inherently creates its own visual “pull” to the viewer’s eye, the equilateral nature of the square allows the subjects and other compositional elements to determine the feeling imparted by the image.

Subjects and other shapes become more prominent within the tighter bounds of a square, requiring more thought when composing an image. It can be somewhat of a balancing act – moving the elements in the scene or the camera itself until the image “feels” right and conveys the intent of the photographer. As a result, shooting a square image requires a different mindset from existing rectangular composition. You must “think” square.

Obviously, the square image may not be appropriate for all scenes, such as landscapes, which tend to have horizontal orientations. However, with the right scene and careful composition, great landscape


and nature images can be achieved in a square format. Even the black-and-white landscape master Ansel Adams experimented with a square-format Hasselblad in his later years.

While most square-format photographers retain their final compositions as a square, many shoot square knowing that there is always the option to crop the original picture either vertically or horizontally in the darkroom or on a computer, eliminating the need to rotate the camera when shooting.

In recent years, there has been a revival of the square photograph, due primarily to several smartphone apps, such as Hipstamatic and Instagram, which emulate various iconic camera, lens and film combinations. Even native smartphone cameras offer the option to shoot – or crop to – a square.

However, you don’t really need a square-format camera or app to shoot a square image. Any rectangular image from any camera can be cropped square with photo retouching software or some smartphone apps. Obviously, if you plan to crop a square from the original rectangular format, be aware that you will lose part of the subject matter and surroundings on the edges of the frame, so leave a little extra room.

Shooting square can be a great creative and enjoyable exercise for any photographer. It forces you to visualize and compose a photograph in a completely different manner and will fine-tune your compositional eye. You’ll discover that it’s hip to be square! ★



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BLUE SKIES OVER AMARILLO

WORDS AND PHOTOS
BY RUSSELL A. GRAVES

This surprising Panhandle city offers dramatic canyons and unpredictable weather.



It's barely lunchtime, but the Blue Sky Restaurant is already bustling with patrons hungry for its locally famous burgers. Outside, busy Interstate 40 carries traffic to both ends of the country; inside, there's a laid-back Panhandle vibe.

AUSTIN

7.5 hours

DALLAS

5.5 hours

EL PASO

6.75 hours

SAN ANTONIO

7.5 hours

BROWNSVILLE

11.5 hours

HOUSTON

9 hours

Steve Kersh says Blue Sky is his favorite Amarillo eatery, the one he recommends to visitors. For nearly a quarter-century, Kersh has been a recognizable face as a meteorologist for the local ABC affiliate. On the air five days a week, this weatherman's attuned to the people and the places that define the top of Texas.

Yes, I do see the irony of eating at a place called Blue Sky with a TV meteorologist. Weather is a common topic in Amarillo, an omnipresent part of life for Panhandle people. Even as we eat, people stop by our table and ask Kersh for the day's weather forecast.

Panhandle residents live under an enormous

dome of pleasant skies most of the time, but one of the allures of the area, according to Kersh, is the unpredictable weather.

"I grew up near Waco, and down there, the weather is pretty much the same most of the year," he says. "Being a weather fanatic and a meteorologist, the weather here has it all: We get snow, we get rain, we get storms, we get all of it."

Amarillo is at a meteorological crossroads that experiences unsettled weather more often than the rest of the state. The Panhandle is a battlefield for air masses that collide over the High Plains. Not far to

the west, the Rocky Mountain range forces cool, dry air to flow down the plains. During the winter, big blue northers can drop temperatures drastically in just a few hours. Often these big winter storm systems dump large amounts of snow, bringing blizzard conditions across a landscape with few trees to block the advance of surface-level winds.

In early spring, when the weather patterns start to change, the winter blizzards give way to wind storms that churn up dust from the plains. In the 1930s, when prolonged drought and unwise agricultural practices denuded large swaths of cropland soil, these dry storm systems would whip

moist air surging northward from the Gulf of Mexico. That boundary between the two is known as the dry line, a feature that often spawns deadly and destructive progeny in the form of torrential rain, lightning, hail and tornadoes.

This predictability of severe storm formation in the area creates an unconventional tourist attraction, according to Kersh.

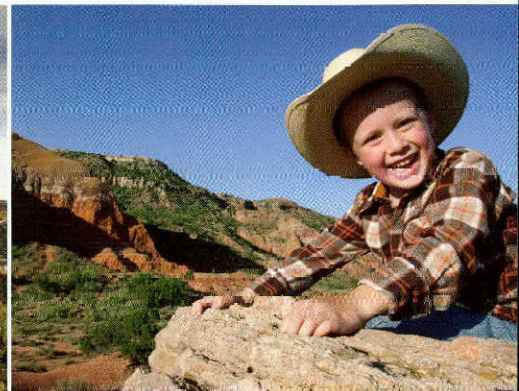
"There's been an explosion of storm chasers in the area," Kersh says. "It has occurred in a couple of waves. The first was in 1996, after the movie *Twister* came out. The second was when the Weather Channel started airing a bunch of tornado content."

to polish off a platter-sized hunk of Panhandle beef in an hour.

Traveling parallel to Interstate 40, Route 66 snakes its way through downtown Amarillo; you can still see original buildings that lined the iconic highway. People who venture down the old road can get a taste of what travel was like prior to the interstate system's network of roads.

On the west side of Amarillo, Kersh and I pass the iconic Cadillac Ranch. Part sculpture and part public art piece, the spot is littered with graffiti from visitors who paint their names on the bodies of the 1950s-era Cadillacs buried nose-deep into the prairie.

"Everybody loves Cadillac Ranch,"



FEATURED ATTRACTIONS (LEFT - RIGHT):

- ★ Steve Kersh, Amarillo meteorologist
- ★ Alibates flint at the Alibates Flint Quarries National Monument
- ★ The Canadian River country in the Texas Panhandle
- ★ Having fun at Palo Duro Canyon

up huge walls of dust that eclipsed the sun. Those "black blizzards" were feared as a sign of the apocalypse, a harbinger of doom.

These days, improved tillage techniques have limited the severity, but dust storms still occur almost yearly, most often in February or March. As April rolls in, the weather turns a bit nastier as the cool, dry air spilling over the Rocky Mountains collides with the warm,

As part of his job, Kersh is often in the field monitoring storms, and he's encountered numerous European and Asian tourists who participate in storm-chasing tours of Tornado Alley.

"Since we have the most tornadoes in this area than any other place in the world, it's a natural draw for people who like weather phenomena," he says. "You get out here and you realize, 'Wow, I can see the sunrise and the sunset, and all kinds of weather.' It's beautiful here."

Soon after lunch, Kersh and I are on the road to see the sights around Amarillo. Besides the Blue Sky, he recommends the famed Big Texan restaurant as a "must stop" for interstate travelers who want to experience some Texas kitsch reminiscent of Route 66 stops. (In fact, the remnants of that road run just north of the Big Texan.) While you enjoy your own tender steak, watch skinny cowboys try their best

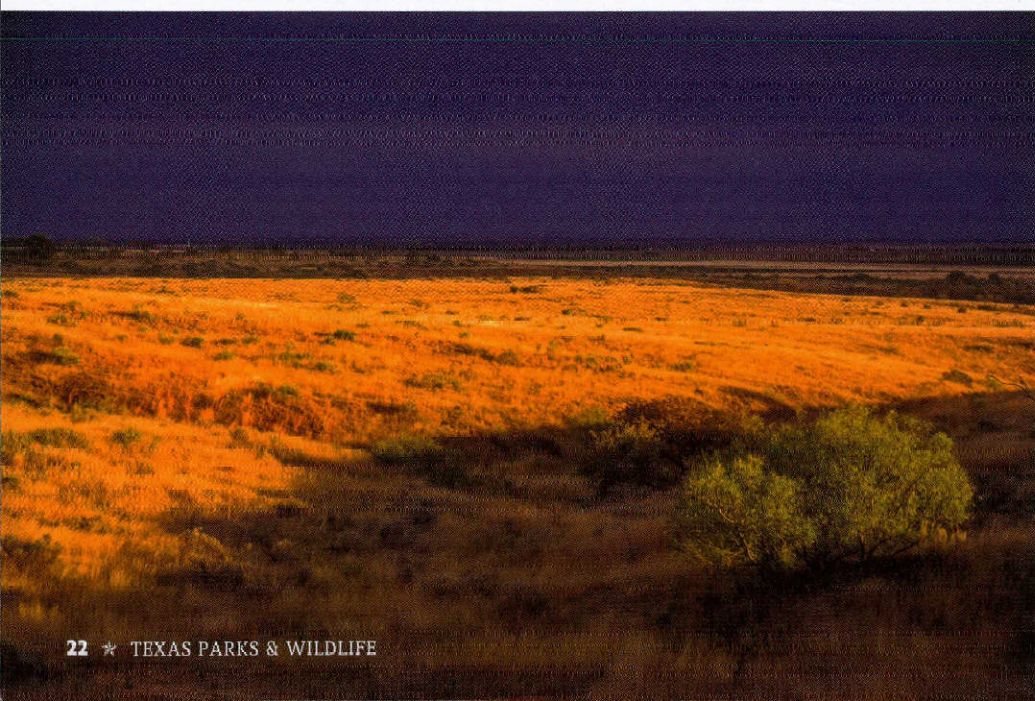
says Kersh, as droves of people walk around the cars and take selfies. "It can be pouring down rain, but people will still be there. This place is a real attraction."

The story of Amarillo is, in a way, the story of our nation's love affair with the automobile. The town is far removed from any navigable water or woods or mountains, but people used to pass through headed somewhere else. Now, the Amarillo area attracts motorists and motorcyclists alike on road trips.

"In general, people downstate think that the Panhandle is just a flat expanse," Kersh says. "That's true to an extent, but there is a surprising amount of topography here."

Road trippers enjoy the scenery as the land changes dramatically from flat to undulating curves.

"The Boy's Ranch road is really pretty," says Kersh referring to FM 1061, a quiet, two-lane road that



MORE INFO:

BLUE SKY RESTAURANT

www.blueskytexas.com/amarillo.html
(806) 355-8100

BIG TEXAN STEAK RANCH

bigtexan.com, (806) 372-6000

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

www.nps.gov/alf, (806) 857-6680

PALO DURO CANYON

tpwd.texas.gov/palodurocanyon
(806) 488-2227

leads from northwestern Amarillo to the Boy's Ranch enclave. "The Canadian River breaks are a nice departure from the surrounding plains."

Kersh and I marvel at the scenery along the road that leads up to Lake Meredith and the Alibates Flint Quarries National Monument north of Amarillo. This federally protected area preserves a site where a rare type of flint was mined and traded by nomadic tribes of Native Americans for centuries.

Kersh's heartiest recommendation for a must-see Panhandle place is the second-largest canyon in the United States.

"The first place I usually take anybody not from the area is Palo Duro Canyon State Park," he says. "Most people have no idea that something that cool exists out here."

For the uninitiated, Palo Duro Canyon is an immense canyon system 6 miles wide that stretches for 120 miles across the Panhandle just south of Amarillo.

This page: Cadillac Ranch is an iconic roadside attraction featuring graffiti-covered 1950s-era Cadillacs buried nose-first in the ground west of Amarillo. The area's severe weather attracts storm chasers who track tornadoes and other weather events. The Panhandle sits at a meteorological crossroads where unsettled weather is common.

Opposite: The Big Texan Steak Ranch is famous for its 72-ounce steak challenge. If a hungry diner can eat a 72-ounce steak in an hour, it's free.



About 28,000 acres of the canyon are dedicated to public use and are contained in Palo Duro Canyon State Park. During most of the year, the park hosts hikers, campers, sightseers and mountain bikers. Each summer, visitors from all over the world come to the canyon to see the musical drama *Texas*. The play follows fictional characters as they settle the plains and endure hardships. For two hours, patrons watch the story unfold under

a canopy of stars and against the backdrop of a colorful canyon wall.

The unpredictabilities of weather and landscape along with mouth-watering Texas steaks, of course — make Amarillo an alluring destination.

“When you drive up to the canyon and see it for the first time, it’s pretty breathtaking,” Keisly says. “It’s always fun to bring new people to this area so they can discover the magic for themselves.” ★



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BACK IN THE SADDLE

Bring your equine friend for a trail ride in Texas parks.

BY AUBRY BUZEK



HORSE PHOTO BY FARI NOTTINGHAM / TPWD. SIGN PHOTO © CZUBER / DREAMSTIME.COM

MCKINNEY ROUGHS NATURE PARK (LOWER COLORADO RIVER AUTHORITY)

Dip your horse's hooves in the cool waters of the Colorado River, stroll through cypress-shaded riverside trails just feet from the water and make the gentle climb to scenic viewpoints overlooking the river and valley beyond. With ample equestrian amenities, stunning views and 12 miles of well-maintained equestrian trails, this is a "can't miss" day-trip park in Central Texas.

HILL COUNTRY STATE NATURAL AREA

With multiple equestrian campsites ranging from primitive to luxurious, this is THE place to go to experience multiday adventures with your favorite equine companion. This secluded retreat boasts a 50-mile trail system that offers scenery and diverse terrain for every riding level. Overnight group options include a 1930s ranch house that sleeps up to nine people and five horses, and the 2-acre Chapas Camp with 10 campsites and a nine-stall barn.

PALO DURO CANYON STATE PARK

It's a good thing this state park offers dedicated equestrian campsites, because it could take days to see all of the colorful beauty "The Grand Canyon of Texas" has to offer. The 1,500 acres of horseback riding property offer a glorious display of shapely boulders, unique rock formations and bright green flora dotting the red sandstone landscape in this Texas Panhandle treasure. For those without horses, several local outfitters offer guided rides for budding equestrians of all ages.

SEA RIM STATE PARK

Every equestrian dreams of riding a horse on the beach, and this park brings that fantasy to life. With 3 miles of prime Gulf Coast beachfront, you and your hooved sidekick can feel the sea breeze blowing through your manes. Bonus points if you can persuade your horse to take a dip in the ocean. In case you are making a long haul across the state to check beach riding off your bucket list, the park offers a primitive campsite so you and your newly minted sea horse can rest overnight and experience an epic East Beach sunrise.

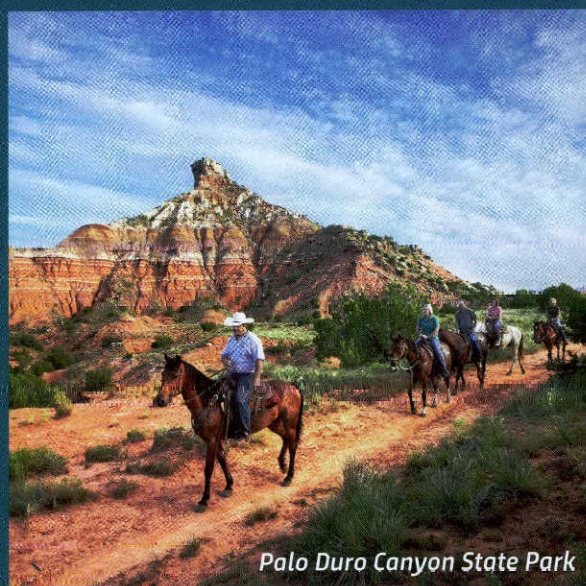
GUADALUPE RIVER STATE PARK

This hidden gem features miles of equestrian trails that wind through ecologically diverse landscapes. On the 2.86-mile Painted Bunting Trail, mosey through an open savannah scattered with live oak trees and spring wildflowers. Although there is no direct Guadalupe River access for horses, peering over the limestone cliff on the River Overlook Trail provides riders and brave mounts with an incredible view of the river flowing below.



McKinney Roughs Nature Park

PHOTO BY EARL NOTTINGHAM / TPWD



Palo Duro Canyon State Park

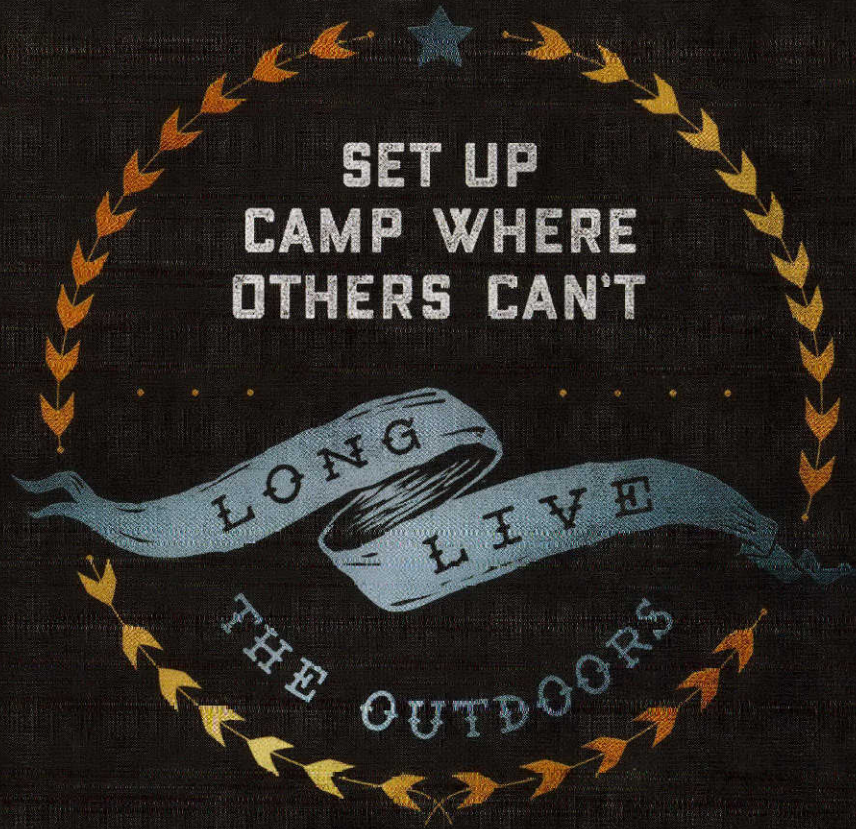
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Guadalupe River State Park

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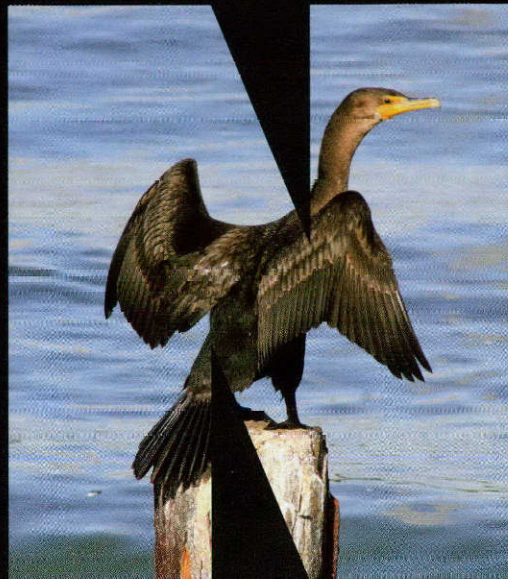
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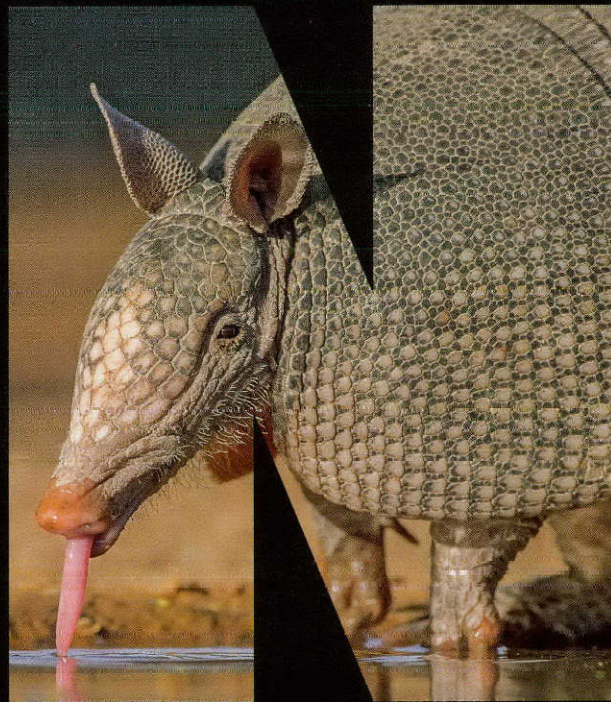
Texas' landscape features an e



PHOTOS (FROM LEFT) BROWN ANOLE © THERESA DIMENNO; EASTERN GRAY SQUIRREL © JOHANN SCHUMACHER; COYOTE BY CHASE FOUNTAIN / TPWD; WHITE-WINGED DOVE © JASON SOUVRES / RED 5 PHOTOGRAPHY; DOUBLE-CRESTED CORMORANT © RON WOOTEN; RIO GRANDE CHIRPING FROG © SETH PATTERSON; MEDITERRANEAN GECKO © JASPER DOEST / MINDEN PICTURES; MONK PARAKEET © CUTTS NATURE PHOTOGRAPHY; NINE-BANDED ARMADILLO © HECTOR ASTORGA



ever-evolving roster of species.



By Russell Roe and Cullen Hanks

From his backyard, Travis LaDuc of Austin can't necessarily see the changing nature of Texas wildlife, but he can hear it. The Rio Grande chirping frogs around his house, emitting a chorus of high-pitched *chirp-chirp-chirps*, weren't there just a few years ago.



Rio Grande chirping frog

"I hear them all summer now," he says of the little frogs, which have been expanding their range across Texas from their Rio Grande Valley home. "It's pretty remarkable going from having a fairly quiet backyard to having all these little guys peeping and squeaking."

Nature isn't static; it's always changing. It always has been, and it always will be. Species are constantly colonizing new areas, adapting to new conditions. The mix of plants and animals you see around you is not what people saw 100 years ago, and it won't be what people will see 100 years from now. Some species will be the same, some will be lost, and others will appear.

"Things change every day, every month, every year," says Shaun Oldenburger, who manages programs for migratory game birds at the Texas Parks and Wildlife Department. "It's an ever-evolving landscape."

We know from the tracks at Dinosaur Valley State Park that dinosaurs walked where we walk today. When prehistoric humans settled in Texas, they found mammoths, camels and saber-toothed cats.

Consider that 99.99 percent of all species that have lived on Earth have gone extinct. Change is essential to the drama and beauty of nature, even if that change is not always pretty. When change happens too quickly, the results can be devastating, as when a massive asteroid 66 million years ago caused the extinction of three-quarters of Earth's plants and animals, including the dinosaurs.

Humans are accelerating ecological change. We remove established species, introduce new species, divert the flow of water, manipulate the topography and alter the ingredients of our soils. In doing so, we are rapidly changing the playing field for life in Texas. Some species are benefiting from these changes, while others are losing ground. We optimistically expect our native species to keep up.

We plowed the prairie and, in doing so, eliminated habitat for the greater prairie-chicken and the crawfish frog. We built reservoirs and ended up attracting flocks of double-crested cormorants. We planted trees in Lubbock and created habitat for the eastern gray squirrel.

As an observer, understanding the nature of change is difficult. In our short lives, we see only a snapshot of time. The arc of change is incomprehensible from our personal experience. Even as we accelerate ecological change, the impact of our actions today may take generations to play out.

Some of these changes have had negative consequences. Zebra mussels, for example, have clogged our waterways and caused declines in fish and native mussels. In other cases, too, new arrivals have disrupted ecosystems and displaced native wildlife.



Common porcupine

PHOTO © RUSSELL A. GRAVES, TOP PHOTO © SETH PATTERSON

It's difficult to untangle the web of cause and effect that led to the mix of species we see today. Tragically, iconic species that once defined the character of natural regions have been lost not only from the landscape but also from the collective memory of generations of Texans. Wild bison and gray wolves are gone; it's possible that ocelots and the Houston toad won't survive into the next century. This loss of our authentic heritage fuels fear of change and fear of a future devoid of ingredients that are uniquely Texan. However, change is also part of the beauty of nature and certainly a key ingredient of the nature of Texas.

Many established non-native species are integral to the Texas experience that future residents will know and love, such as the armadillo. More species will come, brought by humans or arriving of their own volition, and some of these species will also become part of the nature of Texas. The future will look different, but it need not be bleak.

It's an interesting problem for those working in the conservation field. Isn't conservation by definition focused on preventing change, on preserving what's here now?

"That's the challenge," Oldenburger says, "coming to a consensus on where to allow change to happen."

Today's conservationists face the complex task of not freeze-framing an ecological status quo but instead seeking to protect and perpetuate dynamic and ongoing wild processes in which rivers flow, rocks erode and species come and go. Conservation must aim at a moving target.

We've chosen three species — the armadillo, the Rio Grande chirping frog and the white-winged dove — to help illustrate our changing world.

ARMADILLO

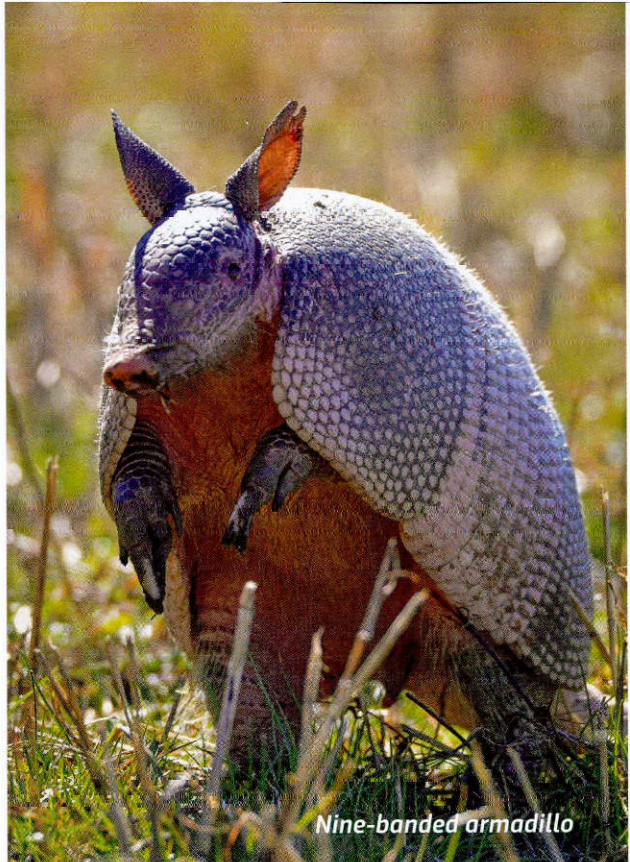
Few species of mammal have more Texan credibility than the official state small mammal, the nine-banded armadillo. Yet many people don't know that it is a newcomer, a colonizer from Mexico.

"Armadillos play a significant role in our culture," says Jonah Evans, TPWD mammalogist. "They're iconic."

When Texas declared its independence in 1836 the closest armadillo may have still been in Mexico. Armadillos were first recorded in South Texas in 1849. By the early 1900s they had expanded to the Austin and San Antonio regions, and by the 1950s they had staked claims across East Texas. By the 1970s, our little armored friends were found in Oklahoma and Arkansas. "Home with the armadillo" didn't mean just Texas anymore.

After armadillos made it across the Rio Grande, they were boxed in by the South Texas grasslands. Over time, mesquite and brush began to displace the grasses because of drought, grazing, farming and fire suppression. The new woody habitat, which allowed armadillos to forage in forest litter, was more suitable for northward-bound armadillos than the grasslands.

"It's not like armadillos learned a new trick," Evans says. "The environment changed and allowed them to use the tools they have to be more successful than they used to be."



Nine-banded armadillo

PHOTO © DENNIS STEWART / NATURESR=SLIM.NET

Evans says the success of the armadillo follows a trend in determining which mammals will do well in a state where humans have reached every corner. Armadillos, like raccoons and coyotes, are generalists. They do well in a wide range of habitats, and in disturbed habitats. Specialists such as the swift fox and kangaroo rat, which depend on specific diets and habitats, tend to suffer when habitat conditions change. The generalists will continue to have an advantage in today's world.

Texas lost several mammals to extinction in the 20th century. The grizzly bear, jaguar and black-footed ferret all disappeared, largely because of human-induced changes. Other mammals experienced drastic range reductions, including the pronghorn, mountain lion and black-tailed prairie dog. As for mammals that have been spreading, porcupines and a few species of bats joined the armadillo in expanding their territory.

RIO GRANDE CHIRPING FROG

There's a hitchhiker making its way across the state. It hides out in potted plants at nurseries. It's small, typically three-quarters of an inch in length, and it doesn't need water to lay eggs. It's the Rio Grande chirping frog.

These little guys are native to the Rio Grande Valley but have been popping up and hopping around in places like Houston, Huntsville, Fort Worth and Tyler.

"The plant nursery trade is probably a pretty good mover of these guys, as well as construction material," says Travis LaDuc, curator of herpetology at the University of Texas at Austin's Biodiversity Collections.

In 1987, the frog was found in four South Texas counties. In 2000, 11 counties. Today, it has spread to 28 counties, including places in North, Central and East Texas.



Brown anole



Mediterranean gecko



Green anole

PHOTOS FROM TOP © THERESA DIMENNO; GREG LASLEY / KAC PRODUCTIONS; T—ERESA DIMENNO

LaDuc discovered the first Travis County specimen in 2013 in a debris pile across town from his home. Now he hears the frogs in his backyard.

These frogs have been thriving in places they didn't exist just a few years ago, but they didn't do it on their own. Biologists suspect that when tropical plants are shipped out of South Texas, the plants carry hidden cargos of chirping frogs. When the frogs reach their new destination, they find irrigated landscapes and plenty of places to hide. Urbanization takes a heavy toll on many wildlife species, but this one seems to do just fine in the city.

One of the unique attributes of the Rio Grande chirping frog is that it doesn't need water for reproduction. Its young do all their development inside the egg, emerging as little froglets, instead of developing from larvae to tadpole to frog in a pond or other body of water.

"That really facilitates their ability to move around," LaDuc says.

Biologists aren't completely sure how the frogs are interacting in their new environments — whether they have found their own niche or are competing with other species.

The Mediterranean gecko, a non-native that has firmly established itself in Texas, moved into a niche with little competition.

"There's no other nocturnal lizard that lives on vertical surfaces in Texas," LaDuc says.

However, the brown anole, an introduced lizard species spreading in Texas, has been pushing out a native, the green anole. When the browns move in, the greens are forced to move further up the canopy.

WHITE-WINGED DOVE

The white-winged dove is a relative newcomer to our urban areas, but it has come to love the city life.

"These birds do really well in cities," says Cliff Shackelford, TPWD ornithologist. "There are lots of canopy trees and plenty of water — and bird feeders. Sometime in the 1980s, they exploded in San Antonio and Austin and started marching northward, triggered by urban development."

For generations, these were country birds, occupying Rio Grande Valley brushlands and serving as an important game bird for hunters.

What happened? With conversion of their native brushlands to farming and with freezes to citrus groves where they nested, their population was in decline.

In the 1950s, the situation was so dire for the birds that TPWD established the Las Palomas Wildlife Management Area in large part to protect white-winged doves. At some point, white-winged doves learned to live in urban environments. Now the white-winged dove population in Texas is nearing 9 million.

"No one would have ever guessed that," Oldenburger says of the rapid expansion.

Urban and suburban development attracted the birds

to a habitat of neighborhoods lined with shade trees and filled with backyard feeders.

"Every city they hit, they found what they needed," Shackelford says.

Their northward spread has been fast and remarkable. Texans from San Antonio to El Paso to Wichita Falls now can hear the white-winged dove's *whu-cooks-for-you* cooing outside their bedroom windows.

Another resident of the South Texas brushland, the great-tailed grackle, has found similar success in cities. The grackle has readily adapted to human changes in the landscape, to the dismay of many who have parked their car under a grackle-filled tree.

Monk parakeets love the cities, too. Originally from South America, they were introduced to Texas by the pet trade and are thriving in urban areas. They make their nests in stadium lights and power poles and delight many Texans with their bright green plumage.

None of these birds — the grackles, doves and parakeets — are native to Houston, San Antonio, Austin or Dallas, but now all three are part of the fabric of our cities.

CHANGING SPECIES

By documenting where species are today, and comparing today's information to data collected by previous generations, we can start to see the arc of change in our natural world. Programs such as iNaturalist, eBird and TPWD's Texas Nature Trackers invite the public to participate in recording where species currently exist. The naturalists a century from now will have a much clearer view of the ecological change we are participating in.

By documenting plants and animals, Texans can help the conservationists of today and of the future be good stewards of wild plants and animals. Through informed stewardship, we can do our best to provide our native species a path into the future and make sure future generations inherit a natural world that is more abundant, resilient and diverse.

It can be difficult sorting out everything involving natives, non-natives, invasives, climate change, urban expansion, habitat destruction and all else going on in the human and natural worlds.

As more and more people move to Texas and lay an ever-heavier hand across the landscape, affecting wildlife and plants in increasingly dramatic ways, aren't humans the species that needs to be held in check?

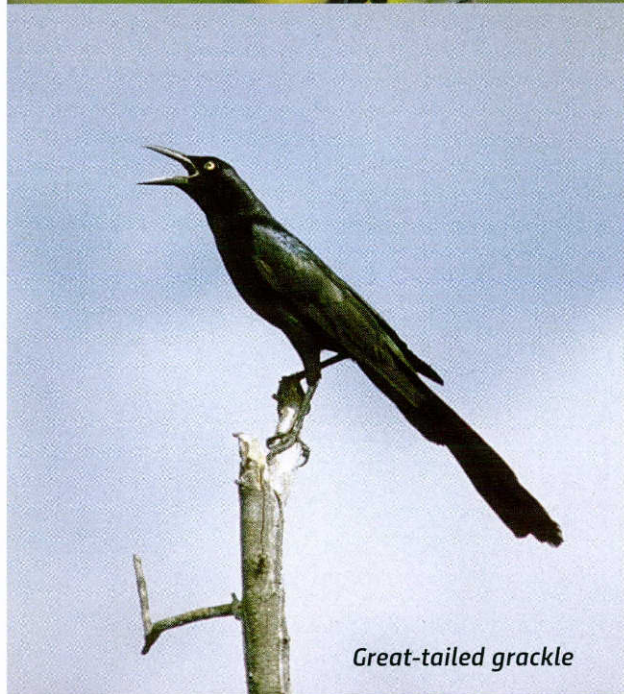
Robin Doughty, a professor of geography at the University of Texas, isn't so sure.

"We have the ability to be very creative as well as destructive," he says. "We are part of the system. I don't like thinking of us as an invasive species — it doesn't sit right with me. I rather see us as co-creators, intelligent beings who can recognize and value and trust nature, and watch it. And adjust. We need to adjust. We're not good at that."

Russell Roe is managing editor of Texas Parks & Wildlife magazine. Cullen Hanks is a former TPWD biologist now at Cornell University.



White-winged dove



Great-tailed grackle



Monk parakeet

PHOTOS FROM TOP © GRADY ALLEN, TPWD; ROB CURTIS / THE EARLY BIRDER

*To understand
Woody Welch's
relationship with the
Guadalupe River —
stretches of which
he has canoed,
swum, snorkeled,
whitewater-rafted
and photographed
thousands of times
over the past 29
years — you must
first get to know
this river man
who builds his life
around a sacred
connection to water.*





WOODY

ON THE GUAD

Photographer channels his passion for a wild river into imagery.

By Camille Wheeler
Photography by Woody Welch

On a trip down the Guadalupe River, photographer Woody Welch explores a stairstep waterfall nestled between boulders and bald cypress trees.

PHOTO © CAMILLE WHEELER



Around it, in it, on it, under it — it's the most connected I can be," says Welch, a 48-year-old New Braunfels-based commercial editorial photographer who has captured close to 50,000 documentary images of the Guadalupe River: a magical place of springs, waterfalls, rapids and jade-green water that for Welch evokes J.R.R. Tolkien's fictional setting of an elven Middle-earth realm, a Texas Rivendell.

He'll never forget the first time he heard the ghostly sound of bald cypress trees creaking and croaking beside the Guadalupe at night.

"Where are the fairies and the elves?" he remembers thinking, "I feel like they come out when we're not looking and pour their magic potion in the water."

Welch's path to the Guadalupe came through its tributary, the San Marcos River, which he first saw as a high school senior on a 1987 spring visit to Southwest Texas State University (now Texas State University) in San Marcos. Welch, who swam in creeks and lakes every chance he got growing up in the Dallas suburb of DeSoto, loved water.

But the scene that Welch witnessed from University Drive overlooking the San Marcos River, where he and a friend were stopped at a red light, changed his life in an instant. Welch looked upstream and saw people jumping off a restaurant roof into a waterfall. He saw students springing off riverside diving boards.

Most riveting of all, Welch saw a diver emerge from the river, holding a huge, freshwater prawn on the end of his spear.

"I was just astonished," Welch recalls. "I was like, 'What? A lobster?'"

Three decades later, Welch paddles the Guadalupe as often as he can, with his camera handy.

Shooting film and digital, in color and black-and-white, Welch chronicles the juxtaposition of life and death, flood and drought, pristine ecosystems and residential and industrial development on the Guadalupe. These photos form the backbone of Welch's *One River* book project, a work in progress as he makes tentative plans to canoe the Guadalupe's total 250 miles later this year.

"I'm not just going down the river, I'm studying it," says Welch, whose photos document environmental changes along Texas' most popular recreational river.

Welch rarely takes pictures from the river's banks. Rather, as an expert canoeist, powerful swimmer and both a certified whitewater raft guide and underwater diver, he uses those skills to photograph the Guadalupe from every conceivable angle.

Welch is fond of jumping into the Guadalupe from a canoe, camera held high over his head as he swims or navigates chest-deep water. Yes, he occasionally drops a camera into the river.

"I'm friends with my insurance agent," he laughs.



The drought of 2011-2015 caused cypress trees to struggle and the riverbed to dry up.

FROM DROUGHT TO RIVENDELL

Welch has long dreamed of the ultimate Rivendell setting: the wild Guadalupe hundreds of years ago where waterfalls surround waterfalls in the most fantastical of settings.

During an overnight camping trip on the Upper Guadalupe River above Canyon Lake in late February, Welch saw that dream come true in the company of two fellow canoeists: me, the rookie paddler and writer chronicling his relationship with the Guadalupe; and his friend Wynn Wallace, who has accompanied Welch on many an outdoors adventure.

Above-average rainfall over the past two years had recharged the Trinity Aquifer, filling its underground karst system to the brim. The river's strong current grabbed our canoes as soon as we put in at the Berghheim Campground, near FM 3351.

It was hard to believe that during drought conditions spanning from 2011 into 2015, virtually all of the nearly 20-mile stretch we were set to paddle — from near Boerne to just shy of Canyon Lake northwest of New Braunfels — was bone-dry.

Welch's September 2013 photos taken here reveal haunting images of death: An alligator gar skeleton rests on a rock. A raccoon carcass lies near a puddle. Bald cypress trees display survival-mode dormancy, their leaves turning an unnatural shade of orange.

One photo shows Bigfoot Canoes business owner Wendall Lyons standing in a bone-dry riverbed, his 6-foot-4-inch frame well below the top of a bald cypress tree's fully exposed root system.

"It's hard to conceive of a river disappearing," says Lyons, who had to turn away people who wanted to paddle a river that didn't exist.

But on February 22, as Welch, Wallace and I set forth, the roar of our first whitewater sounded like jets taking off. Welch, from the back of our canoe, pulled us over to scout Rock Pile Rapid and to drop me off on the shore.

There was plenty of whitewater to come, with ample opportunities for me to practice my J-stroke.

From about 30 yards downstream, I watched Welch, then Wallace, come flying through the rapid in their canoes. They paddled swiftly as their boats slid to the right of an exposed boulder.

With my own life jacket buckled tight, Welch gave me permission to paddle the next rapid, repeating the instructions he'd once given as my guide on a Lower Guad whitewater rafting trip.

"If your paddle's not in the water, it's useless," he said. "As a matter of fact, it's a liability. You need to always be looking for the next place to grab, OK?"

"OK," I replied, not realizing just how important those instructions would later become. But on this rapid, my heart racing as the sound of rushing water filled my ears, I listened.

"Pull hard, pull hard, yeah!" Welch shouted as we dropped into the rapid. "Keep that paddle in the water! That's the way to do it! OK, paddle up. Turn around and watch Wynn ..."

As we watched Wallace come through, I realized how dramatically the landscape was changing. Hilly terrain gave way to steep, cave-pocked bluffs. Awestruck, we took in the geologic wonder of a travertine waterfall tumbling hard and fast down a limestone cliff. The cold water looked impossibly smooth on the algae-free rock, as though the water were made of glass.

"It's hard to believe it's real," I told Welch, who shot me a grin from beneath his oversized straw hat.

"It's Rivendell," he said.



We fell into the rhythm of the river, running rapids and gliding through calm stretches, marveling at unending series of springs, waterfalls and maidenhair ferns growing like carpet in limestone seeps.

Welch had witnessed many similar scenes on the Guadalupe. But something about this trip felt different. The rapids seemed to roar louder. The sun seemed to shine brighter. The waterfalls seemed to flow from all directions. Everything, Welch said, seemed to be heightened.

Near dusk, we reached Guadalupe River State Park, near our campsite. Welch put forth a theory: Around the next bend, the sun would shine on an exceptionally special spot. He was right.

OVERBOARD IN A RAPID

Mist rose from the Guadalupe River in the early morning light.

Spring water gushed down a limestone cliff, cascading over boulders to form a stair-step waterfall directly across the river from where Welch's braided hammock hung between two bald cypress trees. Massive tree roots rose like thrones on the river's banks.

The night before, we had fallen asleep to the yipping of coyotes and the lullaby of rumbling rapids. This winter morning, while Wallace warmed himself beside the campfire, Welch paddled the canoe across the river to the waterfall.

Welch gently touched the waterfall with a wooden paddle, taking care to cause no damage as he stepped out of the canoe, balancing on tree roots and raising his camera to capture an artistic shot of the waterfall, canoe and paddle. As if on cue, golden shafts of light shone on the scene.

It was classic Welch, who goes to any lengths to nail a shot.

"He lingers," said Wallace, the subject of many of Welch's photos on this trip, following his directions to paddle this way or that. "He'll drive you crazy, but he lingers."

The mist lifted. We broke camp and headed out, enjoying a morning of abundant wildlife, spotting kingfishers, great blue herons, wild turkeys and a buck with an enormous rack.

We reviewed canoe-paddling basics: In a rapid, don't try to switch sides — use a J-stroke to keep the boat traveling in a straight line. Hit big water head-on. Lean on your paddle, using the water's power to keep you squarely seated.

"Hopefully, you're perfect in times when your life's in danger," Welch said. "Practice falling out as much as you can."

That practice came much sooner than I would've preferred. I felt confident as we entered a long rapid. We dropped into the heart of the run, whooping as the river sped up.

Suddenly, the waves loomed bigger. The canoe felt heavier. We were taking on water.

"Grab that water!" Welch yelled at me. "Grab it! Grab it!" A big wave reared in front of me.

"Huh," I thought. "That wave looks different."

It looked strange. Diabolical. I didn't know if I was paddling. It felt like I was floating. The wave swamped us, turning the boat sideways and dumping me out on the left side.

I went under, coming back up and gasping for air in the shockingly cold water. Thoughts flooded my confused brain: "Don't die. Remember what Woody has taught you. Keep your feet up. Float like a stick on the water's surface. Remember that guy Woody told you about, who fell out of a boat in a rapid and tried to stand up. His feet got trapped between rocks on the river bottom. The current overpowered him. No one could get to him in time. He drowned."

Through my confusion, I heard Welch's voice.

"Ride it out! Grab the boat! You OK?"

I was OK. And so was Welch, swimming beside the capsized canoe and guiding it to the shore. Wallace, behind us, took on water but made it through the wave. He recovered our gear, including my paddle. Welch poured the water out of the canoe, and we climbed back in.

Welch didn't coddle me. "That's when we've got to have the paddles in the water," he said, explaining that I had stopped paddling and backed away from the wave in fear.

Welch allowed that he'd never seen that rapid at that height, with a 4-foot wave breaking over a submerged boulder and curling sideways.

"This is a really rare thing we witnessed on this trip," he said.

But remember, Welch said, always expect the unexpected: "If you want predictable, go to Schlitterbahn. You can't count on a wild river."



A RIVER MAN'S PATH COMES FULL CIRCLE

Welch's path to water begins at his New Braunfels home that sits between the Guadalupe and Comal rivers.

About once a week, Welch and River Dog, his blue heeler, go swimming in the Comal, with River Dog pulling Welch there on his bike. If River Dog's toenails are too long, Welch knows it's been too many days since they've been on the river.

River Dog's toenails *click-clack* on the riverbed path in Welch's backyard. Made of limestone rock from the Guadalupe, the path breaks into tributaries that wind through fruit trees and vegetable gardens.

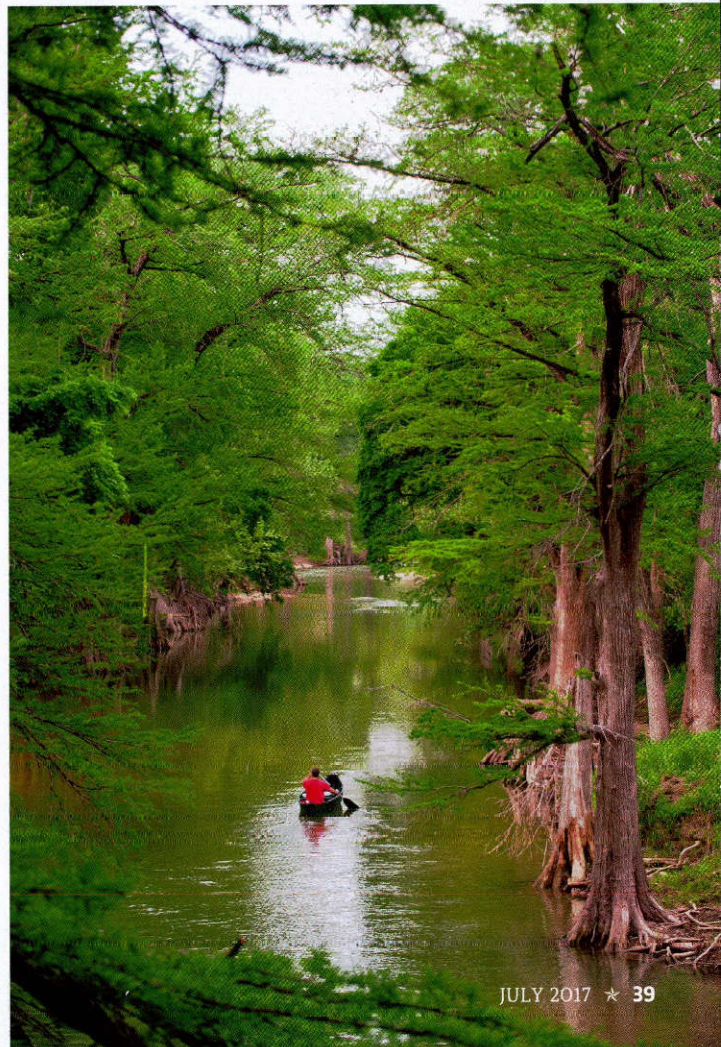
Welch, a certified permaculture designer and teacher, designed the pathways to mimic the Guadalupe's riverbed. Permaculture, Welch explains, is all about flow, just like the river.

In turn, Welch's life comes full circle, time and again, to the Guadalupe as he makes plans to canoe the entire river, from its beginnings in Kerr County to the Gulf of Mexico at San Antonio Bay.

Welch used to beat himself up because he hadn't yet taken the trip. Now he realizes there's a reason he waited. For years, he's been reading the river, learning its ecology and geography.

Welch is now better able to analyze the river on which he's comfortable paddling by day or night. On the Guadalupe, Welch says, "It's the closest I feel to heaven and the most connected I feel."

Camille Wheeler, an Austin-based freelance writer, is collaborating with photographer Woody Welch on his "One River" book project about the Guadalupe River.





NATURAL PLAY

Goodbye, big structures. Hello, dirt and sticks. **Old-fashioned fun is back in style.**

BY JENNIFER BRISTOL

Remember what it felt like to roll down a grassy hill for the first time? You laughed as the world went spinning by, then you couldn't wait to run back up and roll down again. Did you ever catch a firefly in a jar or squish gooey mud between your toes?

Remember what it felt like as a child to just play outside?



MY BROTHER AND I had an elaborate network of forts strewn across miles of woods surrounding our home in 1970s Austin. Today those woods, like so many others across the nation, are filled with houses and the trappings of progress. The children growing up there no longer have access to the wild places my brother and I once explored, but today's kids can still have a nature-rich, playful childhood.

A nature play revolution is sweeping the nation, and Texas is leading the charge. Anarchy zones, natural play areas, play leaders and "pocket" trails are just some of the innovations being deployed to encourage more active play outside — and not just on "traditional" equipment like slides and swings in huge structures.

Natural playscapes are designed to give children a sense of place and a connection to nature while fostering active, imaginative play. Childhood development leaders, architects, educators and urban planners have worked in tandem to create plans for these inventive spaces. One man, Joe Frost at the University of Texas College of Education, led the charge by championing the movement for three decades. He teamed up early with the Children in Nature movement to expand his message beyond educators: Play is the work of children, and, through play, learning occurs.

"We can create extraordinary places for children to discover themselves and the world around them," writes designer Rusty Keeler in *Natural Playscapes, Creating Outdoor Play Environments for the Soul*. "We can create places for children that tickle the imagination and surprise the senses. But first we have to remember the places and spaces of our own childhood."

Texas state parks are joining in the fun, opening new natural play areas at Mother Neff State Park and Government Canyon State Natural Area, with others soon to follow. Zoos in Texas' big cities are embracing the concept and engaging in a friendly competition to create the best natural playscapes.

The authors of *Nature Play & Learning Places*, Robin Moore and Allen Cooper, tell us that children deserve amazing spaces to play, explore and connect with nature. Gone might be the days of exploring the deep woods all day, but that doesn't mean kids have to stop building forts, climbing trees or engaging in imaginative play.

The *Nature Play* guidelines offer park administrators, school staff and parents methods for installing safe and manageable natural play environments. Unlike the industrial style playscapes seen worldwide, these new playgrounds are constructed with natural materials. They fill children's senses with the smells of native plants and allow them to craft forts from sticks. Small hands can turn mud and stones into a "gourmet meal" in an old pan. Busy minds slow down for daydreams as the wind drifts through the leaves of a sycamore tree.

Are you starting to remember? Here are a few elements found in natural playscapes.



PHOTO BY EARL NOTTINGHAM / TFWO

Mother Neff State Park
nature playscape



PHOTO BY CHASE FOUNTAIN / TFWO

Hana and Arthur Ginzburg Nature
Discovery Center, Houston

Mud Play

Follow the laughter and squeals of joy to the mud "kitchen." A cluster of old pots, a bucket of water, a little dirt and pans stacked on top of a log are all it takes. Children can come up with their own storylines as they pour mud into pots and pans to make pies, donuts or even a birthday cake. Ready to take mud play to the next level? The San Antonio Zoo's International Mud Day (June) encourages kids to create mud art masterpieces and slide tummy-first across a muddy slip-n-slide.

Hill Slides

Six-year-old Jose rolled down the gentle grass slope so many times that his mother declared, "My son has turned into a log!" Undeterred, Jose throws himself down the hill again with a hearty "Tim-berrr!" Kids can choose to play on the grass slopes of the hill or slide down the two blue slides on the other side at the play area of the Oso Bay Wetlands Preserve in Corpus Christi. Active play exercises like running up the hill, rolling down it and jumping up to do it again all help develop a child's gross motor skills.

Clubhouses Rule

A group of girls dominates the top of the fort at the Donovan Park play area in Houston. Three fathers watch from the shade as the girls defend their imaginary kingdom from a roving pack of boys. One bold girl yells out new terms to the boys as they expand their game. Clubhouses and forts give children a sense of place where they can explore their imagination through active or dramatic play. A final yell of "We take no prisoners!" is given as the girls burst from the wood structure to descend upon the boys.

Sand is Back

There was a time when sandboxes and the like were removed from playgrounds, but sand is back and here to stay in nature play. The majority of the surface material at the Barbara Fish Daniel Nature Play Area in Houston's Buffalo Bayou Park is sand. Beside the big log bench, an older boy shows his little sister how to make a sand angel by lying on her back and waving her arms across the soft white sand. At the Austin Nature and Science Center Dino Pit, kids can dig in the sand for fossils or discover hidden dinosaur tracks.

DISCOVER A NATURAL PLAY AREA NEAR YOU

Mother Neff State Park
nature playscape

Mother Neff State Park

Lady Bird Johnson Wildflower Center
in Austin

San Antonio Botanical Garden

San Antonio Zoo

Government Canyon State
Natural Area

Houston Zoo

Barbara Fish Daniel Nature Play
Area in Houston

Hana and Arthur Ginzburg Nature
Discovery Center in Houston

Rory Meyers Children's Adventure
Garden at the Dallas Arboretum

Find more places to play, explore
and connect with nature in your
community at NatureRocksTexas.org.

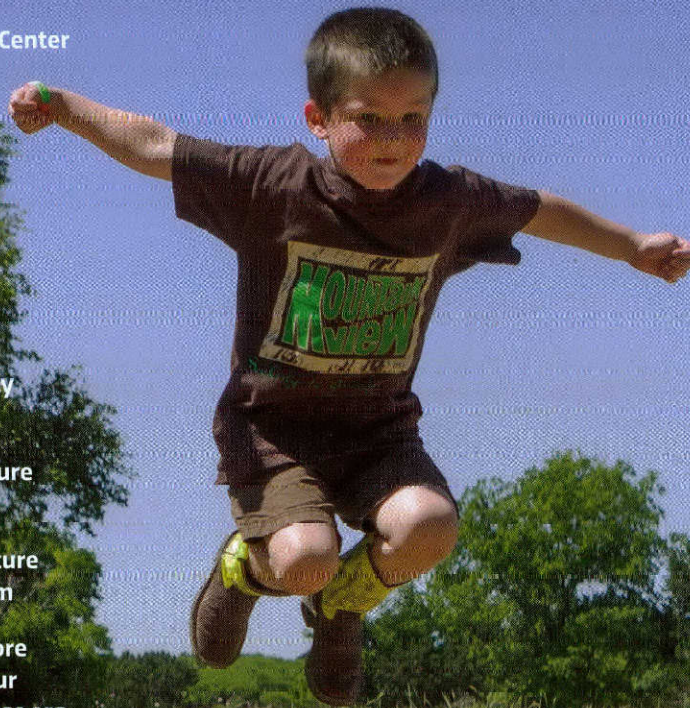




PHOTO © KATYA HORNBER / COURTESY OF BUFFALO BAYOU PARTNERSHIP

Barbara Fish Daniel Nature Play Area, Houston



PHOTO BY CHASE FOUNTAIN / TPWD

Barbara Fish Daniel Nature Play Area, Houston

Scaled Trails

Play equipment designer Playcore and the National Learning Institute came up with a method for building trails that are scaled for children with all abilities. At the new Discovery Trail at Government Canyon State Natural Area, children go bolting by along the all-weather trail to one of the "pockets." Each pocket along the pathway encourages them to explore, learn, imagine or play. Many of the other trails at Government Canyon are too long or too rocky for small children, but the new trail is just right.

Anarchy Zones

Designer Rusty Keeler coined the term "anarchy zones," and to some people, the play area looks as chaotic as the name. Children are given an assortment of "loose parts" like sticks, old tents, a mound of dirt, a bale of hay, a pile of smooth rocks or other objects. Children agree to some simple safety guidelines, then create whatever inspires them. Sticks and an old tent are fashioned into a fort by one group of children, and another group turns the rocks and dirt into a fairy garden. The City of Austin Parks and Recreation Department invested in a loose parts trailer so it can take the anarchy zone to various parks around the city.

Quiet Time

Natural play areas can also have spaces where children can feel calm and safe: a pollinator garden where kids can watch butterflies flutter about the flowers, a big shade tree ringed by carved stumps to sit on for story time, a calming stream nestled into a shady garden. Each feature gives children a time to peacefully enjoy nature on a scale that is comfortable for them.

Play Leaders

Play leaders can be park staff or volunteers who facilitate outdoor play. At the San Antonio DoSeum, a friendly man in his early 20s introduces a group of children to the manmade stream in the play area. He shows them how it works, then steps back and allows the kids to create dams to channel the water, have a race using leaves as boats and splash in the shallow creek. He steps in for a split-second to offer a safety tip, then retreats to his watchful station under the tree.



PHOTO BY CHASE FOUNTAIN / TPWD

Water Works

Water is always a fun element for play in Texas. The family garden at Austin's Lady Bird Johnson Wildflower Center replicates the Texas Hill Country with a waterfall, complete with a secret hideaway cavern and shallow wading spot. The experience of water doesn't have to be complicated or costly. Up the fun a notch by combining the water with sand.

Sensory Gardens

Megan, age 4, leans in close to the bluebonnets to take a deep breath. "What does it smell like?" her grandmother inquires. "Bubbles!" she shrieks, pointing at a butterfly floating away on the wind. The Lady Bird Johnson Wildflower Center specializes in creating tantalizing spaces where children can explore their senses. Megan holds her tiny hands to her chubby cheeks as she comes close to the sound of the waterfall at the center of the Wildflower Center garden. It's easy to connect with our inner child and feel the same joy and wonder as she does.

Jennifer Bristol is the Texas Children in Nature coordinator.

Government Canyon's New Playground

IT'S ONLY FITTING that the largest urban state natural area in Texas should have a natural playscape. The Friends of Government Canyon State Natural Area raised more than \$100,000 to install a new all-weather play area and trail.



PHOTO BY TPWD

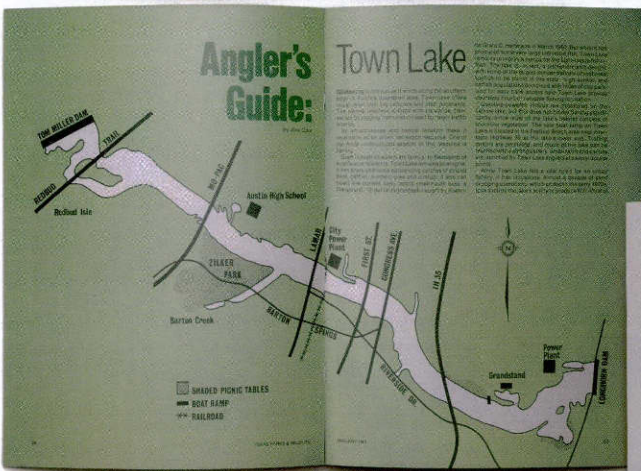
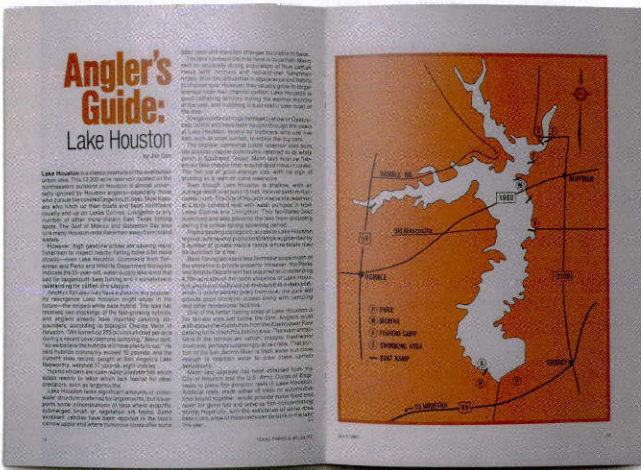
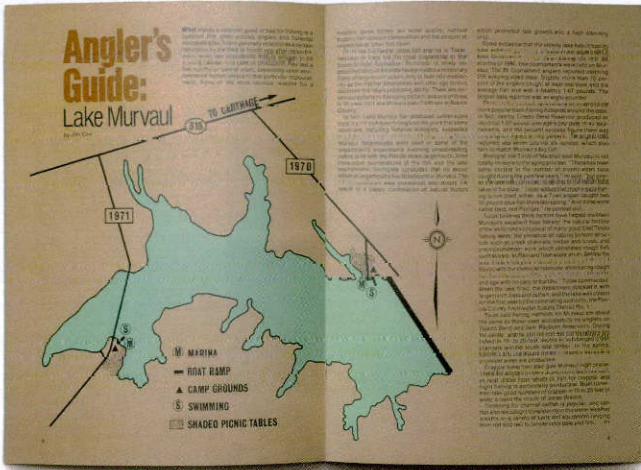
"Since we're a state natural area and not a park, we were motivated to provide something that was not the typical swings-and-slides playground, but rather something that would engage children in more of a natural-type setting," says Park Superintendent Chris Holm.

The new Nature Playscape and Discovery Trail are also built to the Americans with Disabilities Act standards so children with all abilities can enjoy them. Government Canyon is known for its miles of hiking and biking trails, but it is often closed after a large rain event. Children and families can still enjoy the Nature Playscape and Discovery Trail after a storm because they are all-weather features.

"One of our primary motivations was diversification of recreational opportunities for all ages and abilities," Holm says.

Looking back at... THE 1980s

The 1980s began with a Texas mystery for the ages. Who shot J.R.? The TV show *Dallas* tantalized America over the summer of 1980 with a nail-biting cliffhanger involving the villainous oilman. America's infatuation with Texas intensified that summer with the release of the movie *Urban Cowboy*, which kicked off a national boot-scootin' craze and a wave of cowboy wannabes. 1980 proved momentous in other ways. Ronald Reagan was elected president, ushering in an era of conservatism, and the video game *Pac-Man* was released, giving people a reason to stay indoors instead of enjoying the great outdoors. The Texas Parks and Wildlife Department was doing what it could to make the outdoors the place to be. The department was in the middle of its "golden age" of park acquisition, obtaining Choke Canyon, Colorado Bend, Franklin Mountains and Lake Tawakoni state parks, among others. The moves were capped by the 1988 acquisition of Big Bend Ranch, which at one time was among the biggest working ranches in Texas. All hat and no cattle? Please.

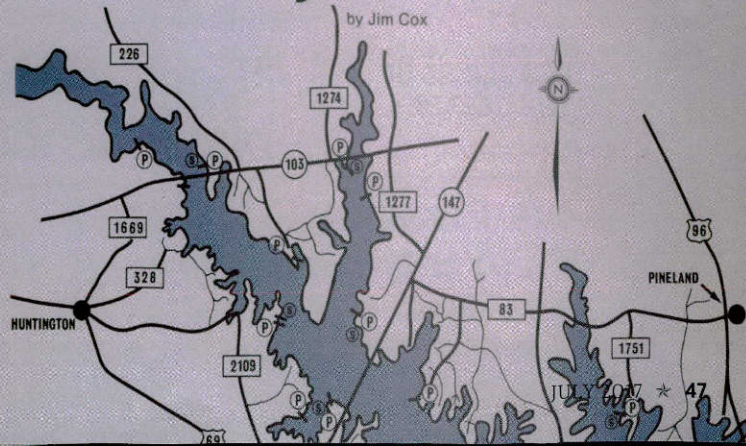


WHERE THE FISH ARE

JANUARY 1981 - JULY 1981

Texas anglers could look to the magazine for maps and fishing information in the pre-Internet '80s.

Angler's Guide: Sam Rayburn Reservoir



A TIMELINE OF THE TEXAS OUTDOORS

1980
Red wolves are declared extinct in the wild after the last ones are rounded up in Southeast Texas and put in captivity

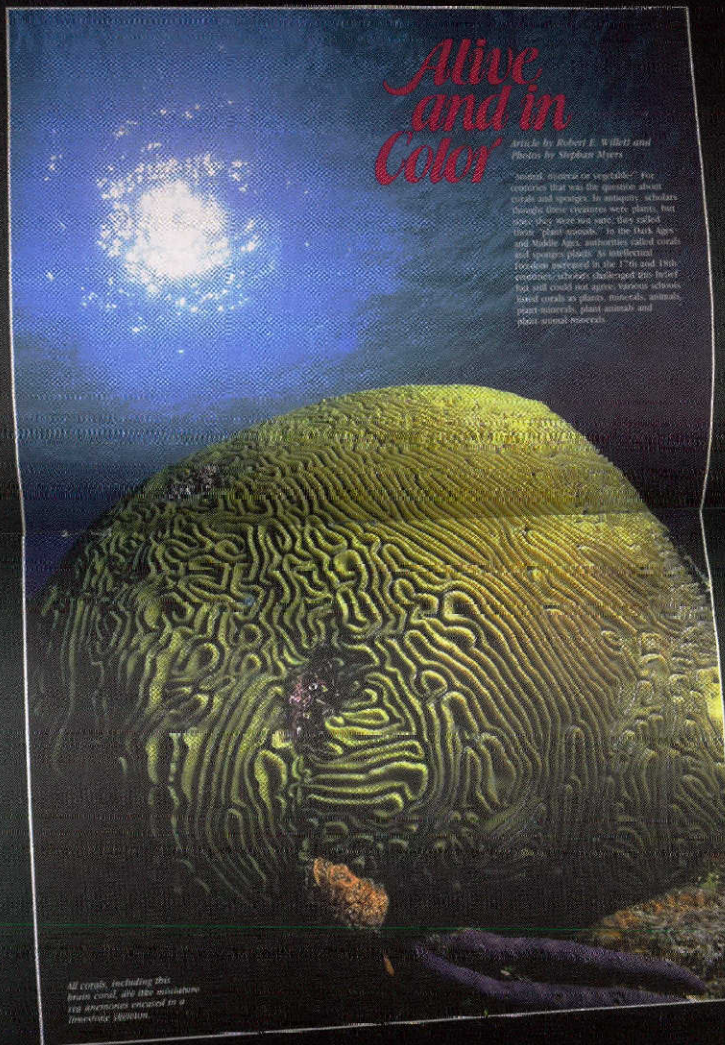
Operation Game Thief

1982
Operation Game Thief, the state's wildlife crime-stopper program, begins operations.

LOOKING FROM A DIFFERENT PERSPECTIVE

FEBRUARY 1987

When photographers go deep, sometimes the best way to display the image is to go tall.



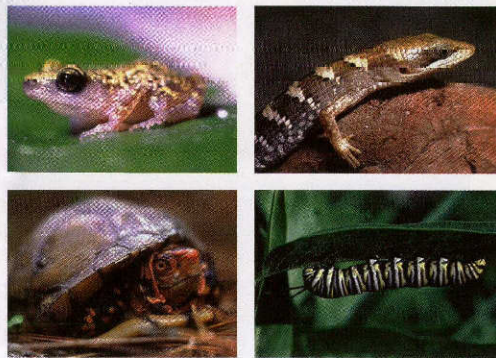
Alive and in Color
Article by Robert E. Whitt and Photos by Stephen Myers

"Reef, coral or spectacle." For centuries that was the question about coral and sponges. In antiquity, scholars thought these treasures were plants, but today they're known as the "plant animals." In the Dark Ages, medieval scholars called coral and sponges plants. In medieval London, seaweed in the 17th and 18th centuries always challenged the belief that coral was a plant. Various scholars listed coral as plants, minerals, animals, proto-animals, plant animals and proto-animal minerals.

All corals, including this brain coral, are the animals that Americans mistake for a mineral.

THAT'S RIGHT, WE SAID IT...

Nature is trying to teach us something, but we simply don't listen. Outdoor and wildlife photography makes us listen."



RECIPES: ART OF A WELL-COOKED MEAL

NOVEMBER 1981

A six-page illustrated wild recipe section arrived just in time for Thanksgiving 1981.



Turkey

Roasting is the traditional way to prepare turkey, and roasted turkey with corn and dressing seems to be most people's favorite. Roast the turkey at 325 degrees for 25 minutes per pound, basting with oil, butter, and drippings from the pan. Save leftovers; one wild turkey can provide several different types of meals.

Turkey Pie
2 r. cooked wild turkey, chopped
1 pkg. frozen mixed vegetables, cooked and drained
1/2 tsp. salt
1/8 tsp. pepper
1 can condensed cream of chicken soup

Pastry
1 1/2 c. flour
1 tsp. salt
1/2 c. shortening
3/4 c. uncooked oats
8 to 9 tbsp. water

Preheat oven to 375 degrees. Combine filling ingredients and set aside. To make crust, sift together flour and salt. Cut in shortening until mixture resembles coarse crumbs. Add oats and mix lightly. Add water one tablespoon at a time until pastry forms a ball. Divide dough in half. Roll out half on a lightly floured board to form a 13-inch circle. Fit loosely into a 9-inch pie plate. Fill with turkey filling. Roll out other half of dough to form a 12-inch circle. Make a few narrow slits in the center for steam to escape and place over filling. Trim, turn edges under and flute. Bake approximately 40 minutes until top crust is brown.

THERE'S UGLY AND THEN THERE'S

Catfish Ugly

by Russell Tinsley

JULY 1985

NOVEMBER 1986

HEADLINES OF THE DECADE

OCTOBER 1988

"Look, Bubba, it's a black-headed oriole!"

A good quail gun is a joy forever

"Educate the kids and catch their daddies."

JUNE 1981

1983

The Texas coast experiences freezes that kill 14 million fish and 1 million invertebrates.



1985

The TPWD television series *Made in Texas* debuts on PBS.

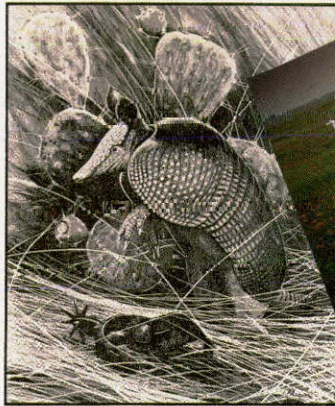


1986

The ShareLunker program is launched when a 17.65-pound bass is caught at Lake Fork.

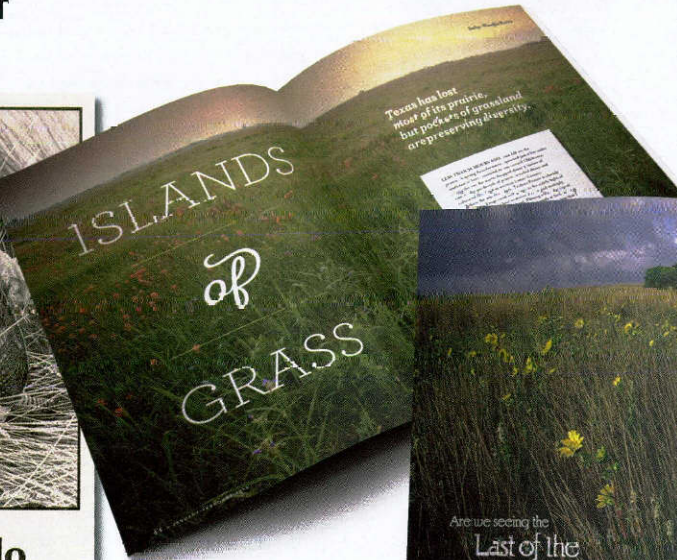
WHO DOESN'T WANT A 'DILLO POSTER?

NOVEMBER 1982



Get the 'dillo when you give

For every two-year gift subscription we'll send the donor a full-color, 16-by-20-inch armadillo poster. It's ready to frame for home or office - and available only when you add a gift of TEAS PARKS & WILDLIFE (Treat yourself to a two-year subscription and we'll also send you a poster.) See the color ad elsewhere in this magazine. (allow six weeks for processing subscription and poster)



THEN AND NOW: PRAIRIES

AUGUST 1985 AND JANUARY 2015

Protecting the native Texas grassland prairies has been an ongoing effort for more than three decades.



WATCH WHERE YOU'RE POINTING THAT THING!

OCTOBER 1983 (LEFT); MAY 1986 (BELOW)

While the illustrations may be humorous, gun safety is serious business.

Turkey and Broccoli au Gratin

2 pkgs. frozen broccoli	1/3 c. sherry
5 tbsp. butter or margarine	Salt and pepper
6 tbsp. flour	Worcestershire sauce
2 c. turkey or chicken broth	3 c. cooked turkey
1 c. evaporated milk	Grated Parmesan cheese

Cook broccoli until tender according to package directions. Drain. Arrange in a greased, shallow baking dish. Melt butter and stir in flour. Add turkey stock, milk and wine. Cook, stirring constantly, until mixture is thickened and smooth. Continue cooking and stirring for two or three minutes. Season to taste. Lay pieces of turkey over broccoli in baking dish. Cover with cream sauce. Sprinkle generously with Parmesan cheese and bake at 400 degrees about 20 minutes.



State Park Trivia Quiz

by George Oxford Miller

Most Texans live less than an hour's drive from one or more state parks. The Texas Parks and Wildlife Department operates more than 120 facilities, including parks, recreation areas, natural areas, historical sites and structures and fishing piers. The parks have something to offer each of the approximately 29 million people who visit them every year.

State parks preserve examples of the wide variety of Texas scenery, from swamps to deserts, forests to prairies and mountains to seashore. The rich historical heritage is also represented with Spanish missions, frontier forts, Indian culture, grand houses and relics of pioneer life. Many parks are located on rivers and lakes and are dedicated to providing water-oriented recreation.

How familiar are you with the gems in the state park treasure chest? Take the following quiz to test your knowledge of what Texas parks have to offer.

Questions

1. What state park is located in the "Sahara of the Southwest?"
2. Where was the last major Indian battle fought in Texas?
3. What state park is on the largest naturally formed major lake in Texas?
4. What was the first state park?
5. What state park commemorates the first Spanish mission in Texas?
6. What park preserves more than 100 dinosaur tracks?
7. Where would you go to see the "Lost Pines?"
8. What park is the headquarters for the official state longhorn herd?

9. What is the smallest state park?
10. What two parks preserve ancient outdoor art galleries in the Southwest?
11. What park offers visitors a railroad ride into the past?
12. What park is the northernmost breeding grounds for the rare and threatened golden-cheeked warbler?
13. What is the only floating state park?
14. What state park is underground?
15. What group purchased Enchanted Rock and held it until the state could buy it for a park?
16. What park preserves the largest coastal live oak in the nation?
17. What state park offers air boat rides, canoe trails, observation blinds and camping platforms in a marsh?

18. What state park preserves the Spanish Mission Nuestra Senora del Espiritu Santo de Zuniga, built in 1749?
19. What three state parks are located on coastal barrier islands?
20. What state park has a monument taller than the Washington Monument?
21. What park features maple trees that turn spectacular fall colors?
22. What West Texas state park features a 1.75-acre, spring-fed swimming pool?
23. What two parks commemorate the birthplaces of former Presidents of the United States born in Texas?
24. What two state parks are located on the scenic Caprock Escarpment, which separates the High Plains on the west and the Rolling Plains on the east?

TRIVIAL PURSUITS

JUNE 1986

In the mid-1980s, everyone succumbed to the cultural phenomenon of Trivial Pursuit — even the editors of Texas Parks & Wildlife magazine. How many of these state park trivia questions can you answer?

ANSWERS: 1. Monahans Sandhills; 2. Palo Duro Canyon; 3. Caddo Lake; 4. Mother Neff; 5. Mission Tejas; 6. Dinosaur Valley; 7. Bastrop; 8. Fort Griffin; 9. Acton; 10. Hueco Tanks and Seminole Canyon; 11. Texas State Railroad; 12. Meridian; 13. Battleship Texas; 14. Longhorn Cavern; 15. Texas Nature Conservancy; 16. Goose Island; 17. Sea Rim; 18. Goliad; 19. Galveston Island, Matagorda Island and Mustang Island; 20. San Jacinto Battleground; 21. Lost Maples; 22. Balmorhea; 23. Eisenhower Birthplace and Lyndon B. Johnson; 24. Palo Duro Canyon and Caprock Canyons.

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Now, you can be a part of the legend. The *Legend Knife* boasts nearly 4" of famed Damascus steel with its signature, wavy pattern. Damascus steel blade knives can cost thousands. So, at \$49, the price itself is almost legendary.

Cast Damascus steel, known as wootz, was popular in the East and it's an exacting process that's part metalwork, part chemistry. It's produced by melting pieces of iron and steel with charcoal in a low oxygen environment. During the process, the metals absorb carbon from the charcoal and the resulting alloy is cooled at a very slow rate. The outcome is a beautiful one-of-a-kind pattern of banding and mottling reminiscent of flowing water.

Once a lost art, we sought out a knifemaker who has resurrected the craftsmanship of Damascus steel to create the *Legend Knife*. The genuine Damascus steel blade folds into a tri-colored pakkawood handle that's prepared to resist the ravages of the great outdoors. When not in use or on display, The *Legend Knife* stays protected in the included genuine leather sheath.

"If you have a Damascus steel blade knife, you have a knife blade with unique beauty. With its historical reputation as the metal used for the best swords over hundreds of years, and its distinctive wavy design, Damascus steel is a beauty to behold."

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Bow Fishing



ILLUSTRATION © JESSICA BLANK

HUNTING PLUS FISHING

equals an outdoor adventure that offers plenty of excitement.

Bow fishing combines the stealth and shooting skills of a bow hunter with an angler's knowledge of fish habitat and behavior. Beginners should start with a licensed guide to learn about the specific species allowable (nongame fish only), proper equipment and methods.

"The fish we go after include many gar

species, carp and buffalo," says Marty McIntyre, a guide with Garquest, who also teaches bow fishing at Becoming an Outdoors Woman workshops. (Other nongame fish include coastal species such as flounder and black drum.)

Two differences between bow fishing and pole fishing: proper identification of a fish (and size, if length limits apply) is done *before* taking a shot, and there is no

catch-and-release. As with game species, nongame fish must be properly consumed or used as bait.

Most sporting goods stores carry the needed gear, but archery shops will carry more equipment and offer proper setup.

Bow fishing requires a fishing license. To hunt turtles or frogs, a hunting license is required. Wear a life jacket and study your *Outdoor Annual* for regulations.

By Steve Hall

GEAR UP



BOW: Standard archery equipment like recurve or

compound bows, 50 pounds or less (longbows and crossbows are legal). The bow should be comfortable and easy to pull back, hold and release.



ARROW: Typically solid, fiberglass construction, 33

inches long; some prefer mixed aluminum or carbon/fiberglass and shorter arrows. Sliding rings or holes drilled into the arrow shaft affix the line to the reel.



TIPS: Tips are steel or alloy field points with two

barbs, jutting outward and downward from the point so the fish can't slide off the shaft.



REEL/LINE: Styles include "bottle" retrievers, spin-cast

reels and "wrap" reels. Line is usually braided nylon, 200-pound for the retriever and 150-pound for the spin-cast reel.



FLOATING CRAFT:

Usually pontoons or modified flat-bottom boats affixed with rails, lights, platforms and other modifications for a comfortable, sturdy and safe shooting stance.



SHORELINE FISHING:

Consider proper waders and/or footwear for wading in muddy, reedy shallows of lakes, streams or bays.



ACCESSORIES:

Safety items, pliers, grips, coolers/containers for fish, fillet/fish knives, lights for night fishing, camera, mosquito repellent, sun protection and adequate clothing.

MORE INFORMATION

- **FISHING REGULATIONS:** tpwd.texas.gov/regulations
- **TEXAS BOW FISHING ASSOCIATION:** texasbowfishingassociation.com
- **BOW FISHING ASSOCIATION OF AMERICA:** bowfishingassociation.com
- **GARQUEST:** garquest.com

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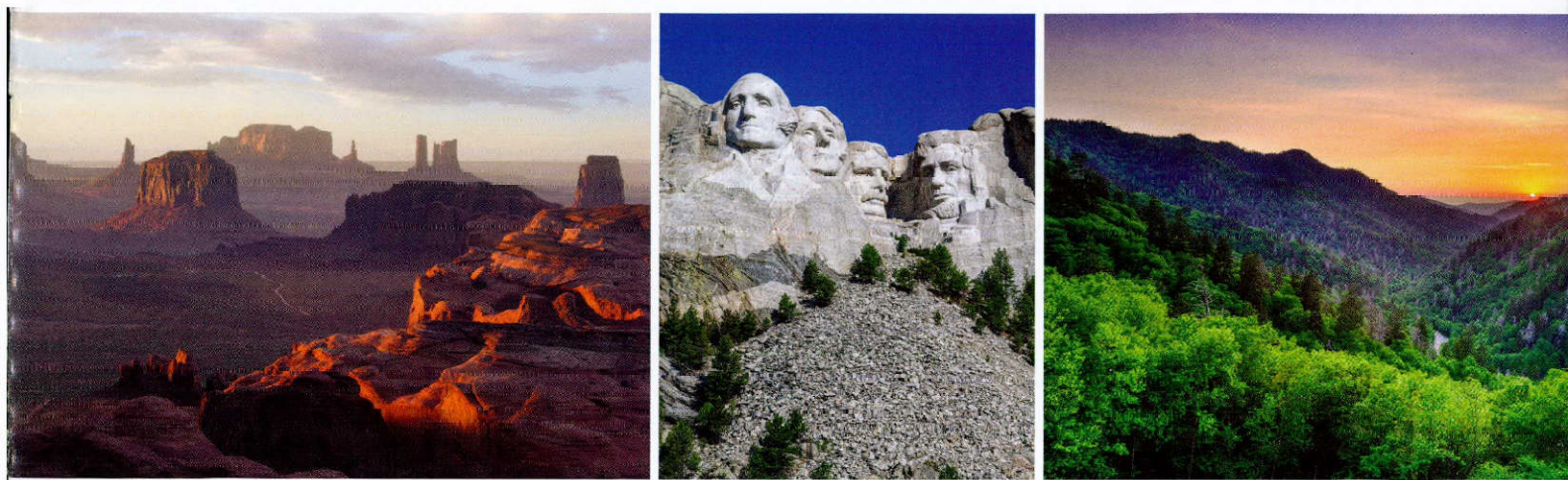
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PARTING SHOT

The Panhandle changes character when a thunderstorm arrives. The sky turns black, and rain pounds the ground. Photographer Russell A. Graves captured this shot after a storm had just passed. "While the skies were still angry, a beam of light broke through the clouds and made this intense ribbon of color," he says. The challenge in this shooting situation, Graves says, is that you have to out-think your camera. The camera may try to expose for the dark clouds, which will make the rainbow wash out. Instead, Graves tries to meter off an object that's about the same brightness as the rainbow.

TOOLS Canon EOS 5D Mark II camera, 70-200mm f/2.8L USM lens, f/8.0 at 1/320 of a second, ISO 200.



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