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TEXAS

PARKS & WILDLIFE

The OUTDOOR
MAGAZINE of
TEXAS

RANGE
OF THE
RIO GRANDE



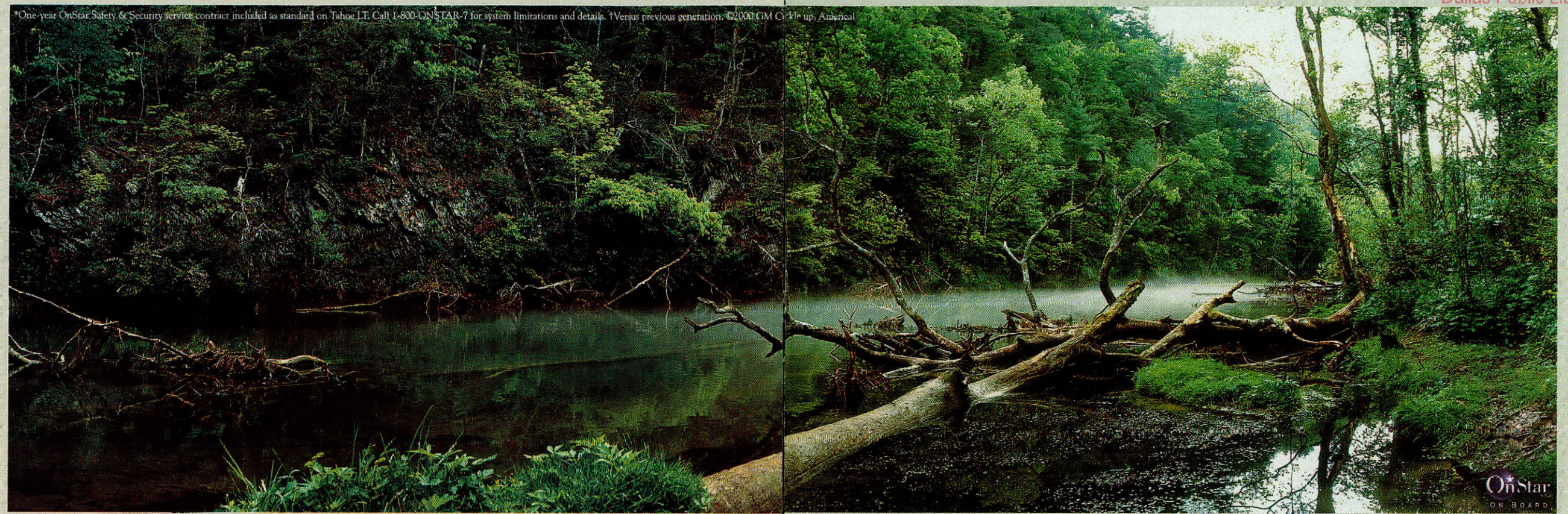
MONAHANS:
SANDHILLS
SURFERS

TRINITY BAY:
HOT COASTAL
FISHING

TOO MUCH
OF A GOOD THING:
TEXAS FLOOD

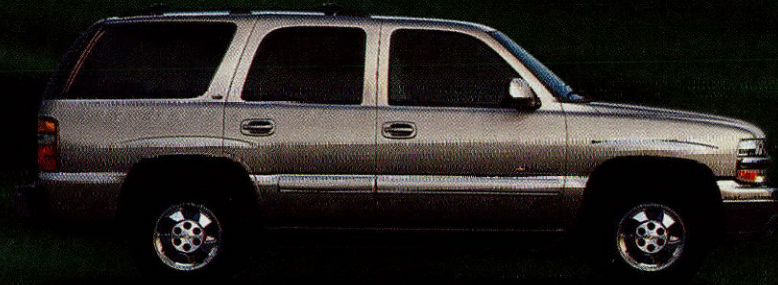
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MARCH 2002

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Front: The Rio Grande turkey has been called the crown jewel of the Texas outdoors. Read about this handsome bird beginning on page 22. Photo © Mike Searles.

Back: Springtime thunderstorms can bring flooding to Texas, the most flood-prone state in the nation. Turn to page 38. Photo © Wyman Meinzer.

For the latest and greatest parks and wildlife information, check out our Web site <www.tpwd.state.tx.us>.

AT ISSUE

From the Pen of Robert L. Cook

This is my first At Issue column as executive director of Texas Parks and Wildlife. I've been professionally involved in this field for 36 years, with more than 24 years at Texas Parks and Wildlife. But I've been connected to the land since I was born.

I grew up on a working farm in Central Texas, which was a novelty to the rest of our extended family, who visited our farm during summer and the holidays. They came from big cities like Waco and Port Neches, and when they came to visit, it was pallets on the floor or out in the yard, depending upon the weather.

My cousins had never seen a chicken actually lay an egg, and they watched wide-eyed as I milked our cow. Here, on our working farm, they first learned that the bacon we had for breakfast actually came from pigs, and fish for the evening's fish fry from our own pond.



Given the fact that we are generations removed from the land, how can our children and grandchildren experience, and begin to understand, its critical importance to them?



I was surprised to learn that my city cousins knew so little about the land, and was anxious to show them what they were missing. There were already 8 million people in Texas back then, and as far as I was concerned, far too many of them lived in the cities.

Of course, *we* understood the importance and the significance of the the land; we lived there.

Today we call those folks "urban Texans," and of the 20 million people in Texas, the vast majority live in our state's largest cities. They say by the year 2030 our population will double again. Given the fact that we are generations removed from the land, how can our children and grandchildren experience, and begin to understand, its critical importance to them, their food and water supply, and their daily lives?

It begins with you.

For starters, we invite you to come visit your "country cousins" at Texas Parks and Wildlife. Get outdoors. Take a hike. Go fishing. Experience our state parks, wildlife management areas and fisheries centers.

Whether you birdwatch, fish, camp or hunt, the connection to the land is right around the corner. Show your children that milk really does come from a cow by visiting the Sauer-Beckmann Farmstead at LBJ State Park and Historic Site near Johnson City, or Barrington Farm at Washington-on-the-Brazos State Historic Site near Brenham. Sleep under the stars at a Texas state park. Learn about wildlife at our many wildlife management areas across the state, or learn about the importance of providing adequate fresh water for fish and wildlife at our fisheries centers in Athens and Lake Jackson.

But, perhaps most important, you can get away from it all in the great outdoors of Texas. And while you're at it, get connected.

To the land, and to each other.

Come see us. Bring your pallet. Stay a while.

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**To manage and conserve the natural and cultural resources of Texas
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MARCH 2002, VOL. 60, NO. 3

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ABC AUDITED

Todd Votteler, Ph.D. is a Dallas native whose love of the outdoors as a youth evolved into a career in natural resources science, management and policy. Currently director of water policy for the Guadalupe-Blanco River Authority, Votteler also teaches a graduate course on environmental conflict management focusing on water disputes in the department of biology at Southwest Texas State University. During the Endangered Species Act litigation over the Edwards

Aquifer, Votteler served as the federal special master for U.S. District Judge Lucius Bunton. This month's story on floods is a companion piece to Votteler's story on drought in the July 2000 issue.

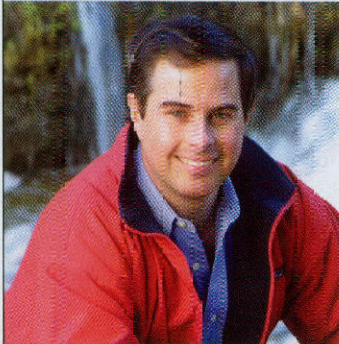


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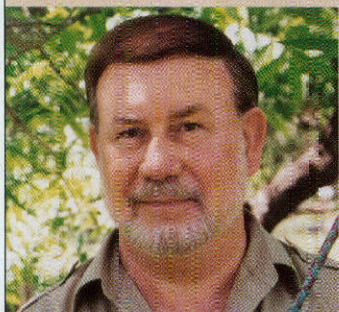
Erica House Brasseux, associate editor of *Texas Parks & Wildlife* magazine, takes readers to the Highland Lakes area in this issue's "Three Days in the Field." She developed a passion for outdoor writing during her junior year at Southwest Texas State University, and was awarded the Texas Outdoor Writers Association scholarship in 2000.

She began her career with the magazine as an editorial intern. Born and raised in Paris, Texas, she and her husband, Eric, now make their home in Austin.



Berk Elliott, who grew up hunting and fishing on the Texas Coast in the late 1940s and early 1950s, has been a full-time writer since 1989. His articles have appeared in a number of publications, including *Texas Hunting*,

The Pasadena Citizen, *Freshwater Angler*, *Texas Sportsman*, *Gulf Coast Fisherman* and *Gulf Coast Connections*. A resident of Pasadena, he is a member of the Texas Outdoor Writers Association.



IN THE FIELD

MAIL CALL

Picks, Pans and Probes from Previous Issues

FOREWORD

LETTERS

March beckons! Surely there's no prettier place on the planet than Texas in the springtime. So lace up your boots, grab your shotgun, rod 'n' reel, binoculars — or even a "sandsurfing board" — and head outdoors!


Wildlife editor Larry D. Hodge is one of the true Rio Grande turkey aficionados I know. Accompanying him several years ago on my first spring turkey hunt, it was easy to see why: the spectacular spring scenery combined with the up-close viewing of the turkeys' courting behavior made for a remarkable experience. As we knelt in a tangle of brush — completely concealed in camouflage from head to toe — a parade of wildlife, including white-tailed deer, armadillos, jackrabbits and turkeys, pursued their daily activities completely unaware of our presence.

Even if you are not a hunter, try going out this spring with a turkey-hunting friend: you'll see more wildlife in a day than most folks see all year. Hodge delves into the fascinating Rio Grande turkey — a true Texas native — beginning on page 22.

If you just can't wait for spring, here's a tip: Grab your rod and reel, jump in your car and head for the coast, where spring first unfurls her blanket of bluebonnets across the state. Just remember that beautiful scenery doesn't always mean topflight fishing. Berk Elliott, beginning on page 46 in "The Mystery of Trinity Bay," explains what canny anglers know: You can't judge a book by its cover, or a productive fishing hot spot by the attractiveness of the shoreline scenery. So ignore the petrochemical plants and focus on the scrappy reds and trout beneath the surface. (Another favorite spot of mine, Nueces Bay near Corpus Christi, is also relatively underfished for the same reason, but *don't tell!*)

For something completely different, head out to Monahans Sandhills State Park and try your hand at sand surfing on the dunes. Freelancer Dan Oko did, and met Odessa resident Thomas Rodman, 71, who's still mixing it up on the dunes with younger thrillseekers. Oko's story, "Sand Blast," begins on page 32.

So pack this issue in your knapsack or tackle box, head outdoors and answer March's call!



Summer Camps

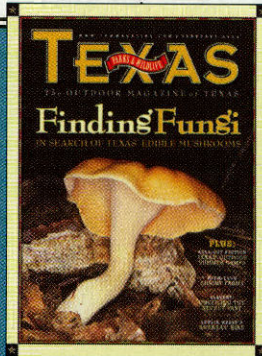
The pull-out section, Texas' Outdoor Summer Camps (February 2002), failed to mention camps administered by the nearly 45 Texas councils of the Girl Scouts of the USA (2.7 million youth members nationally) and the Boy Scouts of America (3.3 million youth members nationally). These two organizations are the premier organizations in youth development and yet only Camp Fire USA (0.6 million youth members nationally) and YMCA (2.4 million youth members nationally) were mentioned in the article.

In addition, the YMCA is not a "public agency;" it is a not-for-profit youth development organization.

The article concept is great: to help parents choose an outdoor camp experience for their children, but it should have included a thorough discussion of all options available.

Aaron Wendt
Sealy

THE EDITORS REPLY: We apologize for the oversight, and wish we had been able to include all camps in the space allotted. The YMCA is not a public agency, of



I found it interesting that the back cover of the February 2002 issue shows one of the reenactors (portraying a hard-working woman from Washington-on-the-Brazos in period dress) with a very impressive manicure!

Morris Creel,
Georgetown

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course, but one of the foremost not-for-profit organizations in the country. The Girl Scouts of the USA and the Boy Scouts of America operate many great camps. For more information contact the Boy Scouts at (972) 580-2000 or go to www.bsa.scouting.org. Additional information can be obtained in Passport to High Adventure, a national publication of the Boy Scouts of America about their camping facilities. Girl Scouts information can be found at www.girlscouts.org or (800) GSUSA4U.

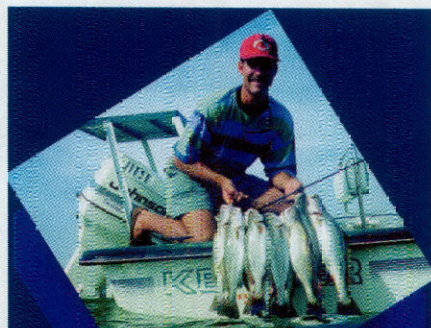
RUNRV? IM12

A year ago we bought a recreational vehicle. We thought it would be a great way to see Texas with our children without spending a lot of money. The parks are remarkably affordable. A premium site costs about \$15.

This past year we visited five parks from the Gulf Coast to the Davis Mountains. Our first trip was to Choke Canyon. The south unit, where we camped, is a lake fisherman's paradise. Our next trip was to Palmetto State Park outside Luling. We were amazed by the beautiful plant life, so seemingly out of place. Our next stop was Garner State Park near Concan. This is one of the most popular parks in the state, and we could see why. We have also visited Goose Island State Park outside Rockport. Fishing is the main attraction for this park, but there are many activities to enjoy. We visited our favorite state park, Davis Mountains, in the middle of July. It was very warm during the day (low 90s) but pleasant in the shade and cool at night.

Visiting the parks with an RV is a way for us to enjoy all the diversity and beauty the Texas parks offer while having all the comforts of home. We're already looking forward to our next adventure!

Mary Ellen Barak
Red Rock



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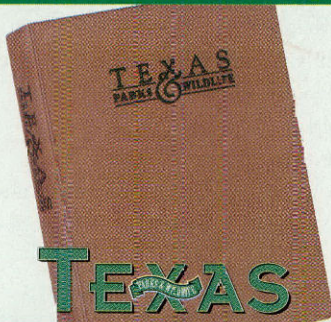
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MAIL CALL

Flushed with excitement over retirement-generated freedom, we bought our first RV in April 2001 and toured the Rio Grande Valley via East Texas to Corpus Christi and farther south. We drove from our home in Oklahoma to Caddo Lake State Park, down past the Pineywoods, through the Big Thicket, and then to Austin. We visited The Lady Bird Johnson Wildflower Center while in Austin, and from there made our way south to Goose Island State Park.

We went from Goose Island to Bentsen-Rio Grande Valley State Park in Mission. In addition to the wonderful birding, seeing and hearing the elusive chachalaca was a thrill. And while I was walking my dogs early one morning I spotted a bobcat not 10 feet away from me! From there we continued south to Falcon State Park, which was interesting in its own way, despite the lack of water in the reservoir. Our last stop was beautiful Lake Mineral Wells State Park near Weatherford.

Texas is so diverse, in wildlife and in habitat, making every trip a pleasure. The state parks are very well maintained and each one has had its own distinct flavor.

*Joanna FitzGerald
Sand Springs, Okla.*

In 1965 we started a business in Addison, and a year or so later we won a pop-up tent-trailer. One of our early outings was to spend Thanksgiving at Goose Island State Park. For the next 20 years we celebrated Thanksgiving there. We would eat Thanksgiving dinner — flounder — at the Duck Inn. Some years our kids went swimming in the Gulf, while other years we might have an ice storm. We visited the Aransas National Wildlife Refuge nearly every year and cheered when there were more whooping cranes.

As our family grew up, our kids brought their friends from college. We traded that first trailer with more than

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100,000 miles on it for another that was larger and grander. Then came our first motor home, and now we own our fourth. We visit Goose Island and the Aransas National Wildlife Refuge every few years.

*Bob and Barbara Wilson
Richardson*

My wife and I bought a motor home when we retired in 1991 and have been camping almost exclusively in Texas state parks ever since. We try to do most of our camping during the week and leave the weekends for the younger campers with children.

Our favorite state park is Davis Mountains State Park. We have been there at least once a year since we retired. En route to Davis Mountains we usually stop and spend the first night at Garner and the second night at Seminole Canyon, both very scenic parks with plenty of birds, wildlife and hiking trails. Other favorites include Blanco, McKinney Falls, South Llano River, Inks Lake, Pedernales Falls and Lake Somerville.

*Harold Bishop
Austin*

Sound off for "Mail Call!"
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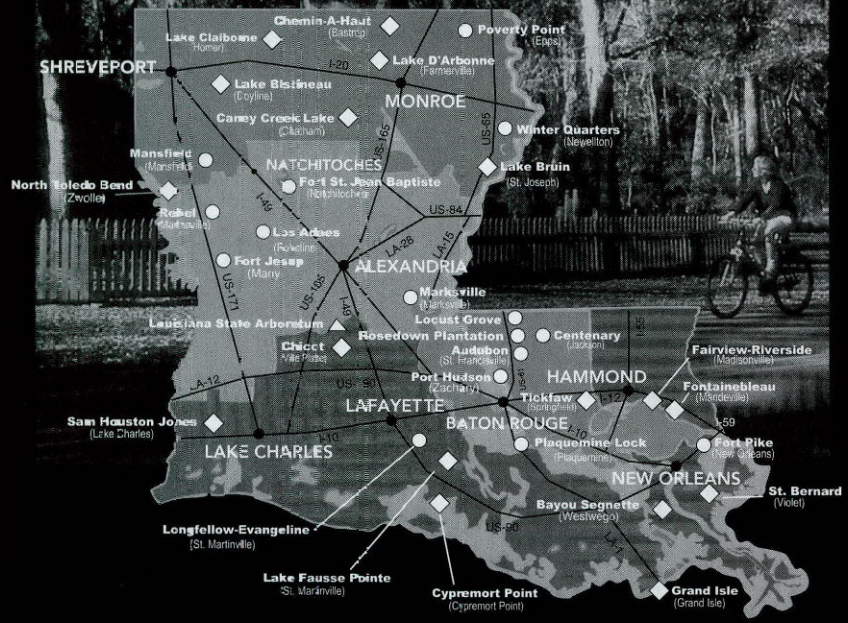
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SCOUT

NEWS AND VIEWS IN THE TEXAS OUTDOORS

WILD LIFE

Buoy, oh Buoy

The expansion of an artificial reef attracts coastal fish.

FOUR LARGE METAL BUOYS are now a part of Basco Reef, an artificial reef site created by Texas Parks and Wildlife. The buoys, which are 25 feet long, were sunk at the site, 23 miles southeast of Sabine Pass, in August.

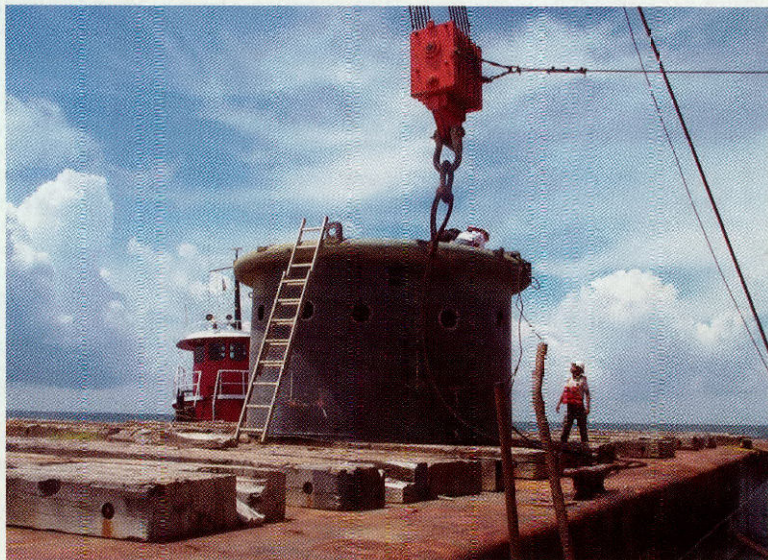
According to the reef's namesake, Irby Basco, a member of the TPW Artificial Reef Advisory Panel, they should be a huge boon to marine species and area fishers.

"The buoys were sunk out away from the rocks that are already there, to increase the amount of fishable habitat in the area," Basco says. "I'm hoping we'll be able to get lots of structure put on those reefs so fishers can enjoy quality fishing without having to run way offshore."

The buoys make perfect fish habitat, as they have large holes cut in the sides to allow fish and other marine life to enter and exit.

The northern Gulf of Mexico is virtually structure-free, particularly nearshore, which is why fish bond to oil rigs and boat wrecks in the area. When hard structure is sunk, basic life forms like barnacles and sponges cling to it, creating the basis for an entire miniature food chain.

Basco and others support the use of artificial reefs as a way to promote quality nearshore fishing and enhance fish habitat in the Gulf. "Alabama has by far the largest artificial reef system in the Gulf," he says. "They have army tanks, voting machines and all kinds of things sunk there. They have by far the smallest coastline of the Gulf states,



but they produce 35 percent of the overall recreational red snapper catch. The reefs are working."

Basco Reef seems to be working as well. TPW biologists say the reef, which sits in 43 feet of water, is home to lots of red snapper and grouper and seems to attract sea turtles.

"It's amazing how many fish are on that structure. It's become a pretty popular place for local fishermen to pick up snapper," Basco says. Scuba divers also enjoy the site and have reported seeing a monstrous goliath grouper estimated to weigh more than 400 pounds.

Two other reef sites, SALT (named after the Saltwater Angler's League of Texas) and Sabine, are designated for expansion. "There are some rocks sitting on a dock in Sabine Pass right now that should be heading to the SALT reef soon."

— Chester Moore, Jr.



10 PLANTS TO ATTRACT WILDLIFE

Want to attract the birds and the bees — and the butterflies — to your backyard? Here are some native plants even a monarch could love. // **By Noreen Damude**

1. MAXIMILIAN SUNFLOWER (*Helianthus maximiliani*)

Bloom: Late July to October
Range: Statewide except deep East Texas and far South Texas
Habitat: Seasonally moist depressions in prairies to limestone hills
Sun: Full sun to partial shade
Soil: Well-drained clay, limestone, sand or loamy soils
Propagation: By seed in the spring or by root division
Wildlife Value: Splashy golden flowers attract butterflies; birds and mammals eat seeds

2. LANTANA (*Lantana horrida*)

Bloom: March to December
Range: Statewide
Habitat: Diversity of habitats
Sun: Full sun to partial shade
Soil: Well-drained soils of all types
Propagation: By seed or cuttings
Wildlife Value: Provides dependable food source for both butterflies and hummingbirds; songbirds readily devour seeds

3. EASTERN CORALBEAN (*Erythrina herbacea*)

Bloom: April to first frost
Range: Eastern third of state
Habitat: Sandy woods, but easily cultivated elsewhere
Sun: Full to partial sun
Soil: Well-drained acid or calcareous sand, loam or clay soils
Propagation: Scarified seed in

spring, semi-hardwood cuttings, or root division
Wildlife Value: Hummingbirds find the nectar-rich blossoms irresistible

4. RED INDIAN BLANKET (*Gaillardia pulchella*)

Bloom: April to frost
Range: Statewide
Habitat: Sandy prairies and open woods
Sun: Full sun to partial shade
Soil: Well-drained sand
Propagation: Sow fluffy seeds in fall, then transplant seedlings in fall or winter
Wildlife Value: A great favorite of butterflies and other insects

5. BUTTERFLY WEED (*Asclepias tuberosa*)

Bloom: April to September
Range: Widespread in eastern two-thirds of the state
Habitat: Prairies, thickets and open woods
Sun: Full sun to partial shade
Soil: Well-drained sand, clay or limestone soils
Propagation: By seed or root cuttings
Wildlife Value: Many species of butterflies use it as a nectar source, and monarchs and queens use it as a larval host plant

6. CORAL HONEYSUCKLE (*Lonicera sempervirens*)

Bloom: May bloom all year
Range: East Texas to

Central Texas
Habitat: Found naturally in woods and thickets
Sun: Favors morning sun and dappled shade in the afternoon
Soil: Tolerant of poorly drained sand, loam or clay soils
Propagation: By seed or by cuttings taken summer to fall
Wildlife Value: Highly coveted by hummingbirds and butterflies for its nectar; fruit-eating birds feast on the bright red berries

7. TEXAS PURPLE ASTER (*Aster patens*)

Bloom: September to December
Range: Statewide except far West Texas
Habitat: Prairies, meadows, woodland openings and edges
Sun: Full sun to dappled shade
Soil: Well-drained sand, loam, clay or limestone soils
Propagation: By seed in the spring or fall or by root division
Wildlife Value: Highly attractive to butterflies and many species of beneficial insects

8. PURPLE CONEFLOWER (*Echinacea sanguinea*)

Bloom: Late April to June
Range: Eastern one-half of the state
Habitat: Prairies, hillsides, slopes and pine-hardwood forests
Sun: Full sun to dappled shade
Soil: Well-drained sandy or gravelly soils

Propagation: By seed in the fall or by root division
Wildlife Value: Attended by a wide diversity of butterflies and other insects for pollen and nectar

9. TROPICAL SAGE (*Salvia coccinea*)

Bloom: March to December; all year in South Texas
Range: Eastern half of state
Habitat: Chaparral, thickets or woodlands, along stream edges and on floodplains
Sun: Full sun to shady areas
Soil: Sand, loam, clay or caliche
Propagation: By seed in fall or by cutting in spring
Wildlife Value: A favorite nectar source of hummingbirds and butterflies

10. STANDING CYPRESS (*Ipomopsis rubra*)

Bloom: May to August
Range: East and Central Texas
Habitat: Open woodlands, brushlands and gentle slopes
Sun: Full sun
Soil: Well-drained dry sandy or rocky soils
Propagation: Sow seeds in the fall; transplant rosettes in late fall
Wildlife Value: Scarlet tubular flowers attract hummingbirds

Remember to check with the property owner before collecting from the wild for transplanting. Also, collecting is prohibited on state-owned lands without the proper permit.

PHOTOS 6 AND 10 © JOE LIGGIO; OTHER PHOTOS © KAC PRODUCTIONS



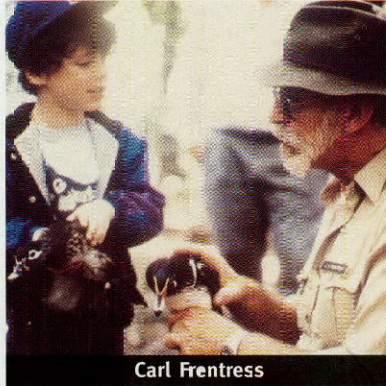
CONSERVATION

ENVIRONMENTAL HEROES

A new video archive captures the stories of pioneers of the Texas conservation movement.

SELF-TRAINED BOTANIST Geraldine Watson documented the great biodiversity of the Big Thicket and played a direct role in its designation as a national preserve. Texas Parks and Wildlife biologist Carl Frentress developed a wildlife management plan that offered landowners an incentive to protect natural resources. John Graves, author of *Goodbye to a River* and *Texas Rivers* (to be published by Texas Parks & Wildlife Press this summer) writes books that celebrate unspoiled natural places. These and 125 other pioneers in the Texas conservation movement will soon be immortalized in an electronic video archive available to scholars at the University of Texas' Center for American History.

"We want to recruit a new generation of environmentalists who see that



conservation is not just happening in the Amazon Valley — it's happening in the Rio Grande Valley, too," says David Todd, coordinator of the Austin-based Conservation History Association of Texas.

"There's a whole lot of people who were there at the beginning of the environmental movement, people who were very brave in their communities,"

Todd says. "Some are in their 90s, some are in their 50s. Some are left-wing, some are far right."

Access to the archives is currently limited to scholars, but the videos and transcripts should soon become available to the public on the Internet. (For more information about the Texas Legacy Video Archive project, visit <www.texaslegacy.org> or e-mail David Todd at dtodd@wt.org.)

"Hearing these stories is an incredible experience," says Quinn Stewart, information analyst at the UT Graduate School of Library and Information Science, who helped Todd with the digitizing process.

Todd agrees. "This will be a good tool for getting the word out and recruiting new people to the cause of protecting nature."

— Kim Tilley

TEXAS READER

Frontier Blood: The Saga of the Parker Family

TEXAS SCHOOLCHILDREN know the story of Cynthia Ann Parker. How as a 9-year-old she was kidnapped by Comanches and taken to live among them. How her son, Quanah Parker, became the last chief of the Comanches. How she was recaptured and returned to her white family, and spent the end of her life longing for her Comanche family, the only one she really knew.

In *Frontier Blood: The Saga of the Parker Family* (Texas A&M University Press, \$29.95), Jo Ella Powell Exley places the familiar story in the larger context of an East Coast family that made their way across the frontier seeking civil and religious freedom, finally ending up in Texas.

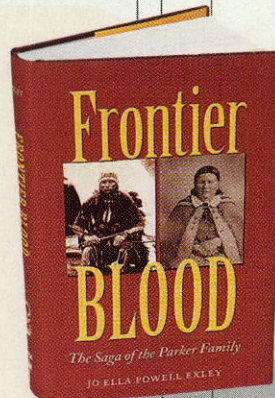
In a compelling narrative, Exley follows the Parkers from 1781, when Daniel Parker was born in Virginia into a "highly charged religious atmosphere," to 1875, when Quanah and the Quahadas surrendered to the U.S. military. Using a variety of first-person accounts and biographies of various Parkers, the author draws rich characters and brings the 19th-century frontier to life.

In a scene showing the Quahadas' departure from the

Staked Plains, Exley quotes from an account by Dr. Jacob J. Sturm: "I know these Indians bid adieu to these their old haunts with many regrets some offered pretty stern resistance to going in and I can not much blame them for it.... They have given up their old haunts, leaving their great waste plains to go down to live in the lower ground and learn the ways virtues and vices of their white brothers."

Entertaining as well as informative, *Frontier Blood* brings a fresh perspective to a familiar Texas story.

— Mary-Love Bigony



FIELD NOTES

FREE FIELD CHECKLIST

Get a head start on springtime birding with *Birds of the Pineywoods of Eastern Texas: A Field Checklist*. The free, 12-page booklet lists 353 species with monthly abundance codes. Send a 6 x 9-inch, self-addressed envelope with two first-class stamps to Cliff Shackelford, Texas Parks and Wildlife, 3000 Scuth I-35, Suite 100, Austin, TX 78704.

FIELD TEST

It's a Cinch

Cinch on one of the new daypacks for a fun, hands-free adventure.

BY GIBBS MILLIKEN

DAYPACKS HAVE COME a long way in recent years. Hikers and schoolchildren alike now can enjoy the comfort of improvements like contoured shoulder straps and mesh pads set against the back to increase airflow. The **Fusion** (\$119.90, JanSport, (800) 426-9227), for example, incorporates soft gel cells in the straps and molded synthetic padding at the hips for load support. It provides ample room for food, raingear, camera, binoculars, field guides — plus a CD player compartment and internal cell phone pouch for people who want all the comforts of home.

One of the best contemporary designs on the market is the **Stormfront Pack** (\$160, Patagonia, (800) 638-6464). This daypack has a detachable, waterproof bladder-pod that can be used for dry storage, extra flotation or as a soft pillow when covered with a T-shirt.

For a hands-free short trek or paddling trip around the lake, waist packs offer minimal but sufficient storage. The versatile **Coleman Lumbar Pack** (\$39.99, Coleman, (800) 835-3278) can be converted quickly to a lightweight shoulder bag by folding the hip pads into a special pocket and attaching the shoulder sling. This excellent Coleman pack, part of the X-Ponent System, is designed to be mounted as an extra pocket on the larger Coleman packs.

Looking for multiple pockets? Fishers, hunters and photographers will find the camo **Western Belt Pack** (\$19,

Clockwise from top: Patagonia Stormfront, Coleman Lumbar, Western Belt, Gemini Belt, Filson Rucksack, Fieldline Outfitter, JanSport Fusion with Sealline Dry Bag.



well-constructed to carry the essentials like field guides, notebooks, camera and film. Included with this model are finger-grip, twin leakproof SportFlask bottles that are easily accessed from elastic-strapped insulated holders.

Need a roomy camo pack? The **Fieldline Outfitter** (\$44.99, Academy Sports & Outdoors, (877) 999-9856) in soft fleece camo cloth is perfect for

bulky hunting gear. It has a padded mesh back with technical shoulder, sternum, hip and compression straps, dual side-entry zippers and a molded handle to carry as a duffel. To make medium-size day packs more versatile, add internal liners in the form

of clear, waterproof **Sealline Dry Bags** (\$10-\$20, 5- to 30-liter sizes, Cascade Designs, (206) 583-0583). These multi-functional bags keep delicate items dry and safe with a cushion of air.

For a retro look, some people like the original **Rucksack** (\$211, C.C. Filson, (800) 624-0201), made of heavy cotton twill with solid brass and harness-leather fittings. Although it

doesn't have the comfort advantages of the new designs, this quality product only gets better-looking with age and rough use.

How can you tell if a day-pack fits correctly? In general, you should wear it on the upper back, hanging just below the shoulders, with the bottom resting on the hips. The shoulder straps should be snug, but not so tight that they cut into your armpits or the front of your shoulders. Some daypacks have a sternum strap to help keep the pack from shifting off center. Always test a pack using a normal load to see if it's a proper fit for your size and physique. After all, a comfortable pack lets you take your mind off your gear and put it on the great outdoors. ★

B.A.G.S., (888) 224-4327), with its nine pockets and water-repellent polyester fabric, especially useful. This durable belt allows you to keep small items separate and readily accessible.

For hikers and birders, the **Gemini Belt Pack** (\$45, Ultimate Direct.on, (800) 736-8551) is an ideal size and

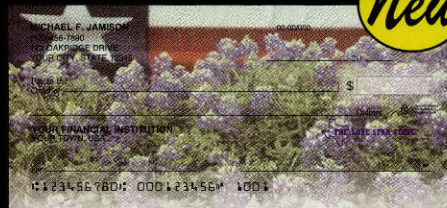
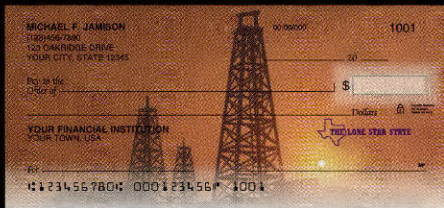
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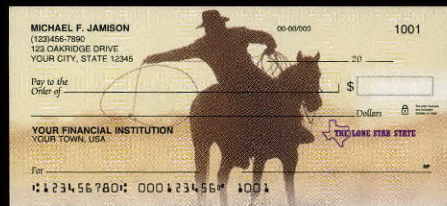
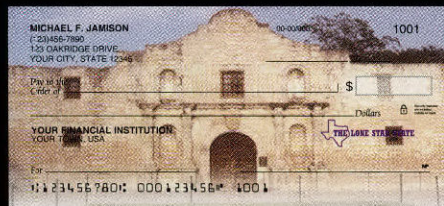
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SKILLBUILDER

Grow Your Own Bait

In the latest back-to-the-earth movement, you can compost your garbage and grow earthworms at the same time.

BY GIBBS MILLIKEN

COMPOSTING WORMS are hardy and can be grown in any type of stable container with one square yard or more of a mixture of bedding material, adequate organic matter and drainage. The worms live and feed in the upper layer of the bedding mix. These materials must be deep enough to keep the earthworms cool and moist.

MAKING A WORMBED

Hardware stores carry all the necessary items for the bin construction. Three good choices of material for constructing a wormbed are a metal-staked wire mesh structure, a cinderblock arrangement, or a frame of untreated wood. The ideal size is 3 to 6 feet wide, 2 feet deep and 16 to 24 inches high. If you use wire mesh, line the sides with burlap to keep the worms from escaping and to provide aeration. The bed should be on the ground in a protected location to avoid freezing in winter. This bed becomes a vermi-compost bin and must have ventilated sides to keep it alive and growing.

STOCKING WORMS

The best-grade worms for our temperate zone, the angleworm *Eisenia fetida*, are available for \$24 per pound, including delivery from Jay Mertz, Rabbit Hill Farm, 288 SW CR0020, Corsicana, TX 75110, (903) 872-4289. Other supplies, like cotton burr and starter compost bedding can be obtained from the Natural Gardener, John Dromgoole, in Austin: (512) 288-6113.

The initial stocking for angleworms is one or two pounds of worms per square yard of area in a bedding mix of

approximately two-thirds shredded newspaper, including some cotton burr or other compost, and one-third decayed organic matter. Overstocking and underfeeding will result in fewer worms and smaller sizes.

After a three-week incubation period, the worm eggs hatch, grow rapidly and reproduce in about three months. Depending on growing conditions, worms may take up to six months to reach their full size. A properly growing worm culture yields two or three pounds of worms per square yard of bed the first year and increases slowly as the population matures.

During hot summers or prolonged dry periods, sprinkle the bed daily with water until evenly damp. Avoid overfilling the container, or the worms may crawl over the rim. In wet regions, some overhead protection from heavy rains may be necessary because too much water can drown or force the worms from the bed. To help prevent flooding, use gravel, fine sand and a perforated plastic drainage pipe in the base.

FEEDING WORMS

Worms feed on a variety of organic matter, including manure, kitchen waste, decaying soft leaves, grass clippings and ground grains like cornmeal. Each week, apply one pound of food per pound of worms and one inch of partially finished compost to the top of the bed. Avoid overfeeding, as this can lead to excessive heat, which will create an environment that causes the worms to dehydrate and die. Excess wet food also can grow unwanted web fungus, molds, mites and roaches, and attract wildlife like armadillos that dig up the



soil layers. (You may need to make a wire covering to keep out these larger pests.) Check the soil mix for adult ants and ant eggs, as they can quickly take over the bed.

SORTING WORMS

Worms grow most vigorously in the warmer months, feeding continuously near the bed surface, if kept dark by covering with a lid or carpet scrap. To sort, remove the top two or three inches of soil and separate the larger worms, using a wire mesh screen. Handle them gently to avoid bruising. Take only as many worms as you need for a few days of fishing. Store them in clean paper ice cream cartons filled with moist bedding material or peat moss. Perforate the lid, and protect the worms by keeping them at room temperature (refrigeration isn't necessary, but avoid the heat of direct sun, truck or tackle box). Check them frequently to see that they remain moist, but not wet.

Angleworms are wonderfully useful creatures. They keep your garden growing, eat your organic garbage and are the ideal bait for a wide range of fish species. ★

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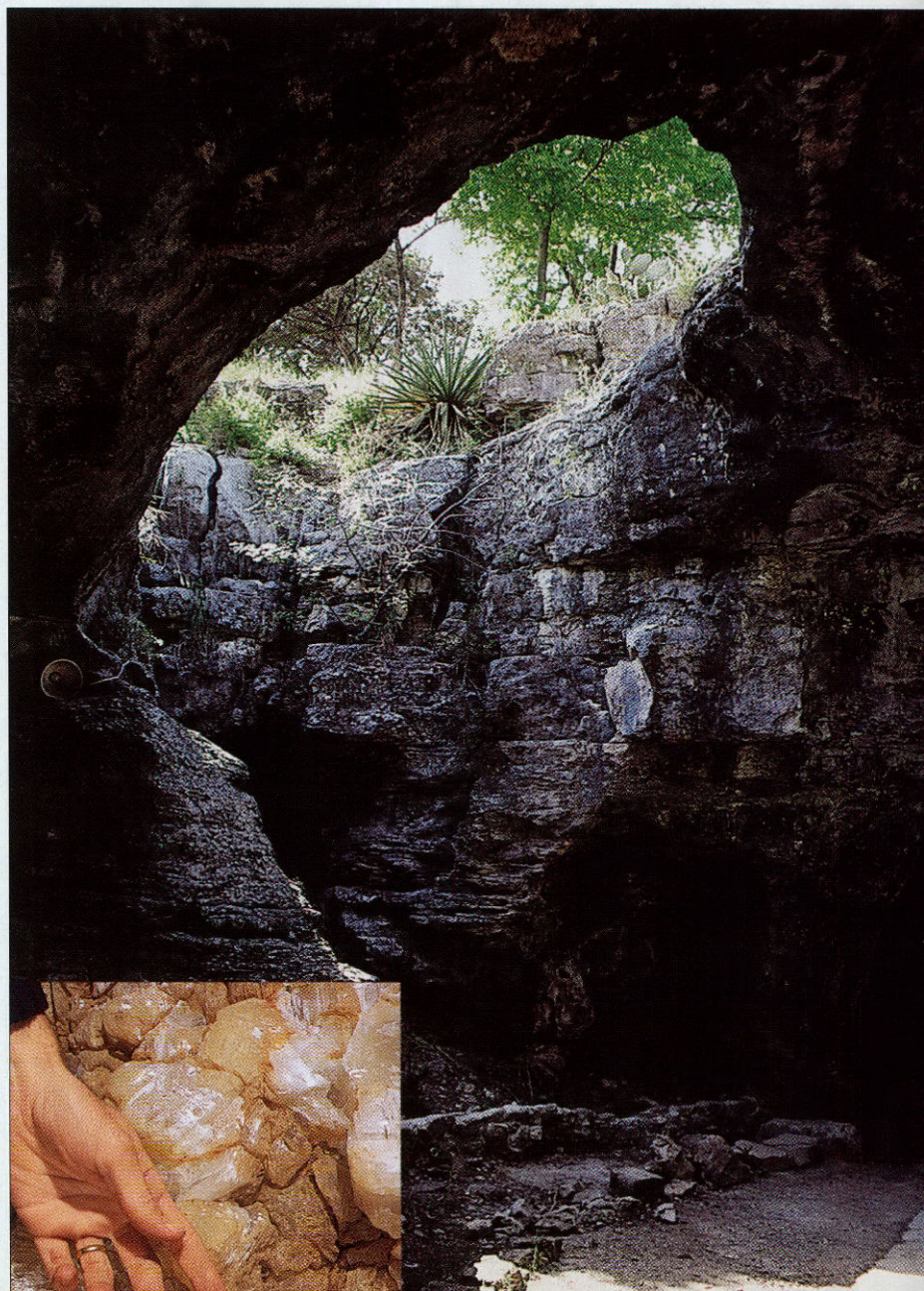
About an hour outside Austin I turn off the congested, four-lane highway and follow a quiet, two-lane blacktop winding along the Highland Lakes.

Roll down the windows, turn up the radio and set the mood for a weekend of outdoor recreation and relaxation.

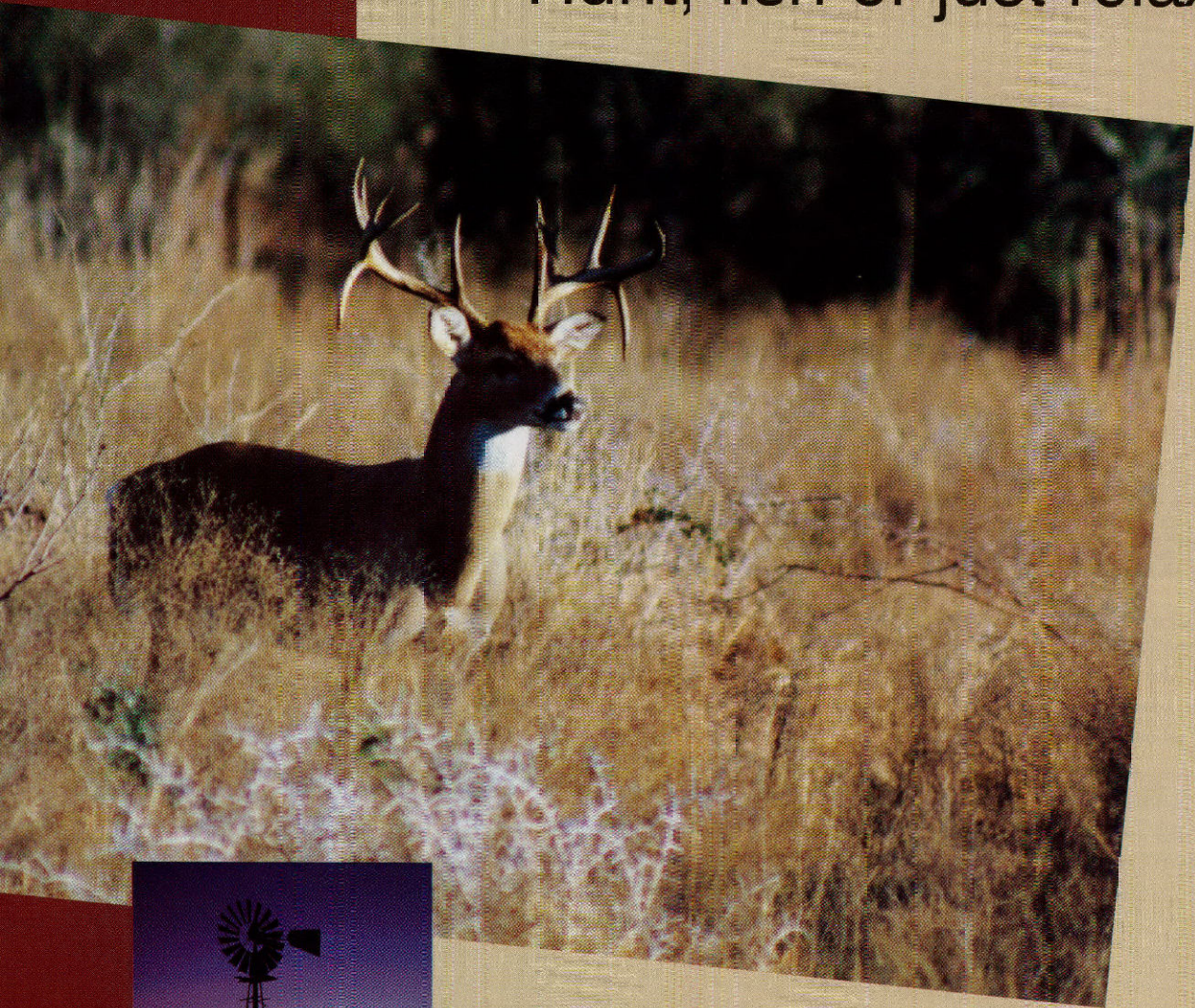
En route to Canyon of the Eagles Lodge, where I'll be spending the next two nights, I see brown signs signaling a state park, which beckon me to stray from my path. Longhorn Cavern State Park, one of the most frequented and talked about parks of them all, is at first glance not nearly as awe-inspiring as say, Enchanted Rock or Davis Mountains, whose majestic appeal are evident even before you pull through the entrance gate. At Longhorn Cavern, it's what lies beneath that sets this park apart.

Before we venture into the cave, our tour guide, Kaye Barlow, explains how a high-velocity river that flowed through the limestone cracks formed the cave some 280 million years ago. As we file down the first chamber, the cave's year-round, 68-degree temperature is a welcome relief from the sultry Texas heat.

Perhaps the most impressive of the cave's numerous and distinctively different rooms is Crystal City. It's like walking into the middle of a giant geode. Two magnificent domed rooms, known as the Indian Council Room and Church Room, contain most of the cave's unusual history. In the 1920s and '30s, Burnet County residents used the Indian Council Room as a nightclub, dance hall and restaurant. The



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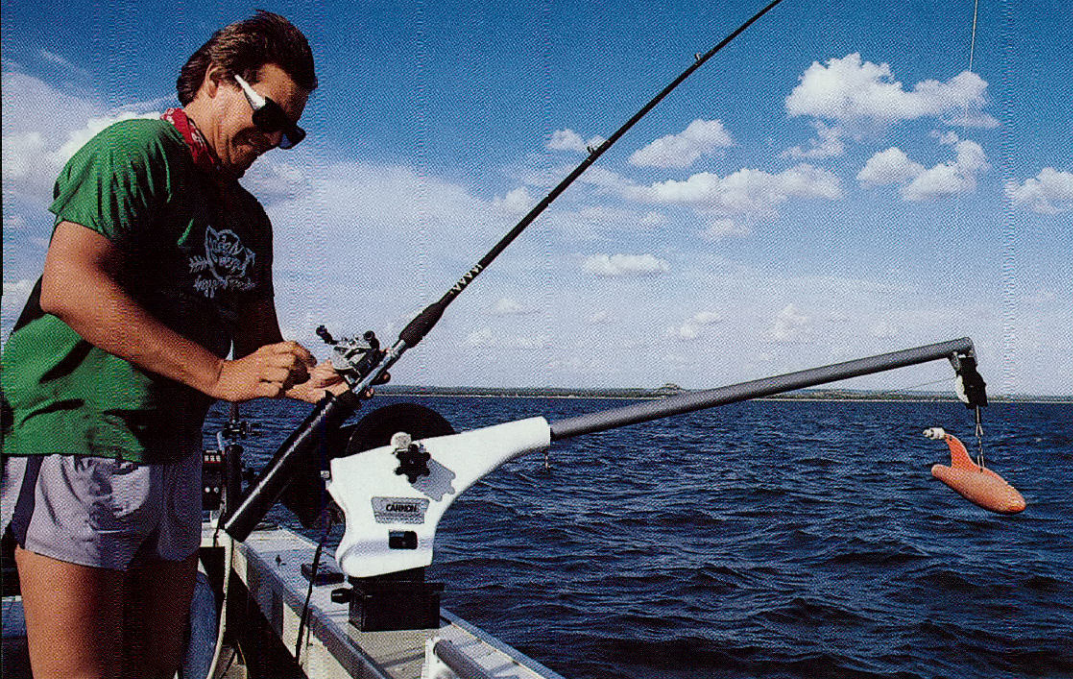



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Anglers at 30-m le-long Lake Buchanan, above, have plenty of elbow room. Longhorn Cavern State Park, previous page, offers guided tours through the cavern's chambers.

Church Room, complete with bleachers, was used for religious services and theater presentations. A natural hole in the cave ceiling provided plenty of sunlight and ventilation.

For decades, Comanches occupied Longhorn Cavern, and in more recent

history it served as a Confederate stronghold where gunpowder was manufactured in secret during the Civil War. One rumor suggests that the cave served as a hideout for the notorious Texas outlaw Sam Bass, who allegedly stashed gold there.

An hour and a half later we emerge, and I push onward to Canyon of the Eagles, a 900-acre lodge and nature park nestled along the northeast shoreline of Lake Buchanan.

Greeted with a warm welcome and a key to one of the lodge's 64 charming cabins, I unpack my bags and check out my view of the lake from my private porch. Birdfeeders, which adorn the limbs of numerous trees throughout the property, attract more than 150 species, including the endangered black-capped vireo and golden-cheeked warbler. But it's a feisty squirrel that frequents the feeder outside my window. His clumsy though diligent attempts to acquire the seeds from inside the feeder are highly acrobatic and very amusing.

I thumb through a brochure that outlines the park's daily activity schedule. From guided nature hikes to reptile programs, it's hard to decide what to do first. Perhaps such decisions are better made after a catnap in a porch swing, followed by a few cups of freshly brewed coffee. It seems to work for me, anyway.

I burn off my caffeine buzz on a nearby trail, which leads to the park store

down by the lake. Volleyball nets, canoes, kayaks and a fishing pier create a natural mecca for outdoor enthusiasts and family vacationers. Inside the store I purchase a ticket for tomorrow's Vanishing Texas River Cruise. A picnic lunch and scenic float down the Colorado River strikes me as the ideal way to spend the afternoon.

Tonight the coffee will again come in handy as the Austin Astronomical Society will host an all-night star party at the lodge's Eagle Eye Observatory. Sleeping in tomorrow morning will be a much-needed luxury.

BON VOYAGE

The 70-foot vessel is only half-full on the 11 o'clock voyage, but later this evening some 200 passengers will arrive for a privately chartered wedding and reception cruise. White tulle and greenery already garnish the archway on the pier, providing a festive prelude of the upcoming sunset ceremony.

Known primarily for the Bald Eagle Cruises from November through March, the river cruise operates year-round and offers various seasonal opportunities.

This afternoon more than 12 miles of hiking trails will keep me busy. Later in the evening the main patio, beneath a towering live oak tree and a blanket of stars, provides an enchanting venue for guests to enjoy live entertainment. Brad Collins kicks off the night's events with cowboy storytelling, followed by western singer and yodeler Jill Jones. An impressive fire-spinning demonstration culminates almost three hours of back-to-back entertainment. By 10 p.m. I'm exhausted and ready for bed.

THE BIG ONE

After a good night's sleep and a buffet breakfast, my husband, Eric, joins me for a morning on the greens of nearby Highland Lakes Golf Club, a nine-hole public course at Inks Lake State Park overlooking scenic Inks Lake.

For More Information

Longhorn Cavern State Park
(877) 441-CAVE
<www.tpwd.state.tx.us/park/longhorn/>

Inks Lake State Park
(512) 793-2223
<www.tpwd.state.tx.us/park/inks/>

Canyon of the Eagles
(800) 977-0081
<canyonoftheeagles.com>

Boss Stripper Guide Service
(512) 515-6518
<bossfish.home.texas.net>

Lake Buchanan/Inks
Lake Chamber of Commerce
(512) 793-2803
<highlandlakes.com/chamber/>

But after donating my last remaining ball and last ounce of patience to the water hazard on the sixth hole, I am ready to trade in my clubs for a rod and reel. We refuel with a pre-packaged turkey sandwich and soda from a nearby convenience store, and are off to try our luck striper fishing on Lake Buchanan.

As we approach the end of the pier to load the boat, our guide, Bas, owner and operator of the Boss Striper Guide Service, greets us. A 10-year-old boy fishing at the end of the pier dangles his muddy, untied sneakers over the edge, waiting patiently for a small perch or crappie to nibble on his line. A skinned knee and unkempt hair provide convincing evidence that he's making the most of his family's weekend retreat.

An excursion with Bas earlier today proved successful for the young fisherman. Relishing the opportunity to show off his prize catch to a new crowd of admirers, he flashes a proud grin as he hoists a 30-inch striped bass high above his head.

Initially, all I wanted was a relaxing afternoon puttering around the lake, soaking in some rays, and maybe catch-

ing a few fish. Now, however, enviously eyeing the boy's silver trophy glittering in the sunlight, I can feel my competitive spirit begin to stir.

At 18 to 25 inches, our first few catches are hardly anything to complain about. Set up with four downriggers, which secure the rods and troll the line at a depth of about 25 feet, we kick back and chit-chat as we wait on the fish to bite. Our progress is sporadic but steady, and Eric and I take turns reeling fish in.

Late afternoon, Bas spots a group of gulls circling and diving in the distance, and heads that way to get in on the action. Like silver bullets breaking through the surface, hundreds of stripers blanket a quarter-mile radius, flipping and flailing in a mad feeding frenzy. Our lures prove appetizing, and in seconds all four rods droop. For the next 20 minutes, it's all we can do to get the lines re-rigged and back in the water before reeling them right back in again.

Then in an instant the fish disappear, and the water is as smooth as glass. With almost our daily limit in tow, the calm after the storm leaves me doubtful that I'll be bringing back any trophies

today. Winding down from our adrenaline rush, we ride into a pink September sunset as we head back to the dock.

Amid the jovial recaps of the day and an Eagles tune blaring from the radio, it's a wonder we even notice one of the rods, bent like a half moon over the back of the boat. The line hisses at the formidable force on the other end. Could this be it?

For what seems like an eternity, I fight to bring it in, the pole digging into my hipbone as I struggle for more resistance. It's more than I can handle, and Eric steps in for the finale.

Every bit of 29 inches, this striper's a trophy in my book, though one inch short of a mounter by Bas' standards.

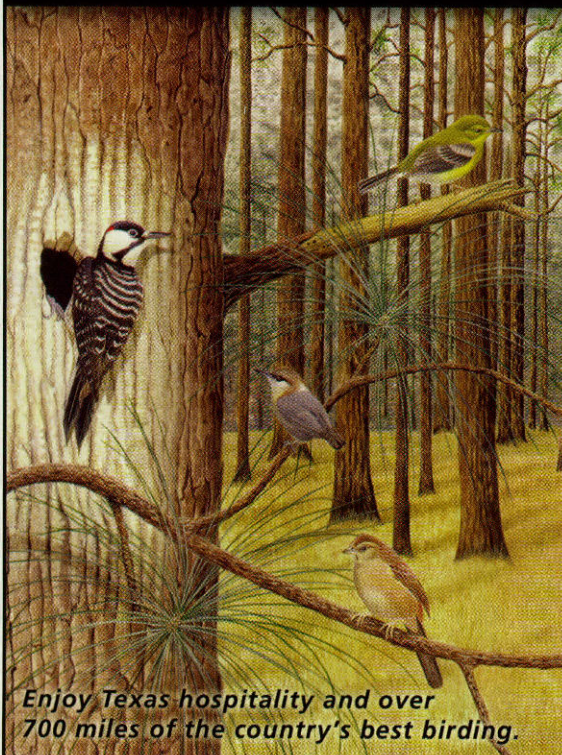
As we pull up to the dock, the boy's crooked grin welcomes us. By now my competitive spirit has subsided, and I humor him with regrets that we didn't catch a fish as big as his. Pleased with himself, he helps us unload the boat.

My smile is genuine as we pose for pictures with the day's impressive harvest. His memories will hang on a wall; mine will fill a scrapbook. ★

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RANGE OF THE RIO GRANDE

HERE'S A SHORT PRIMER ON THE LIVES AND LOVES OF TEXAS' ORIGINAL WILD TURKEY.

BY LARRY D. HODGE
PHOTOS BY WYMAN MEINZER

THE WILD TURKEY

has been called the most challenging of North American game, and having been played the fool by more toms than I care to admit. I would not dispute that claim. But the Rio Grande subspecies — found in its greatest numbers in Texas — is much more than just a difficult quarry. It is a bellwether of the environment and the crown

jewel of the Texas outdoors. If there is a prettier sight than a gobbler strutting in a field of bluebonnets, I have yet to see it.

I hunted my first Rio Grande in the heart of its range, the Texas Hill Country. So adaptable is this species that one can find them from northern Mexico to Kansas. Even though sound wildlife management practices do not include introducing species into areas outside their natural range, birds transplanted from Texas roam the slopes of Mauna Loa in Hawaii, and small numbers occupy limited ranges in other

states. Yet their natural range is narrow, occupying roughly the southern half of this country's plains region in an area wedged between eastern forests and western deserts and mountains.

For all their adaptability, Rio Grandes need trees but not too many trees, open country but not too open, dry but not too dry. Country that receives between 20 and 35 inches of rainfall a year suits them best, and they don't do well where snow frequently covers the ground. In Texas they can be found roughly west of Interstate 45 and east of a line from Fort Stockton to Amarillo, although I've seen a flock roaming downtown Balmorhea and have photographed Rio Grandes crossing Calamity Creek on the Elephant Mountain Wildlife Management Area south of Alpine.

Appropriately for a bird named for a river, water plays a major role in the life of Rio Grandes. Rios prefer brushy areas near streams and rivers and appear, like white-tailed deer, not to have expanded into much of their present territory until after human suppression of fire enabled trees and brush to spread far from watercourses. They roost in the largest trees they can find, which also tends to concentrate them along



streams. Bottomlands also generally provide better and more dependable food sources. And nesting hens rarely brood farther than a quarter to half a mile from water.

Besides the spread of brush into grasslands, two other modern developments led to the expansion of the Rio Grande range. Turkeys followed in the tracks of cattle as Texas ranchers spread westward and drilled wells to provide water for livestock. But perhaps the oddest thing to benefit Rios seems at first glance to be likely to do just the opposite: oil wells. As oil fields in West Texas sprouted derricks and electric transmission lines carrying power to the pumps, turkeys found predator-proof roosting places where none had existed before, and they moved right in. In some cases turkeys roost on power lines and oil tanks in such numbers as to be a nuisance, though occasionally one makes the mistake of touching two wires at once and pays the ultimate price.

While availability of water for drinking partly determines where turkeys can live, ultimately their survival depends on rainfall. Into every turkey's life some rain must fall — and it must come at the right time. Like all creatures, turkeys need food, water, cover and space in order to live, and three of those four essentials depend largely on rainfall — especially late summer and early fall rains. Plentiful rains, often from hurricanes and tropical storms, set the stage for good times for turkeys. Dependence on water begins early: Eggs are 71 percent water, and each contains just enough liquid — given the

proper weather conditions and care from the hen — to develop its embryo.

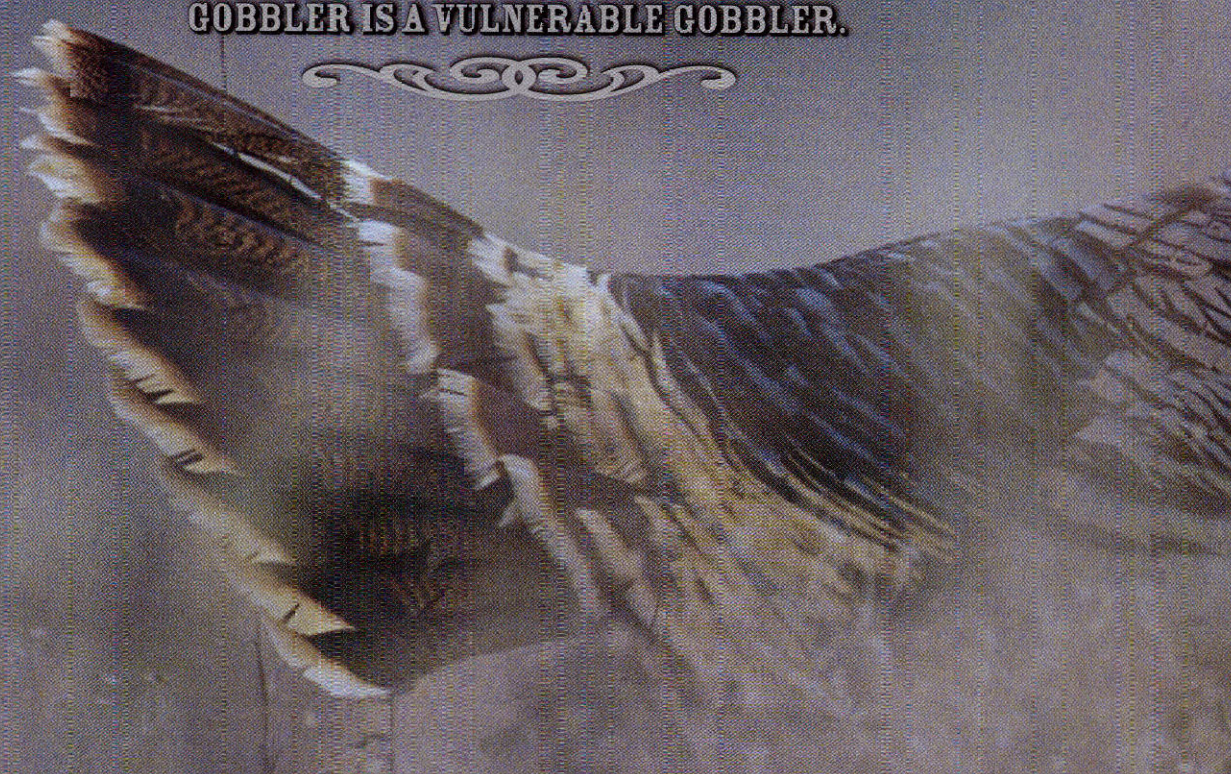
The ideal conditions for turkey reproduction occur only in spring. At this time of year, moisture from fall rains lingers in the soil and brings on a bumper crop of forbs (weeds and wildflowers). Keen observers know that a good winter wheat crop in the Rolling Plains and abundant wildflowers in the Edwards Plateau generally accompany a good hatch of Rio Grande poults.

Heavy vegetative cover promotes nesting success by concealing eggs from predators and producing an abundance of insects. Turkey hens can obtain the high level of protein necessary for best reproduction from only one natural source: bugs. Laying hens get the calcium they need to produce eggshells from snails that feed on weeds. Poults depend almost exclusively on insects during the first weeks after hatching. One researcher estimates that each two- to three-week-old poult consumes 3,600 insects daily. Watching a flock of poults chase insects gives a whole new appreciation for the expression "grab a bite to eat."

An egg is an amazing thing, a self-contained life support system that carries within its protective wall everything needed to create a new turkey. Once an egg is laid it needs only two outside ingredients to carry out its mission: heat and humidity. And therein lies the problem — and the magic.

Turkey eggs remain viable only within a fairly narrow range

AS MORE HENS ARE BRED — AND IN TEXAS ABOUT HALF ARE BY OPENING DAY OF THE SPRING SEASON — THE GOBBLER INCREASINGLY FINDS HIMSELF ALONE IN LATE MORNING AND EARLY AFTERNOON. A LONESOME GOBBLER IS A VULNERABLE GOBBLER.






of temperature. Hens lay one egg a day, sometimes skipping a day, until the clutch numbers eight to 12 eggs. During this time the hen is away from the nest most of the time and continues roosting in a tree at night. A late spring cold snap can chill the eggs and compromise hatching success. An early warm spell can begin embryonic development before the hen starts brooding. Development of the embryos inside the eggs does not typically begin until the hen begins nesting full time and maintains a fairly constant temperature of about 99.8 degrees and relative humidity of between 55 and 60 percent. Under these conditions the eggs will hatch in 26 to 28 days — if all goes well. Motherhood is tough on turkeys. By one estimate between 50 and 70 percent of turkey hens and 60 percent of poults are killed by predators during the time the hen spends her nights on the ground incubating eggs and caring for poults too young to fly.

Even though the eggs are laid as much as two weeks apart, they all hatch on the same day. This improves the odds of survival for the poults. But how does the hen manage to pull off this minor miracle? She may actually have nothing to do with it at all. Researchers at Texas A&M University believe that the embryos inside the eggs communicate with each other by peeping and that the sounds somehow stimulate all the poults to break out of their eggs at the same time.

Sound continues to play an important role in turkeys' lives as they grow older. (Any hunter who has made the mistake of clicking off a shotgun safety within 50 yards of a turkey knows they hear as well as they see.) A hen molds her poults into a flock within hours after hatching by clucking almost constantly. She is the center of their universe, and her clucks, trills, purrs and putts keep them in close orbit around her. Oddly, hens do not recognize the voices of their own poults, but every poult knows the sound of its mother.

This ability to discriminate between the sounds made by different turkeys bears much import for hunters. On the negative side, turkeys probably can learn to recognize the calls made by individual hunters or perhaps even particular types or brands of calls. That's why it's commonly said by turkey hunters that you cannot own too many turkey calls. If one doesn't bring a tom within range, another might. Turkeys that are hunted hard may also become call-shy. On the positive side, using several calls in quick succession when hunting can sometimes convince an ambitious gobbler that several hens desire his company, and he may well come to investigate.

Getting a gobbler to come to you is the ultimate goal and thrill of spring turkey hunting, whether you do it with a gun or a camera. Toms gobble to advertise their location to hens, and the normal procedure is for the hen to go to the gobbler. However, patient hunters can make turkey behavior work to their advantage. As soon as turkeys fly down off the roost in the morning, gobblers begin displaying for hens and breeding receptive ones. Once the hens begin laying, they typically leave the gobbler during the middle of the day to visit their nests and lay. As more and more hens are bred — and in Texas about half of them are by opening day of the spring season — the gobbler will increasingly find himself alone in the late morning and early afternoon. A lonesome gobbler is a



IN 1903 TEXAS INSTITUTED A BAG LIMIT OF 25 TURKEYS PER DAY DURING A FIVE-MONTH SEASON. NOT UNTIL 1919 WAS ANYTHING CLOSE TO THE CURRENT BAG LIMIT IMPOSED—THREE GOBBLERS PER SEASON, COMPARED TO TODAY'S FOUR.

vulnerable gobbler. So that's why afternoon hunting can often be successful when morning hunting is not.

Within the limits of its natural range, the Rio Grande turkey is a remarkably hardy survivor. However, they remain totally dependent on human cooperation for their continued existence. Turkeys appeared in Texas some 11 million years ago, according to the fossil record, yet it took little more than a century of exploitation to reduce their numbers to a few thousand. In 1897 trapping was banned, but only for five months of the year. In 1903 Texas instituted a bag limit of 25 turkeys per day during a five-month season. Not until 1919 was anything close to the current bag limit imposed — three gobblers per season, compared to today's four. With determined habitat protection and improvement by private landowners, elimination of market hunting, restricted harvests and restocking efforts by TPW, Rio Grandes number more than 500,000 in Texas today — 50 times the number of turkeys of all species found in North America in 1900.

A persistent myth of American history is that Benjamin Franklin championed the wild turkey (the eastern variety, not the Rio Grande) as the symbol for the nation's seal. This was not the case, according to the definitive work *The Wild Turkey: Biology and Management* (Stackpole Books: 1992). Franklin did complain that the artist in charge of creating one of the early images of the bald eagle for the seal produced something that looked more like a turkey than an eagle, and in a digression forgivable of an old man in his dotage, went on to enumerate the bad points of the eagle and the good points of the turkey. But this was done in a letter to his daughter in 1784 — years after the eagle came to adorn the nation's seal.

The Rio Grande, however, because of its majesty, beauty and close connection to the state, might well be called the national bird of Texas. ★

Wildlife editor LARRY D. HODGE has been chasing turkeys for 10 years, and he wishes he'd started sooner.

TALKING TURKEY

HOW MUCH (or little) do you know about wild turkeys? ANSWER TRUE OR FALSE to the following questions. Some of the answers may surprise you. But don't be a turkey and peek before answering!

- 1 TURKEY POULTS WILL ONLY RECOGNIZE THE HEN THAT HATCHED THEM AS THEIR MOTHER.
- 2 TURKEYS CARRY A "MAP" OF THEIR HOME TERRITORY IN THEIR HEADS.
- 3 YOU CAN TELL A GOBBLER FROM A HEN BY LOOKING AT ITS DROPPINGS.
- 4 IT'S EASIER TO HUNT TURKEYS FROM AN ELEVATED BLIND THAN BY SITTING IN PLAIN SIGHT ON THE GROUND.

- 5 TURKEYS CAN SWIM BEFORE THEY CAN FLY.
- 6 THE SCIENTIFIC NAME FOR THE RIO GRANDE TURKEY, *MELEAGRIS GALLOPAVO INTERMEDIA*, COMES FROM THE FACT THAT ITS RANGE FALLS BETWEEN THAT OF EASTERN AND WESTERN SUBSPECIES.
- 7 TURKEYS ARE NATIVE ONLY TO NORTH AMERICA.
- 8 PARTRIDGES, QUAIL, GROUSE AND PHEASANTS ARE CLOSE RELATIVES OF THE TURKEY.
- 9 WHEN FEEDING, A WILD TURKEY SCRATCHES IN THE DIRT ONCE WITH THE LEFT FOOT, THEN TWICE WITH THE RIGHT.
- 10 WILD TURKEYS CAN LIVE TO BE 10 YEARS OLD.

a lot more movement — though still not much — at ground level. 5. TRUE. They can swim at the age of only three or four days and fly at about a week. This enables them to keep up with the hen when she crosses creeks. The bugs are always juicier on the other side. 6. CLOSE, but not quite. The *intermedia* in the name refers to the coloration of the Rio Grande's tail and rump feathers, which are lighter than those of the eastern turkey but darker than those of the Merriam's or Gould's. 7. AGAIN, CLOSE, but not quite. There are two species of wild turkey. The North American turkey has five subspecies (one of which is the Rio Grande). The Central American wild turkey, the ocellated, is the other species. 8. TRUE. All these birds are what are called gallinaceous fowl, which means they prefer to feed by scratching in the dirt. 9. SO SAY THE EXPERTS. Hunters can use this knowledge to their advantage when calling gobblers by scratching in leaves to simulate a feeding hen, helping to convince a gobbler to show himself. 10. TRUE, but this is highly unusual. Most turkeys live only to age 2 or 3. A 3-year-old tom is a true trophy for a hunter and can generally be identified by spur length. Spurs over an inch long generally indicate a bird 3 years old or older.

1. FALSE. Poults will imprint on, or recognize as their mother, the first creature that provides them with parental care — even a human being. In fact, this is how some of the most detailed observational studies of turkeys have been carried out, by imprinting poults on the researchers. Even strange, poults assign a sexual identity to "their" human during their first year of life and thereafter react to the person as they would to a turkey of the same sex. 2. TRUE. As a veteran turkey hunter once told me, "When you call to an old gobbler, he not only knows where you are, he knows exactly what bush you are behind. That's why you have to sit so still when hunting turkeys." 3. TRUE. This is very helpful when scouting. A gobbler's droppings are usually in the shape of a J or an L. Hen droppings are looped, spiral or bulbous. And while we're on the subject, did you know that turkey droppings include not only feces but also urine? As with reptiles, the "white stuff" in turkey droppings is urine. 4. FALSE, provided you wear camouflage and keep still. Most turkey danger comes from above in the form of hawks and owls, so they are extremely wary of movement above them, even the slightest flash of a face or hand in the opening of a blind. You can get away with

ANSWERS



The young Greek goddess of hunting, Artemis, is said to have been an exceptional markswoman, fearless in the wild and blessed with an understanding of wild creatures.

Raising Artemis

My daughter Lindsey would have liked her.

*By Sheryl Smith-Rodgers
Illustration by Cindy Wrobel*

When

I think back on how I used to stomp woolly bear caterpillars just to see what color would ooze out, I shudder. That memory of myself as a 5- or 6-year-old just doesn't fit with the rest of me. I remember crying a few years later when I accidentally ran over a black scarab beetle with the tire of my Western Flyer bike. To this day, I cringe every time I hit a butterfly as I'm driving down the highway.

I just don't like to kill things.

AS YOU MIGHT GUESS, I've never developed a real affection for hunting or fishing. Oh, I hooked a few bass and had fun while I was dating a park ranger back in '78, a guy I later married and have kept around for 20 years. But I've just never been the kind of gal who looks forward to sitting in a tree on opening day or standing on a jetty waiting for the big one to find my hook.

When I joined the Texas Outdoor Writers Association four years ago, I felt out of place at first. My contributions to outdoor writing covered such tame topics as nature, state parks and environmental issues. All the other association members (mostly men) hunted and fished avidly, and they wrote exten-

never marry a man who golfed or liked football. I didn't. Instead, I married an outdoor enthusiast, which — at the time — I thought was safe.

It didn't take long for me to see the light, though. Sure, I could thank my lucky stars that the glow of Monday Night football didn't radiate from our house once a week. But meanwhile, the stacks of Terry's fishing magazines and hunting catalogs were reproducing at a phenomenal rate under our bed and all over the coffee table. Plus, the man disappeared for weeks at a time during the fall.

When the first child arrived in '87, I began to resent his absences. Staying at home with a colicky baby who rarely, if ever, napped stretched my patience and sanity to razor-thin.

Then my 8-year-old daughter, Lindsey, bagged a feral goat. I felt redeemed. If I couldn't hunt myself, at least I could say my daughter did.

sively about those sports. Lures and bait, saltwater and fresh, caliber and cartridges — TOWA-ers spoke a different language, one I heard my husband speak often at home. Still, nearly everything they discussed at TOWA conferences went over my head.

Then my 8-year-old daughter, Lindsey, bagged a feral goat.

I felt redeemed. If I couldn't hunt myself, at least I could say my daughter did.

My father never hunted or fished, either. To this day, he still prefers to spend Saturdays on the golf course and Sundays watching football on television. Growing up, I vowed I'd

When Patrick did nap, those blissful interludes usually lasted a mere 20 minutes, a half-hour tops. I was exhausted. Knowing that Terry was sitting alone in an oak tree, surrounded by total solitude and communing with nature, did little to improve my grumpy disposition. I was sorely tempted to take up hunting myself.

But I didn't.

Instead, I had a second baby four years later. I couldn't have been happier when the doctor exclaimed, "It's a girl!" Now we had one of each — a son for Terry, a daughter for me. But what I really had was two kids to entertain while Terry took

his occasional hunting and fishing trips. Thank goodness Lindsey at least took authentic naps and her older brother could color now.

After Patrick passed the preschool stage, he developed a strong interest in animals. He started with a small aquarium and two goldfish from my father's pond. Before I knew it, the menagerie in his bedroom had expanded to three aquariums stocked with assorted fish and a plastic habitat filled with hermit crabs.

Not content to keep critters contained to his bedroom, Patrick branched out to the backyard and started accumulating rabbits. After awhile, just feeding them got boring, so he "married" a few, and then we had many tiny rabbit children, which — naturally — grew up and got married themselves.

It didn't stop there. A trip to buy a used rabbit cage produced yet another new family member — J.J., a grouchy red-rumped parakeet that needed a home. Desperately. After a few days with him, I understood why.

When he died a few years later, Patrick got Sterling, a cockatiel, for his birthday, and then one of those dime-store parakeets he named Alex. Meanwhile, I was becoming somewhat acquainted with Mrs. Bigglesworth, the cunning crawdad in Patrick's aquarium that occasionally escaped and met me in the hall with pincers raised in combat position.

Suffice it to say that Patrick has never had the faintest interest in hunting. Now and then, he'll fish with his father on the coast, but that's it. Like his grandfather, he's a big football fan.

Then they practiced firing the gun nearly 100 times to condition Lindsey to handling it.

Soon after settling in their blind, a small eight-point buck walked up within 20 yards.

"Lindsey got buck fever," Terry tells. "So she didn't get a shot off. Then 45 minutes later, a bunch of does showed up. She was so excited and shaking that she couldn't shoot again. More does showed up. Then she calmed down enough to make a shot. We looked for signs of a hit, found some hair and a little blood. She had grazed the doe. So I sent Lindsey back to the stand while I searched. Fifteen minutes later, I heard the sound of feral goats coming. I tried to make it back to the blind as fast as I could. On the way, I saw goats on the opposite side of the blind and Lindsey looking at me. She mouthed, 'Can I shoot?' I nodded, then I heard the sound of a blast."

Lindsey had shot one of the largest feral goats in the herd. "Daddy, I got it! I got it! I got it!" she exclaimed, jumping up and down. "Daddy, I did good!"

She'd made a perfect shot through the base of the neck. There in the field, Lindsey and her father gutted the goat. "I just thought it was great that she would do that," Terry says of Lindsey's first hunt.

The next time the two went out was a year later during another youth hunt. For an hour and 15 minutes, they watched a buck tend a doe approximately 20 yards away. During the courtship, Terry explained the different rituals, such as why a buck rubbed a nearby tree limb with his antlers

The door slammed, then Lindsey zipped by and headed up the stairs to her room. "I'm going to get a jacket so I can help Daddy skin it out!" she hollered over her shoulder.

Lindsey is a different story. At an early age, she actually looked forward to her father coming home with a deer to skin and butcher. I'll never forget one evening when she saw the red tail lights of Terry's pickup backing up the driveway. That always meant one thing — we'd soon have a carcass hanging from the carport ceiling.

"Did Daddy get something?" she asked me hopefully.

"Yeah, looks that way," I said with a sigh.

"Yippee!" she exclaimed, and then raced out the back door. In the cool night air, the two stood together, admiring Terry's first harvest of the season. I stayed in the house. So did Patrick. Naturally.

The door slammed, then Lindsey zipped by and headed up the stairs to her room. "I'm going to get a jacket so I can help Daddy skin it out!" she hollered over her shoulder.

"Hurry up!" Terry called from the door. "I'm getting ready to cut out the heart."

"Wait for me!" she wailed in return.

At my desk, I shuddered and laughed at the same time. No way would I go out there, but I was sure glad Lindsey would.

The first time Terry took Lindsey hunting was December 1999, when the pair got drawn for a youth hunt at Pedernales Falls State Park. She was 8. Before the big day, they loaded special bullets (Barnes X) for her gun, a single-shot .223.

and glands. Lindsey enjoyed the heck out of watching the pair, and she learned a lot. But when it came time to shoot, she declined. She just didn't want to, and she didn't volunteer a reason why.

When we ask if she'd like to hunt this year, Lindsey shakes her head no. However, she'll go out with her dad, sit in a blind again and watch the deer (and all the other animals). That's fun. Because she's still young, I think Lindsey could change her mind and get buck fever again. Time will tell. Either way, it's just fine with Terry. He'll never force hunting or fishing on either of our children. They both will make their own choices, he says.

In the long run, Terry hopes very much — and I do, too — to instill a deep love and reverence for the outdoors in Patrick and Lindsey. That's what matters most.

And who knows? Maybe 10 years from now, a handsome young park ranger who enjoys hunting will come along, and Lindsey will suddenly remember that, hey, she loves hunting, too! ☆

SHERYL SMITH-RODGERS is a freelance writer/photographer who writes for a number of newspapers and magazines. The Rodgers family lives in Blanco State Park, where Terry is the park manager.



*Catch the new wave
at Monahan's*

Sand

I HAD NOT PLANNED ON BEING IN A RUSH as I completed my West Texas road trip last spring. But there I was, speeding toward Monahans Sandhills State Park after a few days in Big Bend National Park, hoping to catch a glimpse of a little-studied species of recreationist known as a sandrider, sand-boarder or sand surfer. I had heard rumors of these distinctive dune-bound athletes — brothers to the skateboarders found cruising urban landscapes and sisters to the snowboarders found carving on snowy mountain slopes — but I had never seen one in the flesh. Alas, I arrived too late to catch local families sliding along the Monahans Sandhills — a sight I was certain would put me on the fast track to understanding the appeal of this not-so-lonely state park, which draws nearly 100,000 visitors each year.

**of extreme sports
Sandhills State Park.**

Blast

By Dan Oko



On that fateful afternoon,


it appeared as though everybody but me had decided to dodge the heat and abandon the beautiful-yet-barren Monahans Sandhills in favor of shadier spots and air-conditioned enclaves. The native shin oak, a tree common to the area that rarely grows more than three feet tall, wasn't going to provide respite from the glare of the sun. About 30 minutes west of Odessa and a stone's throw from Interstate 20, the 3,840-acre park struck me, as it has many others, as a beach without water. Rolling dunes of translucent sand spread across the horizon in waves that recalled the inland sea that once occupied the Permian Basin where I now stood. Clumps of grasses swayed in the breeze. The horseback riders and birdwatchers who sometimes visit Monahans were nowhere to be seen. As the sun bore down, I found myself sharing the park with three college coeds working on their tans, not a sand surfer in sight.

While sandboarding has been around as a niche sport for decades, it has enjoyed a renaissance in recent years. Sandriders practice the art of navigating down a dune on a laminated plank in a manner that is nearly identical to big-wave surfers

harging 10 on ocean swells. Television commercials flash scenes of sand surfers set to rock-and-roll soundtracks. Web sites devoted to the sport have begun to pop up, including the online *Sandboard* magazine, <www.sandboard.com>, <www.venomousboards.com>. Extreme-sporting types looking to expand the world's play-grounds have formed Dune Riders International, a fledgling advocacy group "dedicated to the preservation of earth's dune systems for recreational and competitive sandboarding." And from South Africa to Germany and Peru to California, competitions have been sprouting like, well... beach grass through the dunes, boasting events such as rail slides, cliff jumps and slalom races.

DOWNHILL RACER

Unfortunately, while I was there, the chance of my witnessing anybody practicing such tricks at Monahans Sandhills looked slim. Left to my own devices, I rented a plastic disk at the recently renovated Dunagan Visitor Center — the same sort of primitive sled we used on snow during my Yankee childhood — and, armed with a chunk of wax, I bade farewell to my inhibitions. From a likely looking ridgeline, I plunged headlong down a gently graded dune. After about 12 feet, the platter I rode sank quickly into



Odessa resident Thomas Rodman, 71, shares Monahans' dunes with younger sandriders.

the sand, pitching me down the hill and filling my collar with fine, pale granules. Peals of feminine laughter rained down from above. Ignoring them, I returned to my launching point and tried to guide my surfing apparatus from a sitting position. This resulted in a longer run, though once again I failed to reach the bottom, and felt none of the excitement associated with sports such as skiing and surfing.

Finally, I made my way to the apex of yet another, taller dune, a spot promising a steep leeward slope of some 60 feet or so to the bottom. Again, I launched myself headfirst down the hill. As I sped to the bottom, I imagined this might be as good as it gets: The low-key thrill left me feeling more like a kid in a sandbox than an intrepid adventurer, but it was good fun, nonetheless. After a few more successful runs, now parched and no longer so curious about the mysteries of sand surfing, I returned my "board" to the visitor center and retreated to my campsite.

THE SANDS OF TIME

Obviously, this sort of recreation is a relatively recent development at Monahans Sandhills. Geologists tell us the dunes were formed some 10,000 years ago. They extend from the Monahans area north almost 200 miles, into New Mexico. The shifting mosaic of sand, which originated in the ancestral floodplain of the nearby Pecos River, continues to provide scientists with clues as to the early life among the dunes. Primitive human remains going back to the sandhills' inception have been unearthed nearby, and as the sands move before the prevailing seasonal winds, ancient arrowheads and other artifacts have been unearthed. In the past, the sands also revealed the bones of mammoths, giant bison, camels and other extinct animals known to us by their skeletal remains alone.

Through the first half of the 19th century, European settlers tended to avoid the dunes, which were difficult to nego-

tiate via wagon train and also harbored Native Americans, some of whom did not view these paleface newcomers entirely sympathetically. The Comanche tribes were among those who early on discovered the treasures hidden in these sandy hills, relying on the large acorns of the indigenous shin oak as well as on mesquite beans as food sources. The shin oak, despite its diminutive size, is not a dwarf version of another species but simply a small tree. Reliant on water deposits stored underneath the dunes, their roots can plumb depths of up to 70 feet. At Monahans, the shin oaks form a unique, full-scale forest in miniature.

In his 1850 report to the U.S. Secretary of War, Lieutenant N.H. Michler presciently described the dunes: "They are a perfect miniature Alps of sand: in the midst of them you see summit after summit spreading out in every direction, not a sign of vegetation upon them — nothing but sand piled upon sand." About 30 years after the army completed its survey, subterranean wells were discovered at Monahans, and the Texas and Pacific Railroad selected the nearby settlement as a watering stop. In 1928, oil was discovered in Ward County, and petroleum replaced ranching as the region's foremost industry. Today, Monahans Sandhills is one of several state parks that feature productive oil wells and working pump jacks, says superintendent Glen Korth, who has worked at the park since 1997.

Moreover, because Monahans Sandhills is one of the only places in the region where the public can access these dunes, many visitors aside from sandriders come to this spot. The park allows horseback riding on nearly 600 acres, and offers rides in a newfangled military jeep. The sandhills are also part of the Central Texas flyway, which means birdwatchers can find a variety of species, especially after rainfall fills the ponds sequestered in the hills. Avian residents include the burrowing owl and roadrunners, while colorful neotropical migrants can be found during fall and spring migrations. Wildlife watchers

"We're an uncommon breed," says Thomas Rodman of Odessa, who at age 71 may be the world's oldest living sandrider. The hobby seems to be keeping him preternaturally youthful.

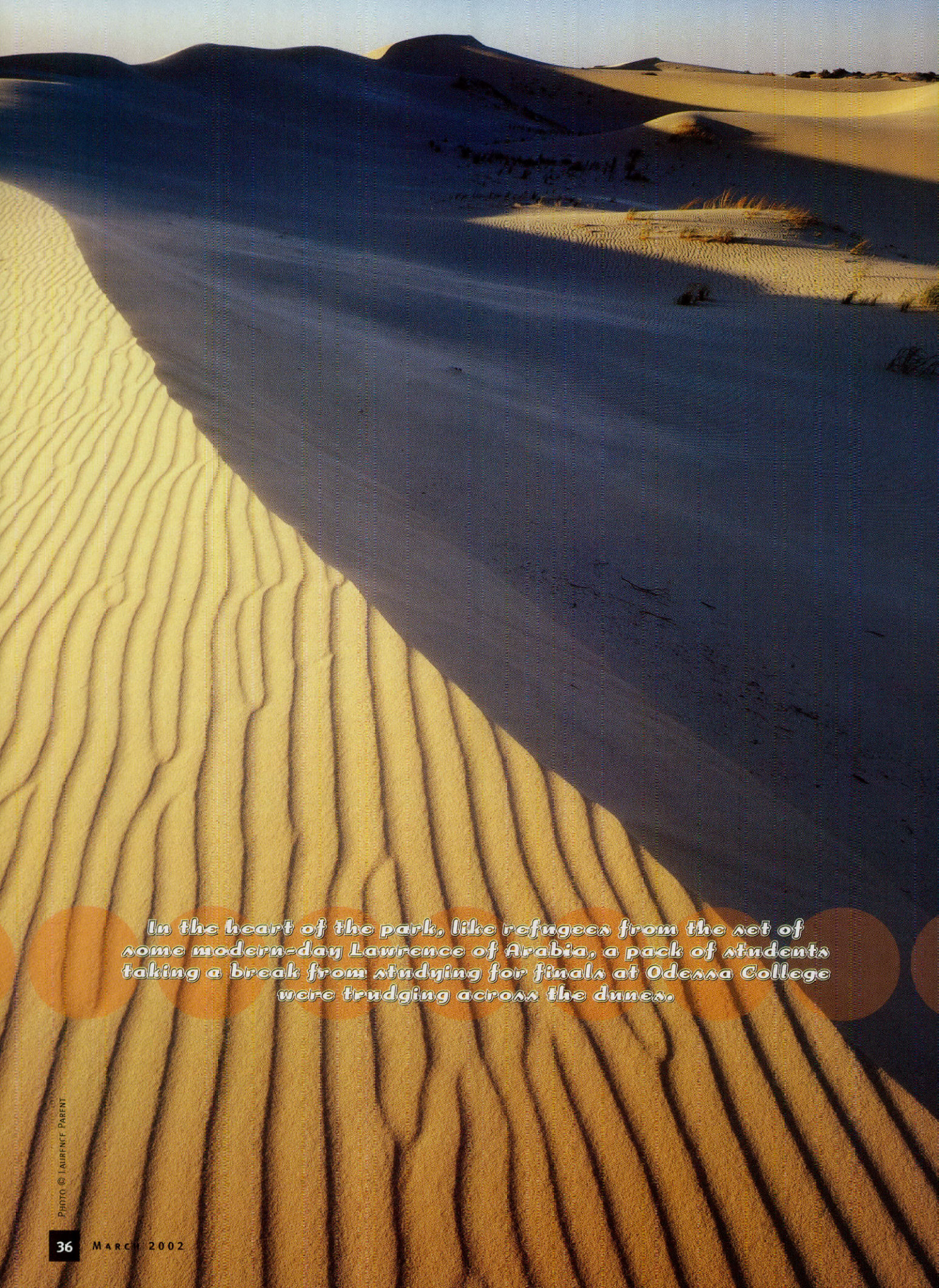
DUNAGAN VISITOR CENTER

VISITORS TO MONAHANS SANDHILLS will not want to miss the refurbished Dunagan Visitor Center, which was dedicated in 1999 and named in honor of longtime park advocates J. Conrad and Kathlyn "Kitty" Dunagan. Inspired in part by legendary Texas naturalist Roy Bedichek, the late Conrad Dunagan was behind the earliest efforts to establish the park and, to this day, Kitty Dunagan acts as president of Friends of Monahans Sandhills State Park. The Dunagan Center offers visitors an opportunity to learn more about the natural forces that shape the park, its wildlife and history, and the building itself stands as a monument to the accomplishments friends groups can achieve.

To date, the Friends of Monahans have placed nearly \$250,000 in an endowment for the park. In addition, the Sandhills friends group raised \$160,000 — including a \$5,000 grant from Chevron — to help pay for

the nearly \$400,000 project. With its hands-on interpretive exhibits, wildlife dioramas and an enlightening video on the history of the park — not to mention the vast supply of rental sleds available to visitors who want to try surfing West Texas-style — it's easy to see what motivates Friends of Monahans to keep working to preserve this place.

When the Dunagans first set to work establishing the park as a public resource at the end of the 1940s, there was no place Texans could access the Monahans dunes. That changed in 1957, when the park first opened. By 1972, the state had taken complete control of the dunes. When the park faced the threat of closure in 1992, the Dunagans and others founded Friends of Monahans Sandhills and redoubled their fundraising efforts. They established the endowment, promoted the park by increasing activities and buying highway billboards — and ultimately increasing park visitation.



In the heart of the park, like refugees from the net of some modern-day Lawrence of Arabia, a pack of students taking a break from studying for finals at Odessa College were trudging across the dunes.

will want to keep an eye out for mammals, too, including mule deer, kangaroo rats, coyotes, bobcats, foxes and jackrabbits. Even those who fail to spot feather or fur can pick out tracks in the sand. Taking advantage of its relative seclusion and the absence of nearby city lights, park managers lately have begun hosting a series of stargazing parties.

For many, the ever-shifting sands themselves provide yet another source of fascinating entertainment. Says superintendent Korth: "It's ghostly the way the sand moves. It's real eerie sometimes, like a fog. I'll tell you, it's a unique feeling being out there when it blows around like that." He adds that the wind's capacity to rearrange the landscape — in some cases overnight — eliminates concerns over the impact of sand surfing on the environment. On the other hand, the park does caution visitors to avoid treading on the sensitive vegetation, which helps stabilize the dunes, including grasses such as sand bluestem, sand reed and the romantically named plains lovegrass. Yucca and cactus can also be found in the park.

THE SANDS OF TIME

"We're an uncommon breed," says Thomas Rodman of Odessa, who at age 71 may be the world's oldest living sandrider. The hobby seems to be keeping him preternaturally youthful. He's tall and lean, and though his hair is completely white, he walks with the bearing of someone nearly half his age. Rodman water-skis and recently began wakeboarding, a water-skiing offshoot requiring plenty of strength and agility. "Sliding down is great fun," he says of sand surfing. "It's also a great workout. For an older person, it helps you keep your sense of balance, and for someone my age that's especially helpful because people are always falling down and breaking bones. Of course, once you get to the bottom, getting back to the top takes some work, and that's where the workout comes in. Climbing back up the dune is great aerobic exercise."

In the lingo of board jocks of all stripes, Rodman would be known as "old school." A sandriding pioneer, he has worked with local cabinetmakers to improve his equipment, developing designs for bigger boards, adding metal fins to improve steering, and acting as an unofficial ambassador for the sport. For nearly 35 years, Rodman says, he and his family have been enjoying sand surfing. His best-ever ride to date carried him about 75 feet, which is about the limit anyone

could expect to travel at Monahans, where the dunes rarely top 70. To this day, Rodman tries to hit the dunes twice a week.

Before I left the park, though, I still wanted to garner a glimpse of the new-school sandriders who might join Dune Riders. As evening fell, though, my aspiration to make a connection with the young lions of sand surfing began fading like the setting sun. I took solace in the fact that the campground had been filling up with travelers on their way across the Great Plains — hey, this was a popular place after all — and the sights and sounds of the desert as nocturnal creatures began to awaken. A bright moon had begun to shine, and I realized that I had inadvertently timed my visit to catch the full moon. I hurried to the top of a nearby mound, and waited for the moon to come up over the horizon. That's when I saw them: In the heart of the park, like refugees from the set of some modern-day Lawrence of Arabia, a pack of students taking a break from studying for finals at Odessa College were trudging across the dunes.

As I approached, I could hear their whoops of celebration, and I watched from afar as they swooped down the dunes of luminescent quartz. They took turns riding a polished water-ski, a pair of wheel-less skateboard decks that had been smoothed to slick gloss on their bottoms, and a strange-looking Formica board with a small box for the toes of the front foot and grippy sandpaper on top to hold the rider's heels in place. As they carved the now-cool sand, a ride of 75 feet began to look like an eternity.

These young sandriders glowed with the adrenaline I had sought that afternoon. It didn't take much to convince them I wasn't going to bust them; anyway, they had done nothing wrong. Soon, I was whooping alongside them, flying down the dunes, attempting to turn this way and that, trying to spin the board in circles as I plummeted toward the base. My heart was still racing when my companions bade me good-night and scampered off like apparitions in the direction of the parking lot, leaving me to my campsite and dreams of sand-born adventures in the Sahara, along the Oregon Coast, at Monahans. I had arrived that day in a rush, but the next morning I was in no hurry to leave. ★

DAN OKO writes for *Outside*, *Men's Journal* and other publications from his base in Austin.



GETTING THERE

TO REACH MONAHANS SANDHILLS State Park, take I-20 west of Odessa for 27 miles to exit 86. Turn right (north) onto SR – Park Road 41. The park entrance fee is \$2 per person, 12 and under are free. Camping fees are \$9 for sites with electricity. For more information call 800-792-1112 or visit <www.tpwd.state.tx.us/park/monahans/index.htm>. For reservations call (512) 389-8900 or go to <www.tpwd.state.tx.us/park/parks.htm>

and click on "Reservations."

Sand toboggans and disks can be rented at park headquarters. Along with sand surfing, other park activities include hiking, picnicking, camping and bird and wildlife watching. The Dunagan Visitor Center fea-

tures hands-on exhibits of the cultural and natural history of the sandhills, including dune dynamics, Permian Basin heritage and wildlife habitat.

Dune Riders International is an organization dedicated to the preservation of the earth's sand dunes for recreational and competitive sandboarding. For more information about joining Dune Riders International, visit <www.duneriders.org> or call (760) 373-8861.

— Kim Tilley

FLO

WHEN IT RAINS,
IT POURS — AND THAT
CAN MEAN TROUBLE IN
THE MOST FLOOD-PRONE
STATE IN THE NATION. IS
TEXAS READY FOR THE
NEXT BIG ONE?



BY TODD H. VOITELER

At 5 a.m. on Oct. 17, 1998, Regina Campbell was awakened in her Cuero, Texas, home by heavy thunderstorms. The rain continued to fall into the next day, when Campbell received a call from her mother, who was in Louisiana. Her mother had heard on the television that there would be flooding around Cuero. Regina mentally calculated her distance from the Guadalupe River — two miles — and decided to ignore the warnings. By that time, the waters were already massing for the coming assault.

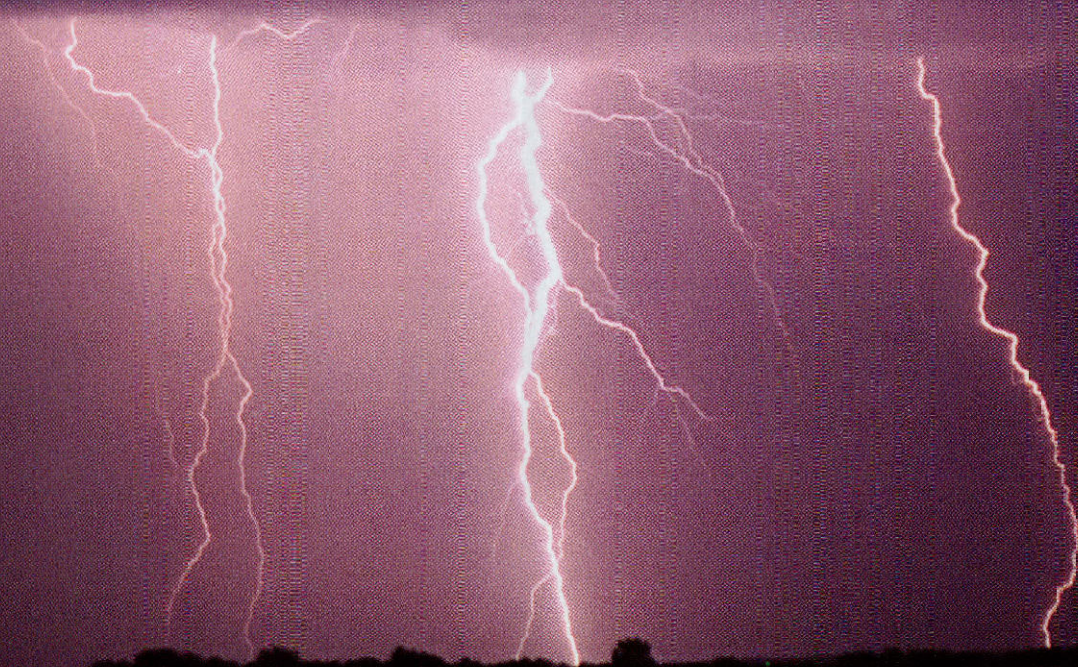
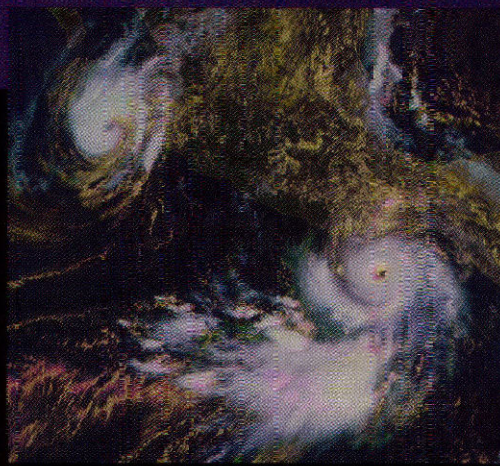


PHOTO © WYMAN MEINZER; SATELLITE PHOTO BY GOES PROJECT

Pacific hurricanes Madeline and Lester, above, contributed to the 1998 flooding that inundated the tube chute at Prince Solms Park in New Braunfels, right. The bottom photo shows the chute as it normally looks. In the top photo, at the same location, the chute is not visible.

BY DAWN ON OCT. 17, the storms that would later swell the Guadalupe had soaked an area from Hondo to New Braunfels with four to six inches of rain. An unusual combination of meteorologic conditions — a cold front, a low-pressure system and Pacific hurricanes Madeline and Lester — conspired to drop heavy rains. At the same time, a ridge of high pressure developed to the east, extending from the North Atlantic Ocean to the Yucatan Peninsula. Moisture was piling up over south-central Texas.

By noon some areas had received 15 inches of rain, with the heaviest rainfall extending into Hays and Travis counties. The soils, hardened from drought and high temperatures the previous spring and summer, quickly became saturated. By the time the rain passed, the San Jacinto, San Bernard, Colorado, Lavaca, Guadalupe and San Antonio rivers were flooding their banks.

The Nature of Texas Floods

A torrential rainfall like the one that fell on Oct. 17, 1998, is not an unusual event in Texas, where there is truth to the statement that when it rains, it pours. Unlike in most of the United States, where annual rainfall comes from a larger number of small precipitation events, Texas receives much of its annual rainfall in a few large storms. Automated U.S. Geological Survey (USGS) stream-flow monitoring stations have measured data on river flows that grew from zero to nearly half a million cubic feet per second in a single year. To get a picture of what that looks like, imagine a dry streambed surging over the course of a year to contain a flow equal to that of the Mississippi River as it passes New Orleans. These

extremes make predicting flood size and frequency in Texas a complicated proposition.

Why does Texas experience so many floods? The diversity of climate and geography renders the state vulnerable to both extreme droughts and floods. In this ancient climatic battlefield, cool, dry air moves in from the Rocky Mountains and confronts warm moisture from the Gulf of Mexico in the spring. The resulting thunderstorms have created world-record rainfall rates, such as the 38 inches that fell in 24 hours near Thrall in 1921. Heavy rains in the spring are particularly likely to cause flash flooding, because the ground is still cold and hard, and new foliage has yet to emerge. But even at other times of year, the clay-rich soils absorb water poorly, adding to the runoff produced during storms.

During the summer and fall, storms more often target the coast. Tropical cyclones spawned in the warm waters of the Gulf of Mexico, the Bay of Compeche, the Caribbean Sea — and occasionally the Pacific Coast off Mexico — can create two types of threats: storm surges along the coast and inland flooding. The storm surge produced by the Galveston Hurricane of 1900 — in which 6,000 to 10,000 people perished — made that hurricane the deadliest natural disaster in U.S. history.

But inland flooding can be equally destructive. In 1979, Tropical Storm Claudette dumped 43 inches of rain on Alvin, in Brazoria County. When Tropical Storm Allison struck Houston in June 2001, inland flooding caused 40 deaths and \$4 billion in damage. With advances in technology and the field of meteorology, storm surges are unlikely to catch forecasters by surprise. As a result, inland flooding now accounts for most flood fatalities from tropical cyclones.

The Waters Rise

By the afternoon of Oct. 19, the flood had advanced on Cuero. Campbell's husband called her at home and convinced her to take her children to higher ground. As she left, she could see the water approaching from down the street. A policeman ordered her to evacuate. Thirty minutes later, she returned to check on a friend. The water had risen to a depth of two feet and seemed to be coming from all directions. It was difficult to walk as the current pushed against her. She dodged garbage cans and Dumpsters that were being carried down the street by the flood. Later in the day, she saw a house floating down another street.



“EARLY ON THE MORNING of Saturday, Oct. 17, we knew that we had a major flood event on our hands,” says Bob Corby, a hydrologist for the National Weather Service’s (NWS) West Gulf River Forecast Center in Fort Worth. The NWS uses rainfall data, radar when available, and USGS stream-flow data for models that predict the magnitude and timing of a flood peak. When NWS anticipates a flood, its regional offices issue warnings. “While we were expecting heavy rains over the weekend, the rain began earlier than we had anticipated,” says Corby. “The Austin/San Antonio Weather Service Forecast Office in New Braunfels quickly responded by issuing flash-flood warnings and river flood



warnings for much of their area.”

Cuero was one of the epicenters of the October 1998 flood. “Flooding along the Guadalupe River, from Gonzales through Cuero and Victoria, was the most extreme,” says Corby. The heavy rains that pounded the New Braunfels area on Saturday morning created a flood wave that surged downstream along with the storm, compounding the flood’s severity.

Some of the heaviest rains fell over Peach Creek, a tributary without a USGS stream-flow gauge, which fed the flood crest at Cuero.

“The river became a giant chute,” says Corby, “and flood waters that normally follow the meandering floodplain began to flow on a direct path to the Gulf.” Consequently, he says, the flood crest reached Cuero faster than had ever been observed — in less than three days. “By the time the rainfall ended on Sunday,” Corby continues, “we were getting rainfall reports of up to 20 inches in some areas in the Guadalupe basin.” An area south of San Marcos received 30 inches of rainfall.

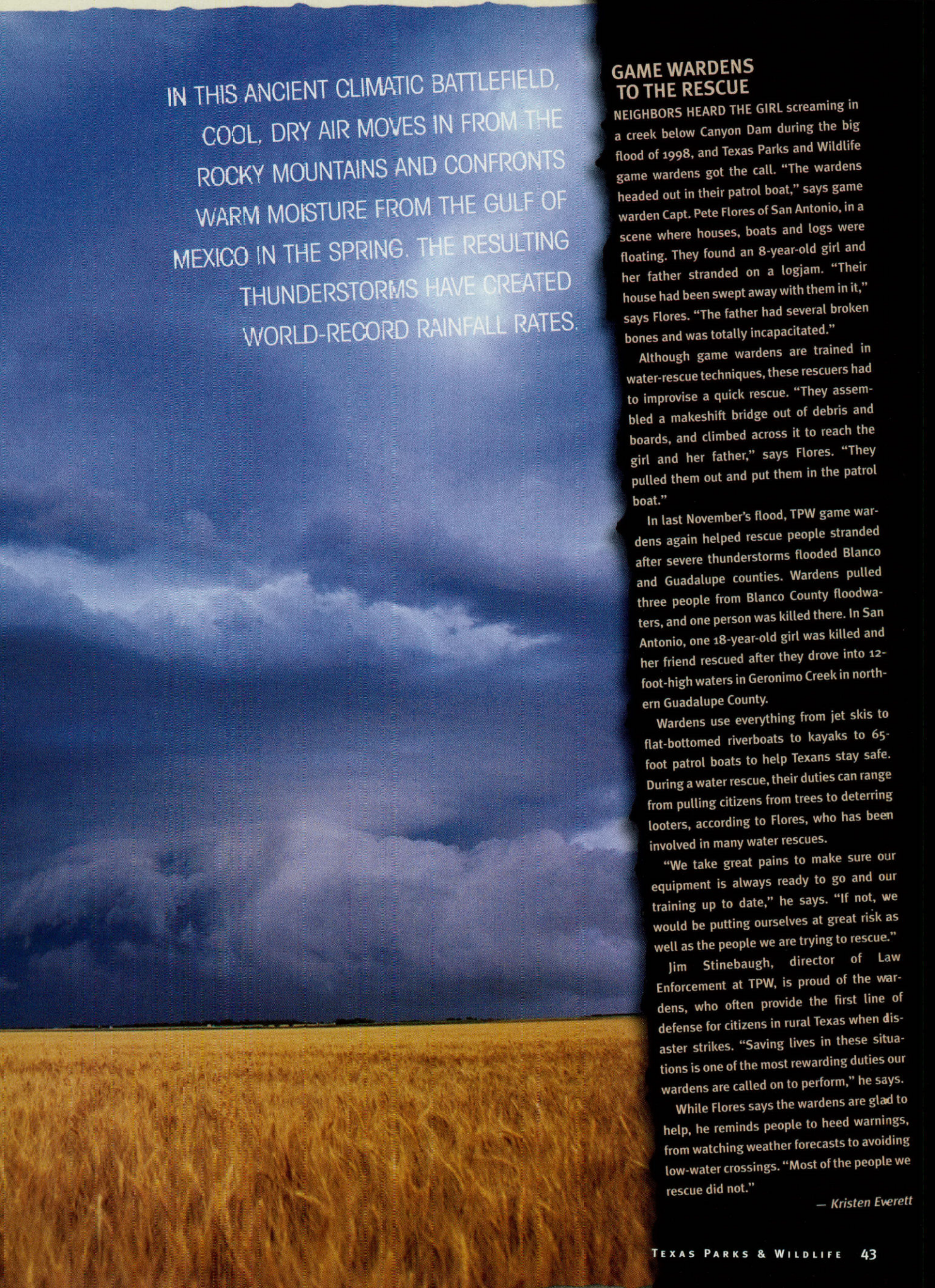
Flash Flood Alley

Historically, 70 to 80 percent of all natural disasters in the United States have involved flooding. Some 20 million of Texas’ 171 million acres are flood-prone — more than in any other state. Flash floods are the number-one weather-related cause of death in Texas. Most victims of flash floods fall into two categories: drivers trying to cross flooded areas, and children and young adults playing in or near floodwaters.

Because thunderstorms typically form during the most intense heat of the day, the resulting flash floods occur afterward — between late afternoon and early morning, when it is too dark to see the danger clearly. Even during the day, floodwaters may hide hazards such as damage to roadways, tree stumps, fire hydrants and other obstacles.

On a sunny day, a flood can sweep through neighborhoods from rain falling far upstream from a local watershed. Pushing a wall of debris made up of trees, cars and all manner of flotsam, flash floods become battering rams against houses, bridges and anything else that lies in their path.

Loop 337 runs just west of Dry Comal Creek, which seldom carries any water, above. That wasn’t the case following the 1998 flood, top.



IN THIS ANCIENT CLIMATIC BATTLEFIELD,
COOL, DRY AIR MOVES IN FROM THE
ROCKY MOUNTAINS AND CONFRONTS
WARM MOISTURE FROM THE GULF OF
MEXICO IN THE SPRING. THE RESULTING
THUNDERSTORMS HAVE CREATED
WORLD-RECORD RAINFALL RATES.

GAME WARDENS TO THE RESCUE

NEIGHBORS HEARD THE GIRL screaming in a creek below Canyon Dam during the big flood of 1998, and Texas Parks and Wildlife game wardens got the call. "The wardens headed out in their patrol boat," says game warden Capt. Pete Flores of San Antonio, in a scene where houses, boats and logs were floating. They found an 8-year-old girl and her father stranded on a logjam. "Their house had been swept away with them in it," says Flores. "The father had several broken bones and was totally incapacitated."

Although game wardens are trained in water-rescue techniques, these rescuers had to improvise a quick rescue. "They assembled a makeshift bridge out of debris and boards, and climbed across it to reach the girl and her father," says Flores. "They pulled them out and put them in the patrol boat."

In last November's flood, TPW game wardens again helped rescue people stranded after severe thunderstorms flooded Blanco and Guadalupe counties. Wardens pulled three people from Blanco County floodwaters, and one person was killed there. In San Antonio, one 18-year-old girl was killed and her friend rescued after they drove into 12-foot-high waters in Geronimo Creek in northern Guadalupe County.

Wardens use everything from jet skis to flat-bottomed riverboats to kayaks to 65-foot patrol boats to help Texans stay safe. During a water rescue, their duties can range from pulling citizens from trees to deterring looters, according to Flores, who has been involved in many water rescues.

"We take great pains to make sure our equipment is always ready to go and our training up to date," he says. "If not, we would be putting ourselves at great risk as well as the people we are trying to rescue."

Jim Stinebaugh, director of Law Enforcement at TPW, is proud of the wardens, who often provide the first line of defense for citizens in rural Texas when disaster strikes. "Saving lives in these situations is one of the most rewarding duties our wardens are called on to perform," he says.

While Flores says the wardens are glad to help, he reminds people to heed warnings, from watching weather forecasts to avoiding low-water crossings. "Most of the people we rescue did not."

— Kristen Everett

While flash floods are known to occur throughout the state, the Hill Country is known as "flash flood alley." According to Richard Earl, a geographer at Southwest Texas State University, the Hill Country is even more susceptible to flooding because of its thin soils with large areas of exposed bedrock and relatively sparse vegetation, which produce rapid runoff. The Balcones Escarpment is also a trigger for storm formation. William Asquith, a hydrologist with the USGS, believes that the steep slopes of the Hill Country produce some of the highest runoff rates in the United States — and possibly the world. The region is an elephant's graveyard for tropical cyclones, which crash into the Texas Gulf Coast and often stall over the Hill Country where they spend themselves, releasing raging torrents as they die.



The Aftermath

When the flood subsided, Regina Campbell returned to Cuero to visit her home and her business, a nearby beauty salon. At each place she found a similar sight: The force of the water had piled all the furniture and equipment inside against the main entryway, blocking the doors. The floors were covered with three inches of mud. In Regina's church, the water had lifted the communion table over a four-foot banister and set it down. On the table, the cross, candles and tablecloth were all undisturbed.

Campbell had no flood insurance, and in the weeks after the flood, she discovered that she didn't qualify for a federal loan to rebuild her business. That week she moved with her husband and their five children to Yoakum, into a small, three-bedroom house with five other people. Despite the abundant company, she was hit by an overwhelming feeling of isolation. "When the flood is coming, they tell you to leave, get out! The Lord will provide," she says. "But after the flood, it was like I was set on an island by myself, with no one around me, with all the troubles piled on my shoulders."

ALTHOUGH CANYON RESERVOIR CAPTURED almost 43 billion gallons of floodwater, nearly all of the runoff measured at Cuero and Victoria was the result of the peak rainfall, which occurred downstream of the reservoir. At Cuero, where the San Marcos River joins the main stem of

A pickup truck lies overturned and a storage shed sits on the roof of a house in the wake of the floodwaters. A youngster finds an unusual item in the debris near a bridge over the Comal River.



PUSHING A WALL OF DEBRIS
MADE UP OF TREES, CARS AND
ALL MANNER OF FLOTSAM,
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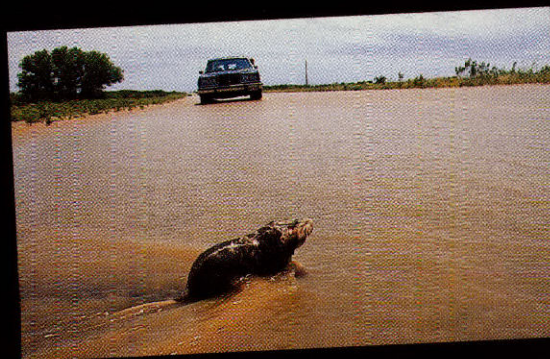


PHOTO © WYMAN MEINZER

HOW FLOODS HELP HABITAT

IN THE BIBLICAL STORY of Noah's Ark, Noah rescued two of each animal species from a great flood. But non-catastrophic floods, despite their dark side, can actually benefit wildlife and ecosystems.

Floods are a natural part of life in Texas. They spread silt and organic matter across floodplains and estuaries, replenishing the fertility of these ecosystems. Without flood-deposited sediment, coastal lands subside and shorelines erode, threatening coastal wetlands. Floods import and export nutrients and organic matter, an important source of energy for aquatic organisms. The force of floodwaters sculpts river channels, creating riffles, runs and pools that provide habitat for freshwater fish. As floodwaters invade riparian areas, fish will follow to seek refuge from the currents, to reproduce or to cash in on easy prey.

Wetlands depend on floods for their maintenance. On the floodplain, bottomland hardwoods, oxbow lakes, and seasonal wetlands are replenished with nutrients, organic matter, sediment and a new mix of aquatic organisms. Seasonal wetlands provide habitat for wintering waterfowl. Receding floods also set a banquet table for shorebirds and wading birds.

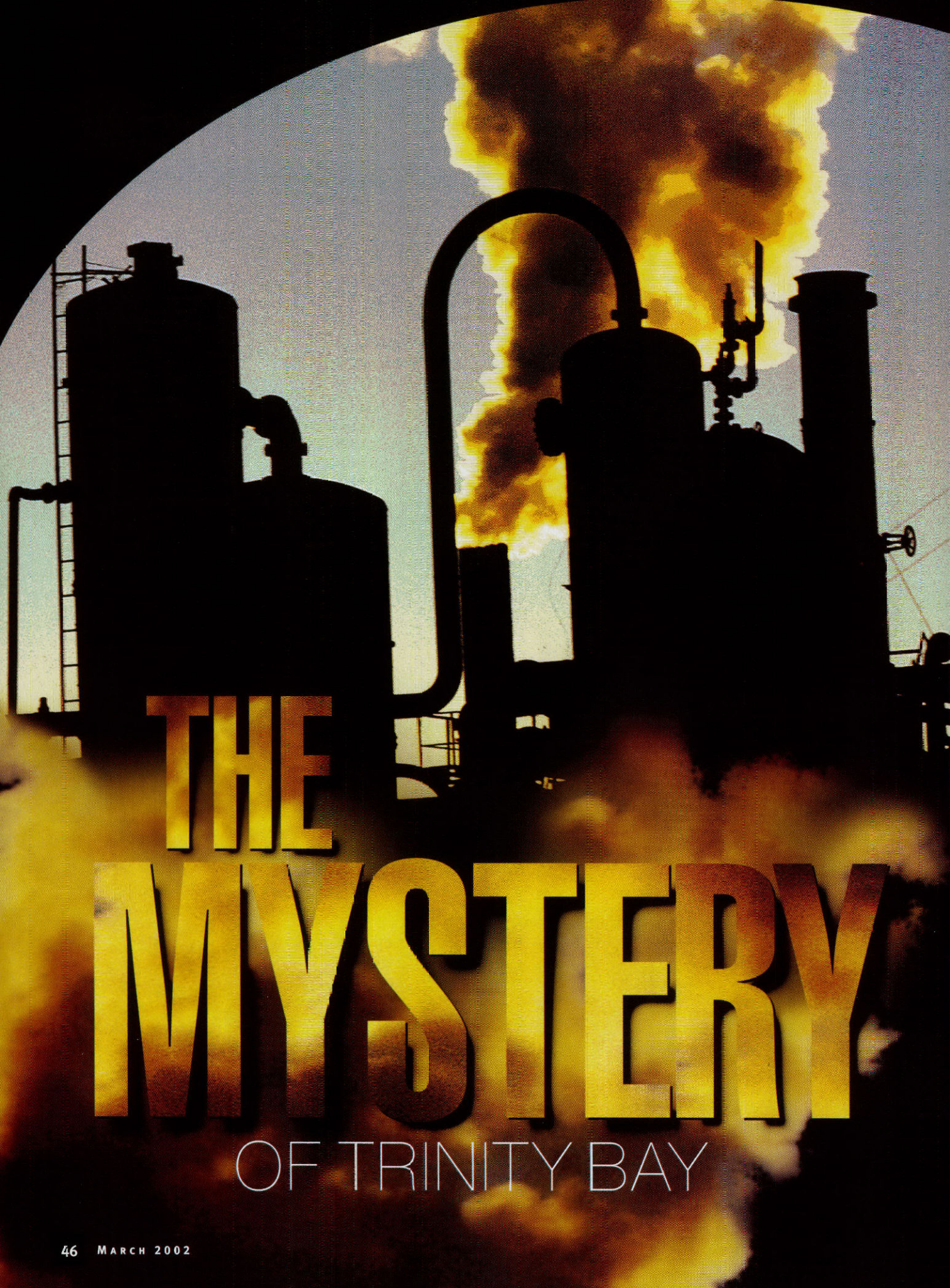
At the end of most of Texas' major rivers, the bays and estuaries receive flood-delivered goods. Freshwater helps maintain the right salinity conditions needed by crabs, shrimp and other crustaceans, as well as fish, oysters and seagrasses.

Floods that undercut the roots of tall trees and topple them into creeks create sunning and loafing sites for turtles, snakes, and wood ducks and establish natural bridges for raccoons, opossums, and foxes. Submerged brush piles stacked up against fallen trees provide a watery grotto for crappie and catfish. Floods that remain on the land long enough to kill standing timber can create rookery sites for herons, roosting sites for bats, and feeding and nesting sites for woodpeckers.

Heavy rains that fall on long-dry playa lake basins on the Texas High Plains provide one of the stranger flooding stories. The desiccated eggs of fairy shrimp that may have lain dormant in the wind-blown sediments of a playa bottom for many years suddenly hatch and rapidly grow into two inch-long primordial creatures with the head of a horseshoe crab and the tail of a shrimp. Fairy shrimp (named for their magical occurrence) mature, lay eggs for the next generation, provide food for herons and gulls, and disappear until the next flood.

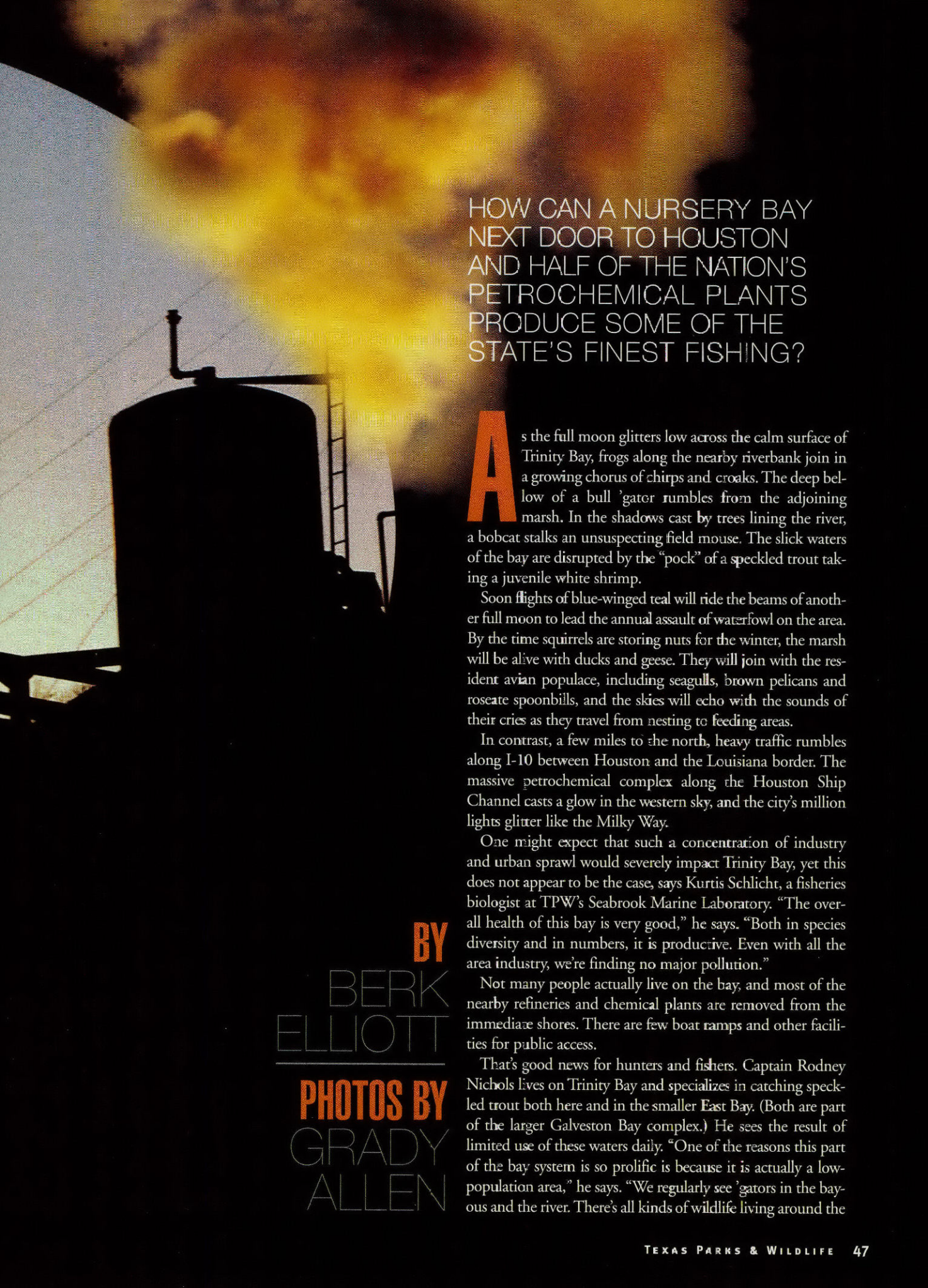
Although Noah may have saved the terrestrial animals from the biblical flood, modern floods rescue fairy shrimp (and many other species of wildlife) from Texas droughts.

— Ron George and Kevin Mayes



THE MYSTERY

OF TRINITY BAY



HOW CAN A NURSERY BAY NEXT DOOR TO HOUSTON AND HALF OF THE NATION'S PETROCHEMICAL PLANTS PRODUCE SOME OF THE STATE'S FINEST FISHING?

As the full moon glitters low across the calm surface of Trinity Bay, frogs along the nearby riverbank join in a growing chorus of chirps and croaks. The deep bellow of a bull 'gator rumbles from the adjoining marsh. In the shadows cast by trees lining the river, a bobcat stalks an unsuspecting field mouse. The slick waters of the bay are disrupted by the "pock" of a speckled trout taking a juvenile white shrimp.

Soon flights of blue-winged teal will ride the beams of another full moon to lead the annual assault of waterfowl on the area. By the time squirrels are storing nuts for the winter, the marsh will be alive with ducks and geese. They will join with the resident avian populace, including seagulls, brown pelicans and roseate spoonbills, and the skies will echo with the sounds of their cries as they travel from nesting to feeding areas.

In contrast, a few miles to the north, heavy traffic rumbles along I-10 between Houston and the Louisiana border. The massive petrochemical complex along the Houston Ship Channel casts a glow in the western sky, and the city's million lights glitter like the Milky Way.

One might expect that such a concentration of industry and urban sprawl would severely impact Trinity Bay, yet this does not appear to be the case, says Kurtis Schlicht, a fisheries biologist at TPW's Seabrook Marine Laboratory. "The overall health of this bay is very good," he says. "Both in species diversity and in numbers, it is productive. Even with all the area industry, we're finding no major pollution."

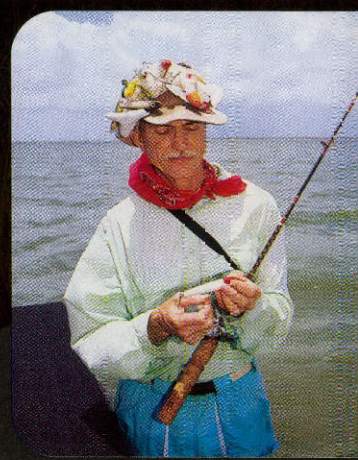
Not many people actually live on the bay, and most of the nearby refineries and chemical plants are removed from the immediate shores. There are few boat ramps and other facilities for public access.

That's good news for hunters and fishers. Captain Rodney Nichols lives on Trinity Bay and specializes in catching speckled trout both here and in the smaller East Bay. (Both are part of the larger Galveston Bay complex.) He sees the result of limited use of these waters daily. "One of the reasons this part of the bay system is so prolific is because it is actually a low-population area," he says. "We regularly see 'gators in the bay-ous and the river. There's all kinds of wildlife living around the

BY
BERK
ELLIOTT

PHOTOS BY
GRADY
ALLEN

MORE THAN 250,000 SPECKLED TROUT WERE STOCKED IN TRINITY BAY LAST YEAR. OBVIOUSLY, SUCH NUMBERS BODE WELL FOR THOSE WHO LIKE TO FISH THERE.



marsh, and the waters are full of fish. Fishing is good here because they've got everything they need, especially bait. I've seen clouds of shrimp coming out of the marsh and the bayous through Jack's Pass. With all the countless bayous cutting through the marsh, Trinity Bay is just a large nursery."

"Trinity is the most underutilized bay in the Galveston complex, although it has always been a hunter's bay," Schlicht points out. "Activity and fish catches have increased in recent years, though, in spite of limited access to the area."

Part of the reason fishing is improving is TPW's stocking program. There are currently 61 stocking sites in the Galveston Bay complex, and five of them are in Trinity Bay. More than 1.26 million red drum were released into Trinity Bay in 1998, with more than another quarter of a million released in 1999 and 2000. More than 250,000 speckled trout were stocked in Trinity Bay last year. Obviously, such numbers bode well for those who like to fish there.

Weather is also helping to improve the fishing. Following a couple of years of devastating drought, rains finally came last fall, and fresh water has frequently flushed out the system since then. That flow from the river is critical to maintaining

the balance of fresh to brackish to salty waters necessary for a healthy marsh and prolific nursery. (Many species of marine life require brackish water in their infancy.)

Schlicht points out that the bay is changing in other ways as well. "The Vingt-et-uns, a chain of small islands a short distance off Smith Point, are vanishing due to subsidence and erosion," he says. "Across the bay, you will notice that after years of removing oil and gas rigs, the rig counts are going back up. That started about three years ago. Up to the north, the seagrass beds have increased — especially widgeon grass. It's amazing how well it is doing up there."

These evolutionary changes will enhance fishing in the area. As the Vingt-et-uns settle beneath the waves, they will form reefs for fish to relate to. Each oil or gas rig is placed on a foundation pad of oyster shell that is a magnet for fish. And the expanding grass beds indicate healthy waters. The grass beds serve both as fish habitat and a natural water-purification system.

Nichols says that while many fishers know about the great fishing in Trinity Bay during the fall, most don't realize that the spring can be just as good. "There are lots of reefs and lots of reds in the upper end of the bay," he says. "There's always

fish up there if it is salty. Again, they have everything they need — shrimp, shad, mullet. I always look for mud boils up there during the spring.” (Mud boils are disturbed water made by feeding redfish.)

Schlicht agrees that spring is a great time to fish Trinity Bay. “In the spring, Smith Point, Little Hodges, Fisher’s Reef and the Vingt-et-uns are popular fishing spots,” he says. When it is windy, Nichols likes to wade. “We target areas near leeward shorelines or shallow reefs,” he says. “And, of course, there is the old river channel and the spoil banks. The fish may be anywhere you find oyster shell.”

During the summer, move to deeper water and key on reefs and artificial structure, Nichols advises. “There are quite a few new oil and gas wells, but over the years a number of the old rigs were removed,” he says. “Just because the rigs are no longer there doesn’t mean the area doesn’t still hold fish — the oyster shell pads are still there. I mark the shell pads using my GPS unit and often find specks still holding over that same structure, especially during the summer. The warmer months are also wide open for wading and throwing topwater baits. During July last year, we were catching fish all the way from Jack’s Pocket to Point Barrow. When the water is salty and there’s no wind, you can fish almost anywhere.”

While spring fishing can be excellent, Trinity Bay has long been known for what can be phenomenal fishing during the fall. Flounder begin their annual migration toward the passes, and anglers can target flatfish as well as specks and reds. Nichols recommends that winter anglers fish along the north shoreline from the mouth of the Trinity River on to the west.

“Working birds” are a phenomenon common to this bay. Predator fish trap schools of shrimp or other baitfish at the surface, cutting off their escape. The hapless victims are twice cursed, as seagulls gather to pick them off from above.

These “working birds” can lead savvy fishermen to the nearest thing to a sure bet they will ever find. Several years ago, working birds helped me find a large school of specks along the east shoreline of the bay. For nearly two hours, it was mayhem. That once-in-a-lifetime session resulted in our catching and releasing more than 50 trout on topwater baits.

“Birds can work almost anytime,” Nichols explains. “While the activity peaks during the fall, birds work up here almost every month of the year. In most places, when you find fish feeding under the birds, they tend to be small, many times under the legal size limit. For some reason, it isn’t uncommon to find bigger fish under the birds in Trinity.”

Of course, the next time you race to get in on some hot action, you may find a school of gafftopsail catfish feeding under the birds. That’s typical, Nichols concludes. “Just as soon as you think you have the fish patterned,” he says, “they will prove you wrong.”

One pattern has not changed on Trinity Bay. Long before the skyscrapers, the people, the cars and the refineries arrived, this great bay was a home to Native Americans and abundant wildlife and fish. Then as now, it was home to speckled trout and redfish, bobcats and foxes, alligators and sharks. In spite of encroaching civilization, it somehow remains so even today. ★

GETTING THERE

TO REACH TRINITY BAY, take I-10 east out of Houston. While amenities are sparse in the immediate area, you can find accommodations in nearby Baytown or Houston. For information, contact the Houston Convention and Visitors Bureau at <www.houston-guide.com> or (800) 446-8786.

There are a limited number of boat ramps on this bay. Among the more popular locations, beginning at the northwest corner and moving clockwise, are the following free ramps:

- **Roseland Park:** Go to Baytown and take Texas Avenue east off FM 146 to the park (on Cedar Bayou).

- **Gou Hole:** Take I-10 east out of Houston. Exit at FM 146 and continue east on feeder road to FM 3246 (Gou Hole Road). Turn right and bear right at the fork onto Maley. Follow to ramp.

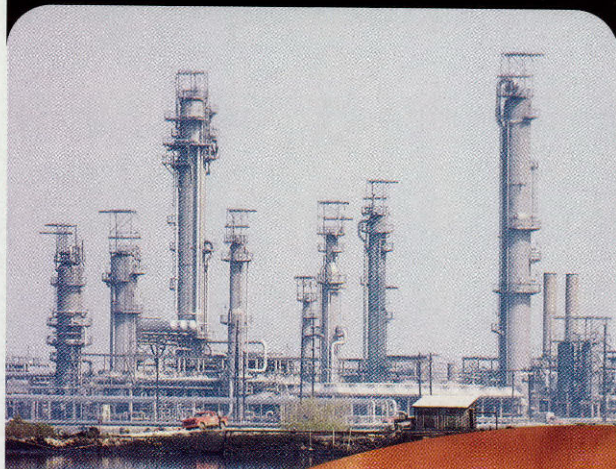
- **Fort Anahuac Park:** Take Anahuac exit (FM 563) off I-10 east. Follow through Anahuac and watch for signs into the park. (This location also offers drive-in wadefishing off the long peninsula beyond the boat ramps.)

- **Double Bayou (at Oak Island):** Take the Anahuac exit off I-10 and continue south on FM 563 to Oak Island.

- **Smith Point:** Off I-10 east, take the Hankhamer exit. Turn right on FM 61 to the intersection of FM 65 and FM 562. Follow FM 562 south until it dead-ends at Smith Point. (To the right will be Trinity Bay and to the left, around the point, will be East Bay.)

Those who like to wadefish should beware. Much of this area abounds with both alligators and bull sharks during warm-weather months.

For general information on fishing Trinity Bay, contact the Saltwater Anglers League of Texas at <www.saltclub.org>.



TPW Photo



BEAVERS ARE BACK

These hardworking mammals once helped create a lush landscape across the American West before they were nearly wiped out. Now the beaver is making a comeback.

By Larry D. Hodge



THE DALLAS–FORT Worth Metroplex is just about the last place in Texas one would expect to find beavers. But since the 1960s, there have been hundreds of complaints from homeowners about felled trees, tunneling of tank dams and damage to boat docks and other wooden structures. Although most people don't realize it, beavers, once nearly extinct in Texas, have reclaimed much of their former range. I saw my first Texas beaver swimming in the Rio Grande near Lajitas, and a friend who lives near Bay City found a 50-pounder run over on the road.

Beavers are native to North America; estimates of their number at the time Europeans arrived range from 200 million to 400 million. Today they happily build ponds and lodges from northern Mexico all the way to Alaska and number perhaps 10 million. Anyone who lives near a pond, lake, creek or river is likely to have beavers for neighbors and not even know it — until their favorite fruit tree is gnawed in the night or a culvert is mysteriously plugged and backs water over a road.

Castor canadensis is consumed by the urge to build dams and chew trees. The beaver's dam-building instinct is triggered by the sound of flowing water. People once attributed their engineering skill to intelligence, but this was disproved when a researcher played a tape recording of running water in the middle of a flat field — and beavers covered the player with branches and mud. In fact, the beaver has a tiny brain for its size. The ratio of brain size to body weight is the lowest of any mammal.

But beavers are not dimwits. Much of

ple and loved being petted. He also said they were remarkably fond of rice and plum pudding.

The importance of beavers in building the pre-Columbian environment of North America can hardly be overestimated. Beavers are the only North American mammals besides humans that can fell mature trees. They have few natural enemies and were one of the most successful animals on the continent until Europeans arrived and created a market for their fur. Building as many as 300 dams per square mile, beavers created vast wetlands that nurtured a variety of other animals. Much of the "arid West" later reclaimed at huge expense was well-watered meadows and valleys until beavers disappeared.

A European (and later American) passion for beaver hats came near rubbing beavers out entirely. In 1638 England's Charles I ruled that only beaver fur could be used to make hats. Beaver pelts became so valuable that for a time they were used as a frontier standard of currency — two prime beaver pelts were worth a prime black bear pelt in Canada in 1838. Shipped to Europe, the pelts underwent processing that enhanced their ability to shed water. But the beaver had the last laugh. Pelts were treated with nitrate of mercury to improve the fur's matting ability. When heat and water were applied, poisonous mercury vapors were released. Mercury poisoning causes nerve damage leading to muscle twitches and difficulty in walking, talking and thinking. "Mad as a hatter" became part of the English idiom.

Today beavers are making a comeback — even in Texas, where few remained by 1900. Extirpated in East Texas, some survived in the creeks and

only natural form of wetlands increasing in North America.

Beavers' teeth never stop growing, and to keep them trimmed they have to chew trees. That's what often gets them in trouble with property owners today. No one likes to see a favorite tree felled or girdled. Yet most trees gnawed by beavers are within 15 feet of water, so it is possible to have beavers and trees, too.

Dam-building where people don't want dams also gets beavers in trouble. To a beaver, a culvert looks like a hole in an otherwise perfectly good dam, and instinct tells them to plug it and save the precious water. A flooded road or driveway is the usual result.

But beaver dams in the right places have many benefits. Ponds provide habitat for waterfowl, deer, raccoons and songbirds. The ponds also slow runoff from rains, keeping streamflow more constant, decreasing flooding, conserving soil and helping maintain the water table. And there's something comforting about seeing the watery "V" made by a beaver swimming across its pond, or hearing the slap of a startled beaver's tail on the water.

Human-beaver conflicts sometimes result in removal of the beavers by lethal or nonlethal means. (Except for nuisance beavers on your own property, a trapper's or hunting license is required to take beavers, but only persons with a trapping license may sell the pelts. See complete regulations in the TPW publication *Fur-Bearing Animal Digest*.) However, it's a good bet that if beavers found a location attractive once, they'll like it again.

You can get some hints on how to protect roads and trees without harming beavers at www.beaversww.org/solutions.html. To read more about these fascinating creatures and the role

Building as many as 300 dams per square mile, beavers created vast wetlands that nurtured a variety of other animals. Much of the "arid West" later reclaimed at huge expense was well-watered meadows and valleys until beavers disappeared.

their behavior is learned. One of the first Europeans to describe beavers was Samuel Hearne, an employee of the Hudson's Bay Company in the mid-1700s. Hearne kept some in his house as pets and asserted they answered to their names, recognized individual peo-

ple and loved being petted. He also said they were remarkably fond of rice and plum pudding. The importance of beavers in building the pre-Columbian environment of North America can hardly be overestimated. Beavers are the only North American mammals besides humans that can fell mature trees. They have few natural enemies and were one of the most successful animals on the continent until Europeans arrived and created a market for their fur. Building as many as 300 dams per square mile, beavers created vast wetlands that nurtured a variety of other animals. Much of the "arid West" later reclaimed at huge expense was well-watered meadows and valleys until beavers disappeared.

they played in our country's history, see *Water: A Natural History*, by Alice Outwater. ☆

LARRY D. HODGE is executive editor of *Texas Parks and Wildlife Press* and wildlife editor of this magazine.

Continued from page 44

the Guadalupe, runoff was calculated at nearly 600 billion gallons. About 43 percent of the homes in Cuero were flooded, even those two miles from the Guadalupe like Campbell's. The flood was three miles wide by the time it reached Victoria, where the peak streamflow was nearly three times the previous record in 1833. The rain falling in the upper watershed of the Guadalupe and the San Antonio Rivers created floods that converged where the rivers merged below Victoria. After the floods merged they eventually drained into the Guadalupe Estuary and San Antonio Bay, providing a massive freshwater pulse to the brackish marine environment.

★

By the time the 1998 flood was finally over, records had been established at Cuero and Victoria. Thirty-one people had died; many of those drowned while attempting to drive through low-water crossings. More than 10,000 people were displaced. Property damage totaled some \$750 million. As severe as this flood was, many lives were saved — and property was protected — because the flood began during daylight hours and people heeded the warnings.

The 1998 flood was probably the third-largest flood on the upper Guadalupe since records have been kept — only the 1913 and 1869 floods were larger. But it was not by any means the worst flood Texas has seen. While the flood established some records, says Earl, “the October 1998 flood in south-central Texas was probably not the 500-year flood.” According to Asquith, “Many storms with similar or greater amounts of rainfall have occurred over much of central and south Texas during the past 100 years.”

Indeed, the Guadalupe itself has experienced frequent major floods. “There have been 20 major floods on the Guadalupe since 1900,” says Tommy Hill, chief engineer for the Guadalupe-Blanco River Authority. On average, a major flood occurs every five years. Annual flood losses in Texas average \$32 million.

When the Next Flood Comes

Is Texas prepared for the next major flood? In 1999 the Texas Legislature appointed a blue-ribbon committee to study that question. Some of the problems the committee identified are easy to understand. “Texas has the fewest numbers of state employees devoted to disaster preparedness of any of the most populous states,” explains Tom Millwee, state coordinator for the Division of Emergency Management. “An average large state has about 160 employees dedicated to state emergency management. California currently has more than 600. Texas has 62. Yet Texas is number one in tornado and flooding events, and second in tropical events.”

Some problems are more difficult to address. Earl believes floodplain maps tend to underestimate flood potentials. “First, the models that predict them use too low of precipitation amounts for the 100- and 500-year flood,” he says. “Second, flood maps are political documents that are subject to modification under political pressure.” The accuracy of floodplain maps concerns Asquith as well. “Potential error in estimation of the 100-year flood flow can approach 40 percent or even higher.”



DISPUTED TERRITORY

FLOODPLAINS ARE THE LAND next to rivers, creeks, streams and lakes that experience flooding. These floodplains are dynamic features of the landscape where sandbars, oxbows and cutbanks come and go. They convey excess flow that cannot be handled by the normal channel. The animal and plant communities found there are adapted to the perpetual changes.

People are also attracted to floodplains when they seek a home or business with a beautiful waterside view. Some 8 million structures in Texas are located in floodplains. However, only 5 million of these are covered by insurance, such as the

National Flood Insurance Program administered by the Federal Emergency Management Agency. Texas is among the top four states that have the highest number of repeated losses to the same properties and structures.

What does it mean when they say a structure is in the 100-year floodplain? The 100-year floodplain is the area that statistically has a one percent chance of being flooded during any given year. It does not mean that an area will experience a flood once every 100 years. There are many examples of 100-year floods occurring in consecutive, or even in the same, years. “There is a one percent chance in any and every year that a flood will equal or be in excess of the 100-year level,” says Asquith. In part because of the confusion caused by the term 100-year flood, the Federal Emergency Management Agency is now using the term “base flood” instead.

Wetlands have traditionally provided the first line of defense against flooding. Because it is typically the peak flows that cause flood damage, wetlands reduce the force of flooding by collecting the water and slowly releasing it to larger streams and rivers. Now that more than half of Texas’ wetlands have been eliminated, a much larger volume of water pours into the state’s rivers within a shorter period of time. Like traffic on I-35 as it hits Austin or Dallas at rush hour, the water stacks up — and then it backs up. Drainage ditches and mechanically straightened stream channels speed the movement of water out of low areas, adding to the magnitude of floods.



Photos swept away by floodwaters are deposited downstream, miles away from their owners.

Other problems are self-inflicted. USGS must have a funding partner for each of their stream-flow gauges. Because of declining federal and state budgets, the number of gauges in Texas has diminished from a maximum of 650 in the 1960s to about 330 today. In addition, the National Weather Service's weather radio transmits watches and warnings to only 196 of Texas' 254 counties; 124 of these 196 counties are only partially covered.

How can Texas avoid the worst impacts of flooding? Traditionally, the solution has been to build a dam, to modify the waterway – or, most often, to build a levee. Levees have saved countless lives and protected property from raging waters; however, by relying heavily on levees, we have encouraged the unwise development of our nation's floodplains. The more we try to confine water between levees, the more it wants to escape. Levees often make the flooding more severe downstream where the levees end. Levees also have had severe impacts on aquatic ecosystems. For

these reasons, flood researchers now believe that levees are not monuments but tools — tools that are no longer the answer to every flood-related problem.

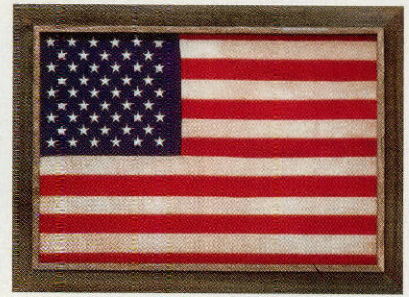
Other tools to reduce flood risks include wetland restoration and flood-warning systems. However, even with these alternatives, some portions of the landscape flood with such frequency that the placement of permanent structures there makes little sense. And so the question becomes: Is it right for the public to finance risky decisions and poor judgment by providing money to continually rebuild in the most high-risk areas?

Zoning to limit building in floodplains and buyouts of property in high-risk areas address this question.

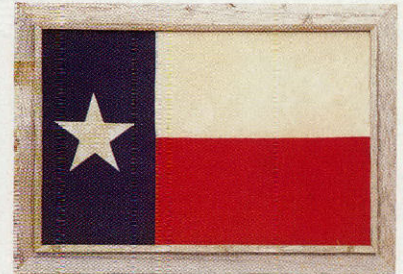
While there is much we can do to avoid the most serious consequences, floods will always be a part of life in Texas. With little or no warning, the rising waters will reclaim the former wetlands and low areas, and for a brief time take the uplands and hold them until the bulk of the flood passes. Afterward, the torrent will ease, and the water will return, often reluctantly, to its confinement within the river channel, waiting for its next opportunity to escape and go on the rampage again. ★

FOR MORE INFORMATION

FOR INFORMATION on preparing for the next flood on the Guadalupe, the Guadalupe-Blanco River Authority has prepared *Staying Safe: A Guide for Flooding in the Guadalupe River Basin*. Call (800) 413-4430. The USGS has just released the new multimedia CD, *Major Floods and Storms in Texas*. Covering the last 100 years of Texas floods, it includes photos and information on the location and description of storms, rainfall and streamflow data, and data on flood losses. It is available from the USGS at (512) 927-3500.



United States (28"H x 40"W)



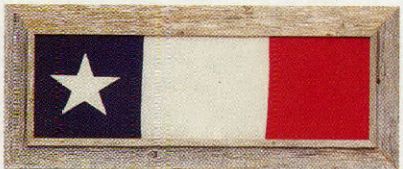
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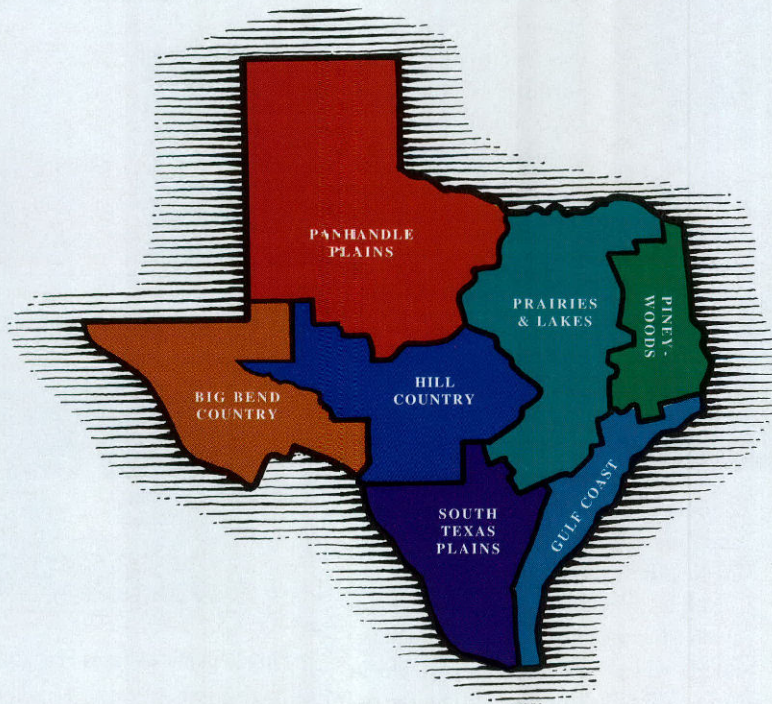
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BIG BEND COUNTRY

March: Bouldering Tours, every Saturday and Sunday also available Wednesday through Friday by advance request, Hueco Tanks SHP, El Paso, (915) 849-6684.

March: Pictograph Tours, every Saturday and Sunday also available Wednesday through Friday by advance request, Hueco Tanks SHP, El Paso, (915) 849-6684.

March: White Shaman Tour, every Saturday, Seminole Canyon SHP, Comstock, (888) 525-9907.

March: Fate Bell Cave Dwelling Tour, every Wednesday through Sunday, Seminole Canyon SHP, Comstock, (915) 292-4464.

March: Nature Hikes, call for dates, Davis Mountains SP, Fort Davis, (915) 426-3337.

March: Maravillas Canyon-Rio Grande Equestrian Trail Ride, call for dates during business hours, Black Gap WMA, Alpine, (915) 376-2215

March: Desert Garden Tours, by reservation only, Barton Warnock Environmental Education Center, Terlingua, (915) 424-3327.

March: Renton Cave Springs and San Solomon Cienega Hike, every Saturday, Balmorhea SP, Toyahvale, (915) 375-2370.

March: 3rd Walks, call for dates, Davis Mountains SP, Fort Davis, (915) 426-3337.

March 1-31: Fishing on the Rio Grande, Elck Gap WMA, Alpine, (915) 376-2216.

March 2-3, 16-17: Trail Walks, Franklin Mountains SP, El Paso, (915) 556-6441.

March 2, 23: Presa Canyon Tour, Seminole Canyon SHP, Comstock, (915) 292-4464.

March 3, 10, 24: Big Bend Lecture Series, Barton Warnock Environmental Education Center, Terlingua (915) 424-3327.

March 9: Stories of Spirits, Magoffin Home SHS, El Paso,

(915) 533-5147.

March 9: Upper Canyon Tour, Seminole Canyon SHP, Comstock, (915) 292-4464.

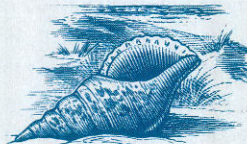
March 9-10, 11-12, 14-15: On the Trail of Echols Camel Treks, Big Bend Ranch SP, Presidio, (254) 675-4867.

March 14: Native Plant Identification, Fort Leaton SHS, Presidio, (915) 229-3613.

March 15-17: Desert Survival, Big Bend Ranch SP, Presidio, (877) 371-2634.

March 16: V V 75 Tour, Seminole Canyon SHP, Comstock, (915) 292-4464.

March 17: Bird Identification Tours, Hueco Tanks SHP, El Paso, (915) 849-6684.



GULF COAST

March: Weekend Programs, every Saturday and Sunday,

Brazos Bend SP, Needville, (979) 553-5101.

March: Sea Center Tours, every Tuesday through Saturday, Sea Center Texas, Lake Jackson, (979) 292-0100.

March: Plantation House, Barn and Grounds Tours, Varner Hogg Plantation SHS, West Columbia, (409) 345-4656.

March 1: Intracoastal Whooping Crane Tour, Matagorda Island SP & WMA, Port O'Connor, (361) 983-2215.

March 2: Whooping Crane Bus Tour, Matagorda Island SP & WMA, Port O'Connor, (361) 983-2215.

March 3, 15, 16: Beachcombing and Shelling Tour, Matagorda Island SP & WMA, Port O'Connor, (361) 983-2215.

March 9: 6th Anniversary Celebration, Sea Center Texas, Lake Jackson, (979) 292-0100.

March 9, 30: Wild Boar Safari, Fennessey Ranch, Bayside, (361) 529-6600.

March 10: 18th Annual Fords of the 50s Old Car Picnic, San Jacinto Battleground SHS, LaPorte, (281) 479-2431.

March 16, 23: Spring Migration and Wildflower Tour, Fennessey Ranch, Bayside, (361) 529-6600.

March 17: History Tours, Matagorda Island SP & WMA, Port O'Connor, (361) 983-2215.

March 23: 9th Annual Rivers, Lakes, Bays n' Bayous Trash Bash, San Jacinto Battleground SHS, LaPorte, (281) 479-2431.



HILL COUNTRY

March: Birdwatching, daily except when park closed for hunting, Pedernales Falls SP, Johnson City, (830) 868-7304.

Continued on page 57

SIGHTS AND SOUNDS



The Front Line of News and Views



TELEVISION

Look for These Stories in the Coming Weeks:

Feb. 22 – March 3:

Tarpon; Armand Bayou Nature Center; arresting poachers; the Marfa Lights; Martha Daniels cooks crawfish étouffée.

March 3 – 10:

Texas gets good marks from the national media; seahorses at the Texas State Aquarium; water safety; Martha Daniels cooks morel fettuccini; snow geese on the prairie.

March 10 – 17:

Youth hunting; Olympic medallist Kim Rhode; life and culture along the San Marcos River; Atwater's prairie chicken; Martha Daniels cooks fish chowder.

March 17 – 24:

A tour of the Fort Worth Zoo's new \$40 million native Texas wildlife exhibit.

March 24 – 31:

Bat Conservation International; a hummingbird ranch; the Civilian Conservation Corps; bighorn sheep; Martha Daniels cooks wild purple muffins.

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Visit a hummingbird ranch. Watch the week of March 24.

Amarillo: KACV, Ch. 2 / Sat. 3:30 p.m.

Austin: KLRU, Ch. 18 / Sun. 10 a.m. / Mon. 12:30 p.m. KLRU-TOO, Cable Ch. 20 / Tues. 11 p.m.

Bryan-College Station: KAMU, Ch. 15 / Thurs. 7 p.m. / Sun. 5 p.m.

Corpus Christi: KEDT, Ch. 16 / Sun. 11 a.m. / Thurs. 11:30 p.m.

El Paso: KCOS, Ch. 13 / Sat. 5 p.m.)

Dallas-Fort Worth: KERA, Ch. 13 / Fri. 1:30 p.m. Also serving Abilene, Denton, Longview, Marshall, San Angelo, Texarkana, Tyler, Wichita Falls, Sherman

Hartlingen: KMBH, Ch. 60 / Thurs. 8:30 p.m. Also serving McAllen, Mission, Brownsville

Houston: KUHT, Ch. 8 / Sun. 5 p.m. / Fri. 1 p.m. Also serving Beaumont/Port Arthur, Galveston, Texas City, Victoria

Killeen: KNCT, Ch. 46 / Sun. 5 p.m. Also serving Temple

Lubbock: KTXT, Ch. 5 / Sat. 6:30 p.m.

Odessa-Midland: KOCV, Ch. 36 / Sat. 5 p.m.

Portales, N.M.: KENW, Ch. 3 / Sun. 2 p.m. Also serving West Texas/Panhandle area

San Antonio & Laredo: KLRN, Ch. 9 / Thur. noon

Waco: KWBU, Ch. 34 / Sat. 3 p.m.

Check local listings. Times and dates are subject to change, especially during PBS membership drives.

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Alpine: KSRC-FM 92.7 / Thurs. – Sat. 9 p.m.

Amarillo: KACV-FM 89.9 / 11:20 a.m.

Atlanta: KAQC cable channel 22 / 8:15 a.m.

Austin: KUT-FM 90.5 / 1:58 p.m., (12:58 p.m. Fr.), KVET-AM 1300 / 6:15 a.m. (Sat.) • *Austin American-Statesman's* Inside Line 512-416-5700 category 6287 (NATR)

Beaumont: KLVI-AM 560 / 5:20 a.m.

Big Spring: KBST-AM 1490 / 8:25 a.m., cable ch. 23 / 8:25 a.m., KBST-FM 95.7 / 8:25 a.m.

Brady: KNEL-AM 1490 / 7:20 a.m. / Sat. 7:50 a.m., KNEL-FM 95.3 / 7:20 a.m. / Sat. 7:50 a.m.

Bridgeport: KBQC-FM 98.3 / 1:15 p.m.

Bryan: KZNE-AM 1150 / 5:45 p.m.

Canton: KVCI-AM 1510 / 6:40 a.m.

Canyon: KWTS-FM 91.1 / 6 a.m. – 9 a.m. hours

Carthage: KGAS-AM 1590 / 6:46 a.m., KGAS-FM 104.3 / 6:46 a.m.

Center: KDET-AM 930 / TBA

Coleman: KSTA-AM 1000 / 5:15 p.m.



SIGHTS & SOUNDS

Columbus: KULM-FM 98.3 / 7:20 a.m.,
KNRG-FM 92.3 / 7:20 a.m.

Comanche: KCOM-AM 1550 / 6:30 a.m.

Commerce: KETR-FM 88.9 / 10:15 a.m.

Corpus Christi: KEDT-FM 90.3 / 5:34
p.m., KFTX-FM 97.5 / 5:35 a.m.

Crockett: KIVY-AM 1290 / 8:15 a.m.,
KIVY-FM 92.7 / 8:15 a.m.

Cuero: KVCQ-FM 97.7 / 6:50 a.m.

Del Rio: KWMC-AM 1490 / 5:50 p.m.

Denison/Sherman: KJIM-AM 1500 /
9:04 a.m.

Dimmitt: KDHN-AM 1470 / 12:31 p.m.

Dumas: KDDD-FM 95.3 / 10:30 a.m.
KDDD-AM 800 / 10:30 a.m.

Eagle Pass: KINL-FM 92.7 / 7:15 a.m.

Eastland: KEAS-AM 1590 / 5:51 a.m. &
5:51 p.m., KATX-FM 97.7 / 5:51 a.m. &
5:51 p.m.

Edna: KGUL-FM 96.1 / 6:50 a.m.

El Campo: KULP-AM 1390 / 2:00 p.m.

El Paso: KXCR-FM 89.5 / 12:20 p.m.

Fairfield: KNES-FM 99.1 / 6:49 a.m.

Floresville: KWCB-FM 89.7 / 1:30 p.m.

Fort Stockton: KFST-AM 860 / 12:50
p.m., KFTS-FM 94.3 / 12:50 p.m.

Fort Worth: KTCU-FM 88.7 / 8:50 a.m. &
5:50 p.m.

Galveston: KGBC-AM 1540 / 11:45 a.m.

Greenville: KGVL-AM 1400 / 8:15 a.m.

Hallettsville: KHLT-AM 1520 / 6:50 a.m.,
KTXM-FM 99.9 / 6:50 a.m.

Harlingen: KMBH-FM 88.9 / 4:58 p.m.

Hereford: KPAN-AM 860 / 2:50 p.m.,
KPAN-FM 106.3 / 2:50 p.m.

Hillsboro: KHBR-AM 1560 / 9:30 a.m.

Houston: KBME-AM 790 / 11:30 a.m.

Huntsville: KSHU-FM 90.5 / 11:55 a.m.,
5:55 p.m.

Jacksonville: KEBE-AM 1400 /
7:25 a.m.

Junction: KMBL-AM 1450 / 6:46 a.m. &
3:46 p.m., KOOK-FM 93.5 /
6:46 a.m. & 3:46 p.m.

Kerrville: KRNH-FM 92.3 / 5:31 a.m. &
12:57, 7:35 p.m.

Lampasas: KCYL-AM 1450 / 7:10 a.m.,
KACQ-FM 101.9 / 7:10 a.m.

Levelland: KLVT-AM 1230 / 12:05 p.m.

Lubbock: KJTV-AM 950 / 6:50 a.m.

Marble Falls: KHLB-AM 1340 / 7:20 a.m.

Marshall: KCUL-AM 1410 / 6:39 a.m.,
KCUL-FM 92.3 / 6:39 a.m.

McAllen: KHID-FM 88.1 / 4:58 p.m.

Mesquite: KEOM-FM 88.5 / 5:30 a.m. &
2:30, 8:30 p.m. M-Th. (5:30 a.m. & 4:45
p.m. Fr.)

Midland/Odessa: KCRS-AM 550 / 6:15
a.m. & 5:50 p.m.

Mineola: KMOO-FM 99.9 / 5:15 p.m.

Nacogdoches: KSAU-FM 90.1 / 3:00 p.m.

New Braunfels: KGNB-AM 1420 /
6:52 a.m.

Ozona: KYXX-FM 94.3 / 6:22 p.m.

Pecos: KIUN-AM 1400 / 10:30 a.m.

Rockdale: KRXT-FM 98.5 / 5:04 a.m. &
6:35 p.m.

San Angelo: KUTX-FM 90.1 /
1:58 p.m. (12:58 p.m. Fr.)

San Antonio: KENS-AM 1160 / 7:40
a.m., 12:30 & 5:45 p.m., KSTX-FM 89.1 /
9:04 p.m. Th.

San Augustine: KCOT-FM 92.5 / TBA

Seguin: KWED-AM 1580 / 7:55 a.m.

Sonora: KHOS-FM 92.1 / 6:22 p.m.

Sulphur Springs: KSST-AM 1230 /
4:45 p.m.

Texarkana: KTXK-FM 91.5 / noon hour

Uvalde: KVOU-AM 1400 / 5:33 a.m.
KVOU-FM 105 / 5:33 a.m.

Victoria: KVRT-FM 90.7 / 5:34 p.m.,
KTXN-FM 98.7 / 6:50 a.m., KZAM-FM
104.7 / 6:50 a.m.

Waco: KBCT-FM 94.5 / 6:05 a.m.

Wichita Falls: KWFS-AM 1290 / 6:15 a.m.

Yoakum: KYKM-FM 92.5 / 6:50 a.m.

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Continued from page 54

March: Walking Wild Cave Tour, every Saturday and Sunday, weather permitting, Colorado Bend SP, Bend, (915) 628-3240.

March: Gorman Falls Tour, every Saturday and Sunday, Colorado Bend SP, Bend, (915) 628-3240.

March: Nature Hike, every Sunday, Kerrville-Schreiner SP, Kerrville, (830) 257-5392.

March 2: Crawling Wild Cave Tour, Colorado Bend SP, Bend, (915) 628-3240.

March 2-3: Quilt Show, Lyndon B. Johnson SHS, Stonewall, (830) 644-2252.

March 8-10: Becoming an Outdoors-Woman Workshop, Camp Buckner, (512) 389-8198

March 15-17: Photography Seminar, X Bar Ranch, Eldorado, (915) 949-7970.

March 16: Star Party, Fort McKavett SHS, Fort McKavett, (915) 396-2358.

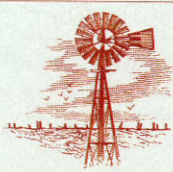
March 16: Enchanted Rock Trail Project Day, Enchanted Rock SNA, Fredericksburg, (512) 445-3862.

March 18: Austin Fly Fishers meeting, Austin, (512) 918-1832.

March 23: West Texas Heritage Days, Fort McKavett SHS, Fort McKavett, (915) 396-2358.

March 23: Golden-cheeked Warbler Celebration, Austin, (512) 476-9805.

March 30: Deer-resistant Native Plants, Mayfield Park, Austin, (512) 453-7074.



PANHANDLE-PLAINS

March: Nature Walk with Llamas, by reservation only through Jordan Llamas, San Angelo SP, San Angelo, (915) 651-7346.

March 9: History Hike, Palo Duro Canyon SP, Canyon, (806) 488-2227.

March 9, 16, 29, 30: Evening Program, Caprock Canyons SP & Trailway, Quitaque, (806) 455-1492.

March 9, 16, 30: Nature Hike, Caprock Canyons SP & Trailway, Quitaque, (806) 455-1492.

March 15: Kids Day, Caprock

Canyons SP & Trailway, Quitaque, (806) 455-1492.

March 16: Stargazing, Palo Duro Canyon SP, Canyon, (806) 488-2227.

March 16: Campfire Tales, Abilene SP, Tuscola, (915) 572-3204.

March 23, 30: Palo Duro Pioneers, Palo Duro Canyon SP, Canyon, (806) 488-2227.

March 31: Easter Sunrise Service, Copper Breaks SP, Quanah, (940) 839-4331.

March 31: Easter Sunrise Service, Caprock Canyons SP & Trailway, Quitaque, (806) 455-1492.

March 31: Wildflower Safari, Palo Duro Canyon SP, Canyon, (806) 488-2227.



PINEYWOODS

March 1, 15: Nature Slide Program, Village Creek SP, Lumberton, (409) 755-7322.

March 2: St. Paddy's Adventure Challenge, Huntsville SP, Huntsville, (940) 256-0769.

March 3, 10, 17, 24: Walk on the Wild Side, Martin Dies, Jr. SP, Jasper, (409) 384-5231.

March 9: Mountain Lions of Texas, Martin Dies, Jr. SP, Jasper, (409) 384-5231.

March 9: Tree Expert Tour, Martin Dies, Jr. SP, Jasper, (409) 384-5231.

March 9: Opening Day of the Spring Season, Texas State Railroad SHS, Rusk, (800) 442-8951 or (903) 683-2561 outside Texas.

March 9, 23: Guided Nature Trail Hike, Village Creek SP, Lumberton, (409) 755-7322.

March 16: What's Buggin' You? Martin Dies, Jr. SP, Jasper, (409) 384-5231.

March 16: Alligator Etiquette, Martin Dies, Jr. SP, Jasper, (409) 384-5231.

March 22-24, 29-31: Dogwood Steam Train Excursions, Texas State Railroad SHS, Rusk, (800) 442-8951 or (903) 683-2561 outside Texas.

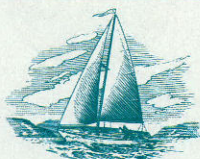
March 23: How Many Bears? Martin Dies, Jr. SP, Jasper, (409)

384-5231.

March 23: Wading Birds, Martin Dies, Jr. SP, Jasper, (409) 384-5231.

March 30: Floating the Forks, Martin Dies, Jr. SP, Jasper, (409) 384-5231.

March 30: Campfire Program, Martin Dies, Jr. SP, Jasper, (409) 384-5231.



PRAIRIES AND LAKES

March: Evenings at the Amphitheater, every Saturday, Stephen F. Austin SHP, San Felipe, (979) 885-3613.

March: Kreische Brewery Tours, every Saturday and Sunday, Monument Hill & Kreische Brewery SHS, La Grange, (979) 968-5658.

March: Historic and Scenic Tour, by reservation only to groups of ten or more, Monument Hill & Kreische Brewery SHS, La Grange, (979) 968-5658.

March: Interpretive Programs, every Saturday, Purtil Creek SP, Eustace, (903) 425-2332.

March 1-15: Wetlands, Texas Freshwater Fisheries Center, Athens, (903) 676-BASS.

March 1-31: Annual Trout Harvest, Texas Freshwater Fisheries Center, Athens, (903) 676-BASS.

March 2: Toast to Texas, Sebastopol SHS, Seguin, (830) 379-4833.

March 2-3: Texas Independence Day Celebration, Washington-on-the-Brazos SHS, Washington, (936) 878-2461 x245.

March 2-3, 10, 16-17, 23-24, 30: Guided Tours, Fanthorp Inn SHS, Anderson, (936) 873-2633.

March 3, 10: Kreische House Tours, Monument Hill & Kreische Brewery SHS, La Grange, (979) 968-5658.

March 9: Stagecoach Days, Fanthorp Inn SHS, Anderson, (936) 873-2633.

March 16: Birdhouse Basics, Cooper Lake SP/South Sulphur Unit, Sulphur Springs, (903) 945-5256.

March 16: Birdhouse Basics, Cooper Lake SP/Doctors Creek Unit, Cooper, (903) 395-3100.

March 16-17: 8th Annual Living

History Days, Confederate Reunion Grounds SHP, Mexia, (254) 562-5751.

March 23: Texas Colonial Heritage Festival, Stephen F. Austin SHP, San Felipe, (979) 885-3613.

March 23: Black Bean Incident Mural Rededication, Monument Hill & Kreische Brewery SHS, La Grange, (979) 968-5658.

March 23: Fly-Fish Texas 2002, Texas Freshwater Fisheries Center, Athens, (903) 676-BASS.

March 31: Easter Sunrise Service, Fanthorp Inn SHS, Anderson, (936) 873-2633.



SOUTH TEXAS PLAINS

March: Kiskadee Bus Tour, every Tuesday and Friday, Bentsen-Rio Grande Valley SP, Mission, (956) 519-6448.

March 9, 23: Bird Identification Tour, Choke Canyon SP/Calliham Unit, Calliham, (361) 786-3868.

March 23-24: Goliad Massacre reenactment, Presidio La Bahia, Goliad, (361) 645-3752.

March 30: Turkey season opens in 32 South Texas counties, (512) 389-4505.

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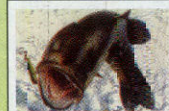
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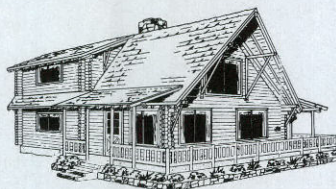
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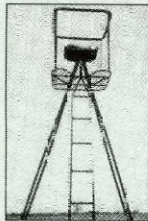
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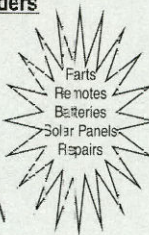
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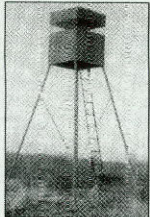


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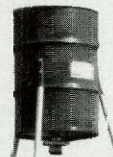
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