MULE DEER / LEAD SHOT / PADDLING COLUMBUS / PLANT PIONEER The OUTDOO TXD P 400.6 P235 67:09 Spotty rain means spotty conditions COOL SCHOOL Pg. 45







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SEPTEMBER 2009, VOL. 67, NO. 9

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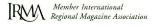
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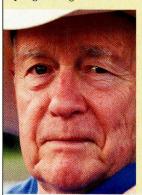
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In the Field

JOHN JEFFERSON has lived in or hunted, fished and camped in every region of Texas. He served as hunting and fishing regulations coordinator for TPWD, as well as director of information and education, before embarking on a freelance writing and photography career that's still progressing. The friendships and the respect he has for



TPWD biologists helped him gather hunting forecast information from across the state. John has written Hunters Guide to Texas, is coauthor of Texas Wildlife, and has contributed to most regional hunting and fishing magazines, including the first hunting article to appear in Texas Monthly. He currently edits the TPWD Outdoor Annual and is past president of Texas Outdoor Writers' Association.

STEVE LIGHTFOOT has been writing about and photographing the outdoors for three decades, and his award-winning work has appeared in numerous publications. Steve has been a disciple of the outdoors since he was old enough to follow his dad and grandpa into the East

Texas woods and is passing that heritage to his eight children, five of whom are adopted. He is a recipient of the Texas Outdoor Writers Association's highest honor, the L.A. Wilke Lifetime Achievement Award. At TPWD, Steve has followed wildlife research efforts during the last 16 years and communicated the findings. He's become adept at transforming "bio-babble" into words normal people can understand.



MEGAN WILDE counts burros, botanizing and the Big Bend among life's finest offerings, so she was thrilled to write this month's article about botanist Mary Sophie Young's burro expedition across far West Texas. Megan first learned about Young during a training program for the



Texas Master Naturalists. She has often thought of Young while hiking around the Davis Mountains and Big Bend, where she lives in Alpine with a burro, a horse, four cats and her artist husband. "If I'm ever on a hike that turns into a debacle and feel the urge to complain," Megan says, "I try to imagine Mary in a long skirt and highlaced boots trudging up the same slope nearly a hundred years ago."

AT ISSUE

FROM THE PEN OF CARTER P. SMITH

Theon. Walburg. Schwertner. Jarrell. Corn Hill. Bartlett. I suspect these communities aren't on everyone's list of places to see and visit, but they most certainly were on mine as a kid growing up in central Texas. Our family owned a little blackland farm in that part of then-rural Williamson County. We shared the countryside with a large lot of hard-working, mostly Czech farmers who tilled the blackland soil to produce grain sorghum, cotton and corn. On the side, they all raised a few cows for beef and milk.

Come September, the population grew quite a bit, at least in the late afternoons and weekends. The sight of men in overalls was augmented substantially by men in a little different outerwear—camouflage. Dove season had finally come around again, and those crop fields, pastures, treelines, sunflower and ragweed patches, and occasional creek bottoms offered some pretty fair wing shooting if you caught the birds just right.

I should know. I spent every moment of discretionary time I had patterning the feeding, watering and roosting flights, and ultimately traipsing all over that farm trying to position myself just right when the birds came by. I'd start early and come home late. If the birds were going to sunflowers in the upper field, I was there or soon headed there. If they were coming to water, I was at the stock tank. If they were flying down the creek, I would crouch under a favorite mesquite tree to await them.

In my sweet mother's eyes, I probably should have worried more then about sunscreen, snakes, ticks, drinking enough water, remembering not to inadvertently spray the farmhouse roof with pellets and getting my homework done. But I didn't. Getting a limit of doves was important for bragging rights back at school, but grew less and less so as I got older. Ultimately, it was more about an excuse to get outside, to unwind, to spend time with close friends and to explore and enjoy a piece of Texas I dearly loved.

I smile just thinking about it.

September marks a rite of re-entry for many of us who enjoy time afield. Dove and teal season are open. In October, the bows come out, and in November, so do the rifles. In fact, throw in quail, ducks, geese and turkeys, and there is quarry to pursue all the way through May. If you are interested in hunting feral hogs and exotic animals, you can do it year-round.

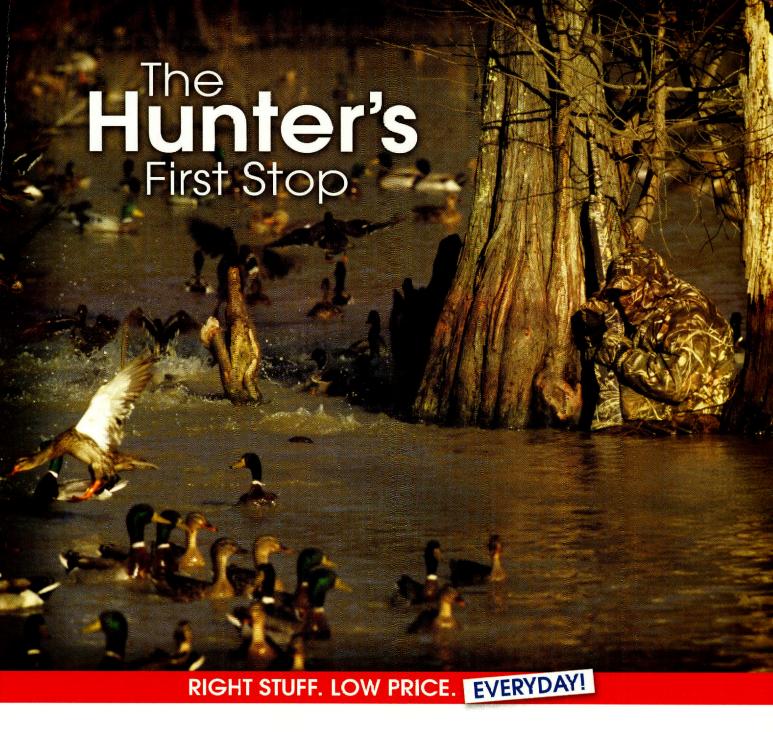
Our state has around a million hunting enthusiasts. Come September, 300,000 or so of them will start to enjoy what is unquestionably one of Texas' great pastimes — dove season. If you are one of them, I ask you to do four simple things: Be safe, respect the property on which you hunt, honor our game laws and take someone with you, particularly a child, who otherwise wouldn't get to go. They will be forever grateful, and so will you.

Thanks to all of you for caring about Texas' wild places and wild things. They need you more than ever.

EVECUTIVE DIRECTOR

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To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.





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PICKS, PANS AND PROBES FROM OUR READERS

FOREWORD

Who are we? Occasionally I receive comments and questions about *Texas Parks & Wildlife* magazine's editorial content — most are quite congratulatory, but some — well, not so much so. All are appreciated, however.

So who are we? Why so much variety in the articles? We write about wideranging outdoor topics for a couple of reasons. Texas is a very diverse state, so there is much to include, such as hiking, wildlife viewing, fishing, hunting and the science behind the management decisions. But also we represent the diversity of the agency.

The magazine's vision is to support the mission of TPWD, which is: To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

Just like the outdoorsmen who use TPWD's services, the magazine has readers who only hunt, or only fish, or only partake in non-consumptive pursuits; we have many readers who enjoy all of the above. I'm one of them. Well, I don't hunt much anymore, but I do everything else. Once in a while I get the hankering to go hunting again, so I buy a SuperCombo license every year, but mostly, I use the fishing license portion.

I used to hunt — a lot. I was a hunting guide for deer, elk, geese and ducks when I lived in the Intermountain West. I started hunting in August for the deer archery season and stayed at it through the end of the waterfowl season in late winter. When I wasn't guiding, I hunted on my own or built blinds or goose pits for my clients; I would do this nearly every day for six months.

There was only one problem with this (actually two, if you ask my wife). On those unusually warm fall days, when the game wasn't cooperative, I would wish I was fishing. So after few years of earning a living in hunting-related ventures, I went cold turkey and took up fishing again — big time. I became hooked on tournament bass fishing, which I still love to this day.

I would hope my interests mirror many of our readers. We're passionate about one aspect of the outdoors and we enjoy the diversity of all wildlife. We're tolerant of all outdoor activities

because we know we're in this together — no one group can foot the bill for all needed conservation efforts. By subscribing to Texas Parks & Wildlife magazine, you are getting the benefit of knowledge and entertainment, but you're also supporting TPWD's conservation efforts. Thank you.

Randy Brudnicki
Publisher

LETTERS

TOUGH CLIMB AT THE TOP

Ludos to Joe Nick Patoski and Laurence Parent for the outstanding article on the Franklin Mountains in the August 2009 issue ("No Hike for Old Men"). What they really conveyed is how much more difficult it is to hike in these

mountains than it would seem to be.

About 15 years ago, a good friend and I walked out of his home at 7 a.m. near the corner of Mesa Hills and Stanton. Our destination was to go directly east to the ridge of the Franklins. We were both experienced backpackers and climbers, so we thought the Franklins wouldn't be much of a challenge.

Wrong! Between the loose scree and the omnipresent cacti, and having to pick up his dog for the hand-over-hand parts, we were already beat by the time we finally got to the top. We were treated with the great views of the east side. When we returned to his house, it was almost pitch dark, and we just showered and collapsed in bed.

Thanks for highlighting these great mountains.



ADVENTURE

Stan Peyton Austin

beat by the time we finally

got to the top.

STAN PEYTON
Austin

BLUE-GREEN ALGAE TOXIC TO DOGS

The Texas Parks and Wildlife Department has been very helpful to me through the years with a pond that I manage. When my 90-pound black lab ate some algae at the pond, he became violently sick. The vet said that it may be

MAIL CALL

blue-green algae, which is very toxic and attacks the liver.

I called Rafe Brook at TPWD, and he put me in touch with Joan Glass, Fish Kills, Waco. Joan put me in touch with Chetta Owens with Texas Corps of Engineers. They sent someone to the pond the very next day to test the algae. It was identified as blue-green algae.

This is a happy version of "I'm from the government and I'm here to help you!" After five blood transfusions and a week of intensive care hospitalization for my dog, he is now doing fine.

A lot of professionals know that bluegreen algae is life threatening. Yours is a fine article ("Blue-Green Mystery, July 2009), but ingestion of this algae can be fatal, which goes far beyond just health impacts. I think that the public should know this.

MARTIN LYFORD

Dallas

NEED MORE PUBLIC LAND HUNTING

Thave grandsons who are interested in deer hunting, and I have provided them with some hunting opportunities. In the future I do not see how me or their parents can continue to pay the tremendous prices that the new generation of landowners demand. We consider ourselves middle-income families, but in the very near future, only the very richest will be able to afford Texas deer leases.

I would like to see more public land hunting made available to average middle-class families. The hunting licenses are already expensive, but I for one would be willing to pay even more if more hunting opportunities could be created for average families.

Wayne E. North
La Grange

IN DEFENSE OF HEATED BLINDS

This letter is a response to "A Far Cry From Years Ago" in your January 2009 issue. I write in defense of the hunters who sit in heated blinds in hopes of seeing any kind of wildlife.

I am a South Texas woman hunter and love every minute of it. I have spent

hour upon hour in my heated blind (which I hardly ever turn on) hoping to see any kind of wildlife. I hunted fiercely this year, and have for many years, and never shot a deer.

It is wonderful to watch the wildlife (deer, coyotes, hogs, turkeys, bobcats, skunks, squirrels, birds, gophers, javelina, raccoons and badgers), only to end the day by watching the most beautiful sunset anyone has ever seen from a South Texas deer blind. I love watching how the deer interact with each other when wild hogs chase them off, and how 12 keen-eyed tom turkeys appear looking for corn under the feeder.

With the drought this year, wildlife has been moving at different times of the day and night looking for food and water. I think it is a good thing for hunters to sit in heated deer blinds and feed the wildlife — otherwise they would have had a tragic winter and spring.

A lot of people can't afford an expensive hunting lease, and the small tracts people hunt on are becoming scarce as subdivisions are moving in. You can't

walk and stalk - you have to sit and wait.

Face it, nothing is the same as it was years ago, but thank God for the small-time hunters — we can still enjoy our heated blinds and wildlife.

A SOUTH TEXAS WOMAN HUNTER
San Antonio

Sound off for "Mail Call!"

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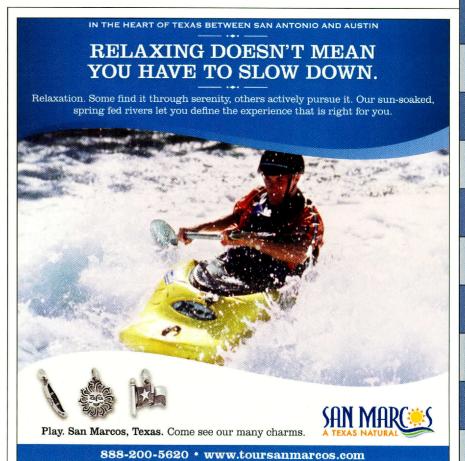
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NEWS AND VIEWS IN THE TEXAS OUTDOORS

LONESOME DOVE FEST

Annual event gives kids the chance to learn about the outdoors.

Karnes County's Lonesome Dove Fest,

set for Sept. 18–19, was an idea hatched as a hay patch gathering of hunting buddies, fathers, sons and even a few sharp-shooting women.

Contrary to its name, the darting aerial acrobats known as the grey ghosts of fall were far from "lonesome" doves, but, at times, filled the sky in numbers that caused even veteran shooters to

experience opening day jitters.

That has been the pattern of the annual festival, which will celebrate its 18th year on the opening weekend of the South Zone mourning and white-winged dove season. The festivities are headquartered at the Karnes County Show Barn just off U.S. 181, about 60 miles south of San Antonio.

About 500 hunters attended that first gathering in 1992. At the 2008

celebration, nearly 8,000 hunters and their families came to watch celebrity and team sporting clay competitions, to see numerous exhibits and displays, including the Texas Parks and Wildlife Department Wall of Shame, and to sample fine fare prepared during a cook-off competition that also featured wild game dishes.

"We started with no exhibits, no auction and no electricity except for a generator out in the middle of IIO acres," said Larry Hedtke, one of the festival's founders.

"This event has continued to grow and we are getting more and more support from sponsors and the community," he said.

"When we started, one of our goals was to put hunters together with landowners that wanted to lease their property," Hedtke added.

The liaison effort between hunters looking for land to lease and landowners looking for hunters has blossomed into a pipeline funneling hundreds of sportsmen into the area every year.

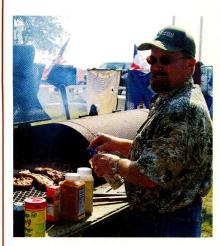
In addition, the clay target events at the festival have been designed to tune up the shooting skills of the visiting and local hunters — attracting as many as 300 participants.

However, the main focus of the activity is the education of youngsters about the outdoors. The first day of the festival is devoted to area high school students. More than 300 youngsters visited the event in 2008 on officially sanctioned school field trips.

Outdoor skills, historical re-enactors at



Bring the family to celebrate the start of dove season at the Lonesome Dove Fest.





campsites, game law presentations by department game wardens, wildlife activities, shooting and poating simulators, bass casting and shooting safety instruction are just a few of the learning opportunities that have been presented to the students.

Area youngsters also are the main benefactors of the festival. In the past, the Karnes City Rotary Club has used proceeds to award college scholarships to graduating seniors from all four Karnes County high schools, purchased Jaws of Life equipment for emergency medical service crews, constructed little league fields, promoted shooting sports for area youngsters, contributed to volunteer education programs, and even provided Christmas gifts to needy area children.

To this end, the Karnes City Rotary Club has adopted the following mission statement for the event:

"Lonesome Dove Fest is a celebration of traditions and outdoor lifestyle of South Texas for local residents, visiting hunters and especially kids to enjoy."

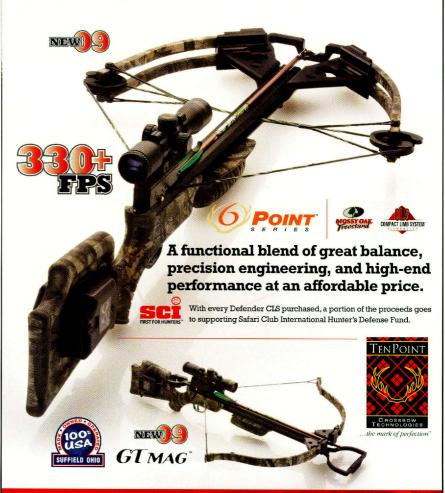
Information on the various events at the festival is available at (830) 780-2670 or (830) 780-3314, or on the Web at www.lonesomedovefest.com.

- Ra!ph Winingham



A variety of activities await thousands of visitors to this year's Lonesome Dove Fest. Proceeds provide scholarships and benefit many other programs.





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Harvest Hayrides

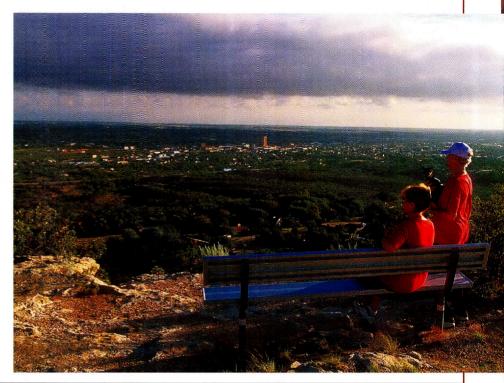
Enjoy amazing scenery and a taste of history at Big Spring.

Pioneers who settled across Texas

typically carried a repair kit in their mule-drawn wagons that included a hammer and chisel. Using the tools in 1896, Thekla Scholz, a young German girl, carved her name into a limestone bluff that's now part of Big Spring State Park.

"She had eight siblings, and her family had a homestead and cotton farm at Marienfeld, which is now Stanton," says Ron Alton, park manager. "We have other carvings along the bluff, too, and some are fairly ornate."

Little else is known about Thekla, but you can hear other history stories and learn about the park's biology aboard a modern wagon (actually a flatbed trailer pulled by a pickup). As in years past, park staff will once again host Harvest Saturday, a fall event filled with evening hayrides around Scenic Mountain.



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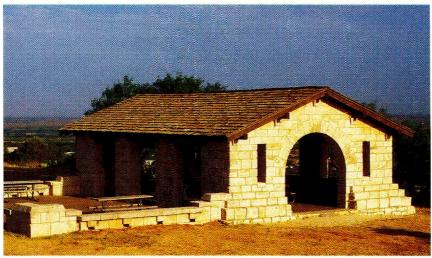




www.shootingwesttexas.com







Gray foxes and opossums are among the wildlife that can be found at the park. The Big Spring Pavilion offers a place for large groups to picnic.

"We tour visitors along Scenic Drive, a three-mile road that loops around the mountain and follows the ledge of our 200-foot limestone bluff," Alton explains. "On clear days, you can see 28 miles to Stanton, and sunsets are pretty amazing."

Bring snacks or a picnic so you can come early and explore the 382-acre park, open for day-use only (no camping facilities). Both the park and city of Big Spring were named after a natural spring that stopped flowing after the turn of the century, but once drew early explorers, Indians, settlers and cattle drovers.

Check out the park's cool limestone architecture, built in the 1930s by young men employed with the Civilian Conservation Corps. From limestone quarried on site, they constructed an open-air pavilion, headquarters, a residence, pumphouse and restroom, not to mention the amazing three-

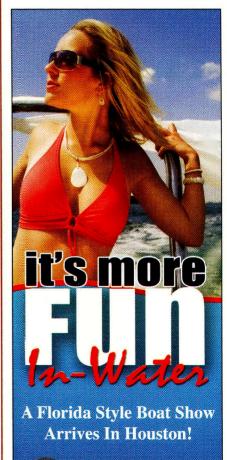
mile loop and its retaining wall.

If you're lucky, you may spot a horned lizard, a threatened species whose numbers have declined sharply in the past 30 years. "We still have plenty of harvester ants, their only focd source." Alton says. "Fire ants aren't a problem here yet. We also have lots of other wildlife, such as raccoons, ringtails, opossums and gray foxes."

Steep grades make the scenic road a favorite with walkers, runners and cyclists. The park also has a 2/3-mile nature trail and an interpretive center with Indian artifacts and fossils.

Harvest Saturday, set for Sept. 26, runs 3 to 6 p.m. Hayrides depart at 3 and 4:30 p.m. No fee, but donations accepted. Big Spring State Park is located halfway between Abilene and Odessa off Interstate 20. For information, call 432-263-493I or visit <www.tpwd.state.tx.us/bigspring>.**

- Sheryl Smith-Rodgers





South Shore Harbour Marina, Bay Area Houston, September 24th - 27th, 2009

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Sept. 20 - 27:

Texas Clipper; reef fish; get SCUBA certified; dive the state's newest artificial reef.

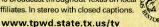
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RADIO

YOUR RADIO GUIDE TO THE GREAT OUTDOORS

September brings cool temperatures and even cooler programming on Passport to Texas. Learn about an in-depth documentary on Palo Duro Canyon airing this month, hear an 11-year-old's adventure with a giant turtle, and a lot more.

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PASSPORT TO TEXAS

Join host Cecilia Nasti weekdays for a 90-second excursion into the Texas Outdoors. Find a station near you, or listen on the Web at www.passporttotexas.org





Sweetgum

They can reach towering heights and produce surprising fall color.

Step barefooted on a spiked seed ball

dropped from an American sweetgum, and you're sure to yelp. For that reason, some people despise the tree. Not Randy Scott, a retired project manager who advocates planting more of the species around his neighborhood in The Woodlands.

"Sweetgums are hidden jewels," he enthuses. "Nobody really notices, but they have absolutely beautiful little green blooms in the spring. I also like how the green color of their starshaped leaves contrasts against the darker green of our pines."

Best of all, in the autumn sweetgums blaze into brilliant hues of burgundy, orange and gold.

Liquidambar styraciflua — the only member of the sweet-gum family that's native to North America — inhabits moist bottomlands of East Texas and is favored as an ornamental. Conical in form, sweetgums can reach towering heights of 100 feet or more. Although fast growing, the species doesn't produce seeds until 20 years of age or older.

When wounded, the sweetgum's furrowed bark

bleeds an amber resin, a sticky substance once chewed as gum by Native Americans and pioneers. Commercially, sweetgum hardwood is crafted into furniture, flooring, veneers and cabinetry. As for the seed balls, squirrels and chipmunks as well as more than 20 species of birds — including turkeys, doves, cardinals and yellowbellied sapsuckers — eat their fruit.

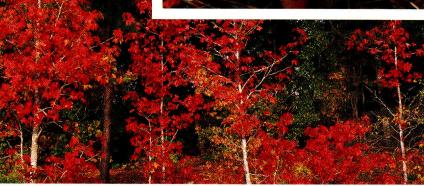
Scott finds the barbed husks useful, too. "I work them into my sandy clay soil for aeration," he says. "And when I do, I always wear shoes." *

- Sheryl Smith-Rodgers









The star-shaped leaves of the sweetgum blaze with color in fall. The fruit turns to a spiky seed ball coveted by squirrels and birds.

LEFT © SUSAN M. GLASCOCK; TOP RIGHT © BILL BEATY; OTHERS © LANCE VARN



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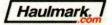












American Eel

The strange life cycle of a (mostly) freshwater eel.

Three years ago, Jennifer Bixby fought hard to reel in her fishing line at a Port Lavaca pier. "I was ready to cut it," she recalls. Then, unexpectedly, she landed her catch—a slimy, serpentine American eel (*Anguilla rostrata*).

"I'd never caught one before nor seen one either, but I knew what it was from my college classes," Bixby says of the fish species. Nowadays, she's got another eel in her life. This one lurks in a saltwater exhibit at Sea Center Texas, where she works as a hatchery biologist.

Pulled from Galveston Bay's brackish waters, the male eel someday would have migrated back to the faraway Sargasso Sea northeast of Bermuda. Why? Amazingly, all American eels end their complex, often lengthy life cycle where they began.

No one's ever documented their breeding behaviors, but biologists believe that American (and European) eels die soon after spawning in the Sargasso Sea. The transparent larvae (called leptocephali) drift with ocean currents and morph into "glass" eels. For a year or so, the transparent juveniles float until they reach coastal waters, which can be anywhere from Greenland to Brazil (including the Gulf Coast).

Moving into estuaries and rivers, the grayish or greenish "elvers" turn into sexually immature "yellow" adults. (Before modern dams, American eels once ranged upstream as far as

New Mexico and the Red River.) Hiding under rocks by day, eels feed at night on fish, fish eggs, worms, clams and frogs. At maturity, females can measure 3 to 4 feet long and weigh 4 to 5 pounds whereas males generally reach 1.5 feet long and 3 pounds.



American eels absorb oxygen through their skin as well as their gills.

American eels are North America's only catadromous species, meaning they live in freshwater but spawn in the ocean. (The life cycle of anadromous fish, like salmon, goes the other way.) After three or as many as 30 years, the eels turn "silver." This final stage readies them for ocean travel with enlarged eyes, ample reserves of fat and a thicker, darker skin.

Finally, off they go, headed back to the Sargasso Sea to complete their life cycle — unless they happen onto someone's fishing line. \bigstar

- Sheryl Smith-Rodgers

Collect the Artwork of Conservation



Each year Texas Parks and Wildlife publishes a set of collector stamps featuring artwork from some of the finest wildlife and sporting artists.

These special edition stamps are available for purchase as a set of six stamps, a print, or a set of both stamp and print. They make a great gift or personal collectible for any outdoor enthusiast!

Stamp sets cost just \$21.65, and unframed print and stamp sets start at \$150.

When you purchase one of the stamps or prints, a share of the proceeds goes to support conservation efforts in Texas.



Visit www.tpwd.state.tx.us/shopcovey to collect the artwork for conservation.

Taming the Land

The Lost Postcard Photographs of the Texas High Plains.

It didn't take long after the first photographic postcards appeared in America before Texans were enthusiastically mailing them off to friends and family. The postcards were often per-

family. The postcards were often personal, featuring pictures of relatives, special events and the family homestead.

In fact, the proliferation of the picture postcard and the history of photography in Texas go hand-in-hand, a phenomenon explored with zeal by author John Miller Morris. Taming the Land: The Lost Postcard Photographs of the Texas High Plains (Texas A&M University Press, 2009) is the first volume in Morris' series called "Plains of Light," a visual record of West Texas life

captured by postcard photographers of the early 1900s.

"Between 1900 and 1910 photography diffused across the entire Panhandle," Morris writes. "Farmers and ranchers had closed the frontier, while railroads had introduced industrialized culture to almost every corner. If not the best of times economically — there was a drought here and there — it was certainly not the worst. American culture in general

was in a mood of permanent celebration. A national spirit flourished, one that nurtured commemorative photography from national expositions to local main streets."

These commemorative photographs were called "real photo postcards" because the negatives were used to print directly on photographic postcard paper. Many of the surviving images, along with Morris' well-researched text, serve as documentation of the Texas West during its initial and most prolific growth. The postcard images included in *Taming the Land* are annotated with geographic and historical information, and the author has also provided the postcards' handwritten messages.

"The messages that people wrote on the

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postcards are an appealing aspect of the medium," Morris explains. "While some messages refer to the photo scene on the opposite side, other semiotics are often at work. Many young men and women documented their youth, friendships, and romances with real photos."

An example is the message from "Monroe" in Canadian, Texas, to Miss Dell Courtney in Clovis, New Mexico: "Well here I am and not a word from you. What is wrong. Now you can see what is on the face of this card. Well this is what will happen if I don't get a letter from you tomorrow. By By — Monroe."

The message is humorously paired with the postcard depiction of a dramatic train wreck on the AT&SF Railroad near Canadian.

Of equal interest are Morris' brief biographies of the postcard photographers' lives. "Oddly enough." Morris reports, "most of the photographers presented herein rarely ventured from their chosen region, as if they were bound to the land by affections and sentiments too great to ignore."

One such photographer, Maidens Stennett Lusby, captured some of the finest early images of Palo Duro Canyon. His beautifully composed photographs inspired a movement to preserve the Palo Duro landscape. But as Lusby aged, his eyesight — the photographer's foremost tool — began to

fail. Morris' talent as revelator shines here as he follows the photographer's life story, just as he has done in each biography, to its final chapter.

"In November 1947 at the age of eighty." Morris writes, "he traveled to Corpus Christi, registered in a hotel under an assumed name, and bought a new sports coat. On the twenty-fifth he rowed out into the bay at

3:00 p.m. carrying a suitcase. Near dusk he pulled a heavy chain from the suitcase and tied it around his waist. He secured it with a new padlock also from the suitcase and jumped overboard."

Unfortunately identities and images of many other Panhandle postcard photographers have been lost to time. Yet Morris has done a fine job of gathering and analyzing the remains, then constructing portraits of the men and women who were, perhaps unwittingly, responsible for capturing much of our Texas past. Taming the Land represents the first volume in an ambitious collection of early 19th-century photography. For Texans specifically, it archives a vital era in the evolution of the Lone Star State. **

Get Outside and Bring the Neighbors

Nurturing your own family nature club.

One of our favorite family outings

is to head out in search of new places to hike. My husband and I are not exactly hard-core outdoor types, but we have enough of a foundation in nature to provide us with a basic understanding and a love of outdoors to give us the impetus to get outside and explore. Because of this foundation, even if we're uncertain about a particular destination, we know enough seriously hard-core nature explorers that are more than willing to either guide us themselves or just point the way.

For many parents, particularly ones who didn't grow up with any hiking experience, the idea of heading outdoors may be enticing but doesn't always feel doable for a variety of reasons. There may be lack of knowledge about where to go or how to go about getting there. There may be a fear of snakes or poison ivy or some other potential hazard. There might also be a fear that they don't have the right gear or information.

And sometimes, too, even if there are no hidden fears of dangers lurking, there just might be a hesitation to venture out on their own where they haven't ventured before.

In the past few years, in many cities, towns and neighborhoods, many families have been forming family nature clubs to explore the outdoors together. These informal clubs were the brainchild of a family inspired by the book *The Last Child in the Woods* by author Richard Louv. The Children and Nature Network, founded by Louv and others to encourage nature play for children, hopes others follow the family nature club lead.

"What if more and more parents, grandparents and kids around the country band together to create outdoor adventure clubs, family nature networks, family outdoor clubs or green gyms?" Louv says. "What if this approach becomes the norm in every community?"

In the past couple of months we have become part of a neighborhood-based family nature club, which sets destinations monthly in and around Austin. One



dad set up a blog and invited others via the blog and the school newsletter. Forming your own club is easy and a good way to build community. There is no need to form committees or get funding or wait for a reason. Rather, the only reason necessary is that you want to get outside and you want to encourage other families to do the same.

By joining forces and forging a simple path to the outdoors, many families have discovered that getting out on a trail or park or other natural setting is the best way to connect — not only with nature but with friends and family as well!

And here are five simple steps from the Children and Nature Network for forming your own family nature club:

- I. Create a plan of when, where and how long. Keeping it simple and close to home will encourage even the most nature-intimidated. Schedule for a variety of activities. (See "50 Ways to Hook Kids on the Outdoors," March 2008.)
- 2. Check out your location ahead of time. You don't need to know the trail like the back of your hand, but having some expectations of what you will encounter is a good idea.
- **3. Send out your invitations.** You can do this by word of mouth, Internet newsletters, school information folders or



Family nature clubs provide an easy way to explore the outdoors with kids and neighbors.

neighborhood bulletin boards.

- 4. Provide a checklist of what to wear and bring. Leave nothing up to chance so as to encourage the hesitant. Think sunscreen, hat, water, good shoes, snacks, hand wipes, etc. Include any special equipment they might need (binoculars, fishing gear).
- 5. Gather, hike and record. Gather at the spot and get hiking. On your hike record what you see, water levels, number of participants, etc. Having a record of what was happening when you started is a great idea.

You can download a free Family Nature Club Tool Kit at www.child renandnature.org ★



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Days in the Field / By Rusty Middleton

DESTINATION: COLUMBUS

TRAVEL TIME FROM:

AUSTIN - 2 hours / BROWNSVILLE - 5.5 hours / DALLAS - 4 hours HOUSTON - 1.25 hours / SAN ANTONIO - 2 hours / LUBBOCK - 8.5 hours / EL PASO - 11.25 hours

Paddling Mayberry

Columbus offers a unique opportunity to paddle in circles.



We tend to think of rural communities

like Columbus as molasses-slow, quiet, Mayberry kinds of places, where an uptick in sorghum futures is what passes for excitement. But somehow Columbus never quite got that message. Perhaps nowhere else can you find such a bewildering yet charming combination of cultural and outdoor pursuits.

If you timed it just right, it would be possible in and around Columbus to attend a dinner theater in an 1886 opera house, canoe, hunt geese, go antiquing, tour one of the most historic towns in Texas, watch endangered prairie chickens engage in bizarre reproductive acts and visit the only Santa Claus museum in Texas, all in the same frenzied weekend.

I was certainly curious about any town with a Santa Claus museum and lust-crazed chickens, but my main focus was to hit the river. I wanted to canoe the Columbus Paddling Trail on the Colorado River, opened by the Texas Parks

and Wildlife Department and the Columbus Convention and Visitors Bureau in May 2007.

What I got, besides a sunburn, was a great river experience plus new and unexpected perspectives on Texas history, Texas outdoors and the distractions of romance.

But that's getting a little ahead of myself. Did I mention the sunburn?

The Colorado River near Columbus gets a little loopy — literally. It is supposed to be headed southeast and downhill toward a union with the Gulf of Mexico. But at Columbus, for reasons best known to hydrogeologists, or perhaps some other "ologist," the river has decid-

ed to flow due north for a while. Gravity finally wins out over this futile contrariness, and the river flows south again, taking a 6 1/2-mile detour to return to a point less than a mile downstream.

This meander turns out to be very convenient for paddlers. In Columbus you can take a 6 I/2-mile canoe trip and wind up almost where you started. That means a lot less fussiness about shuttling vehicles and people. If you bring your own boat, you can launch at the paddling trail's putin site just under the Highway 7I (Business) bridge in Columbus.

If you want to rent a boat, you can cross the bridge and go just downstream to Howell's Canoe Livery. Frank Howell and his wife, Evelyn, are the only game in town when it comes to canoe/kayak/tube rental, but they definitely don't act like it. Both are very helpful and friendly. Frank Howell downloaded the application from the TPWD Web site, filled it out and, with the help of TPWD staff, started the

process of creating a paddling trail. (For more information about Texas Paddling Trails, go to www.tpwd.state.tx.us/fish boat/boat/paddlingtrails.)

Frank shoved us off from his dock.

"Keep a lookout for bald eagles," he yelled. "They fly up and down the river."

We let the current catch the boat and begin to take us downstream. Suddenly our main goal in life was not, as we originally thought, to retire comfortably. Instead, it was now to make it down the river and have a good time doing it.

Howell's dock slowly disappeared from view, and the serenity of the river enveloped us. In the quiet, our voices suddenly seemed way too loud. A river mindset settled in. Whatever I was thinking while standing on the bank a little while ago seemed irrelevant now.

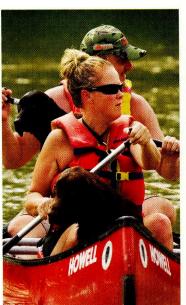
While you are on it, you belong to the river, so you have to adjust your thinking down to the basics. You are now in a place where reflexes count a good deal

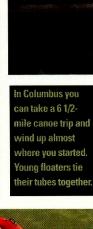
more than intellect, where judgment is about little more than timing your paddle strokes to avoid a tree limb. Your main job in life is to keep the boat upright, and in this section of the Colorado, that is not too demanding a task.

For most of the trail, the river is slow and broad, making paddling almost, but not quite, optional. You still have to steer around curves and the odd tree branch, but you can also spend a lot of time just floating along, deep in river-think, contemplating your place in a world where humans are mostly just visitors.

The residents here are fish, turtles and birds, especially birds. Yellow-crowned night-herons, egrets, flocks of teal and uncounted swallows, among many others, fill the air and riverbanks. Huge alligator gar roll on the surface in the deeper sections. Many paddlers come here just to see them. Alligators have been spotted a few miles downstream.

After a few hours of this dreamy float-













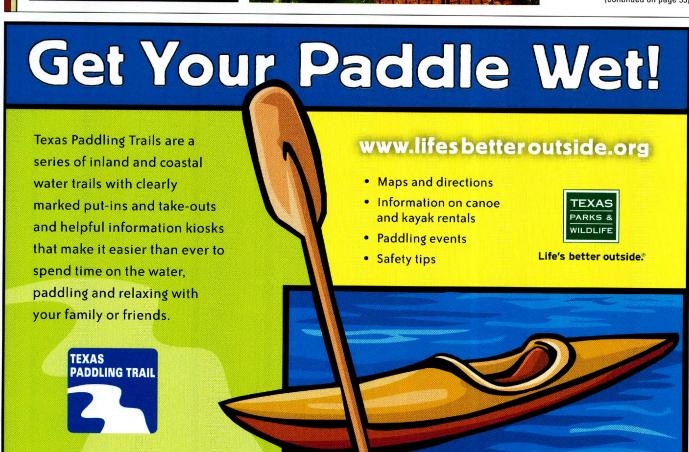
Clockwise from top: Confederate Memorial Museum and Stafford Opera House, both on the town square; Magnolia Oaks Bed & Breakfast; Ilse-Rau House (private home). ing and idle paddling, it is time to reluctantly look for the take-out point.

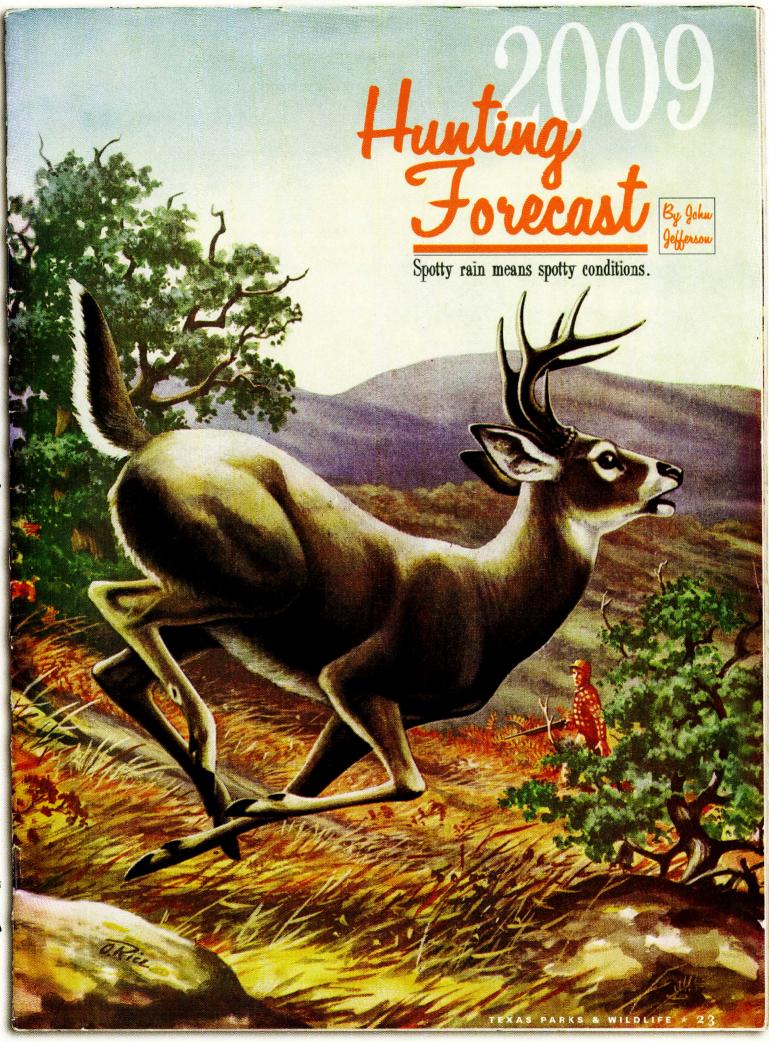
"Just after the two big bridges, look for Beason's Park on the left," Frank had instructed. The two bridges are large, by far the most imposing structures to be seen on the paddling trail. We got out at Beason's Park, yet such is the lure of the water, and reportedly each other, that a couple in a canoe recently missed these two massive structures entirely, plus the I-IO bridge further down, and managed to float another IO miles downriver.

They were getting seriously nervous by the time they were found around dark by TPWD game wardens.

Beason's Park, within the Columbus city limits, was formerly known as Beason's Crossing. It was at this and a couple of other nearby crossings on the Colorado that the Texan and Mexican armies engaged in a staredown for several days after the Battle of the Alamo.

(continued on page 55)





T'S WORSE THAN BEING a weatherman. Predicting hunting conditions for the fall before we know how severe the summer drought will be is more art than science.

A lot of factors are involved, includ-

ing reproduction and survival from the preceding five seasons. But at least the

following is predicated upon what the scientists in the wildlife division of the Texas Parks and Wildlife Department have observed.

Beware that ideal conditions for wildlife may well be the very influences that make hunting harder. Critters having plenty to eat is a good thing. But it also may mean that they don't move around to be seen by hunters. But then when it quits raining for any extended period, the opposite is true, and hunter success improves con-

siderably. You take the good with the bad, and just be thankful you can be out in the hills or brush doing what we call hunting. It's our heritage, and one of the factors that keeps us sane in a stressful world.

So, with that covering my, uh, credibility, here's a compilation of what the TPWD game biologists around the state have to say about hunting prospects.

DOVE SEASONS:

(Please report leg bands to 1-800-327-BAND)

North Zone Sept. 1-Oct. 25, Dec.

26-Jan. 9

Central Zone Sept. 1-Oct. 25,

Dec. 26-Jan. 9

South Zone Sept. 18-Nov. 3, Dec.

26-Jan. 17

Special White-Winged Dove

Area Sept. 5, 6, 12 and 13

Sept. 18-Nov. 3, Dec. 26-Jan. 13

CCORDING TO VERNON BEVILL, TPWD's small Agame program director, the statewide dove breeding population is around 20-25 million, and chances are good that the population will at least double during the breeding season.

In West Texas, district biologist Billy Tarrant, in Alpine, reports that both mourning dove and whitewing populations are in good shape. He expects cultivated areas will offer the best hunting.

Duane Lucia, in Lubbock, says that Panhandle numbers are also good, and that mourning doves started nesting in March. Whitewings are also increasing there. Chip Ruthven supervises the Panhandle wildlife management areas and says 2008 was a great year for dove hunters. He expects another fine season this year.

Charlie Newberry, in Henrietta, suggests that hunting over native sunflowers and croton should be productive. James Edwards, in De Leon, noted that wheat and oat production there seem to hold birds in the area. Gilbert Guzman reports that spring rains should bring up croton in the Menard-Mason area.

Most of the Hill Country had nice spring rains. In East Texas, David Sierra recommends the northern counties, but says Navarro County was excellent last year.

South Texas has been the mecca for dove hunters, and this year should be no exception. The areas just south of San Antonio and around Uvalde are loaded. Ashton Hutchins recommends the Frio-Zavala county area, and points to the four public hunting areas there. I'm ready!



Feral Hogs

HIP RUTHVEN WRITES, "Short of a nuclear winter, feral hogs should continue to increase throughout the (Panhandle) region." Many ranchers would like a winter that would nuke the hogs! They're everywhere, and multiplying. In the Hill Country, Guzman says they're all along the Llano and San Saba river corridors. Danny

Davis, a biologist in Ranger, reports they are flourishing in improved habitat and food plots. Sierra, in East Texas, says they provide excellent hunting opportunities, especially in bottomland hardwoods. South Texas district biologist, Alan Cain, agrees, saying the drought has relegated them to creek and river drainages.

FERAL HOG SEASON:

No closed season; landowner permission and hunting license required.

gavelina

TARRANT SAYS the javelinas appear to be on the rise, especially in the central mountains of the Trans-Pecos. They seem to him to be expanding their range to the north and west. Pittman says there are plenty of them on the WMAs. In South Texas, Cain reports an abundance of them.

JAVELINA SEASON*

(43 counties)
Oct. 1–Feb. 28
(50 counties)
Sept. 1–Aug. 31

Quail

LAST SEASON IN WEST TEXAS was dreadful. According to Tarrant, this one may not be much better. The best hunting will be on properties that have implemented good habitat management practices for quail. Some Gambel's quail can be found along the Rio Grande and associated drainages in the western portion of the region. Lucia, in Lubbock, expects a good hatch if the region gets some rain, since there was a good carryover of broodstock. Ruthven says the same for the WMAs: a mild winter and good carryover. Rains have picked up well; if this holds, prospects will range from "average" to "pretty good," depending on where you are hunting across this broad area. The Matador and Gene Howe WMAs definitely look better with recent rains.

Biologists in the Hill Country don't talk much about quail because habitat and drought limit their existence. Guzman, in Menard County, says bobwhites do a little better there, since the habitat is more compatible

with quail.

Soil and vegetation generate more groceries to the west and north, and Ralph Suarez, in Ballinger, writes that quail there are "holding their own" due to habitat management practices that allowed nesting cover to remain.

Raymond Sims, in Graham, also spoke to management practices and acknowledged that large ranches in his area "still make up some of the best bobwhite quail habitat remaining in Texas."

Moving east, it gets worse. Kyle Melton, in Hewitt, says quail numbers there have been declining for 20 years. Jennifer Barrow, north of Dallas/Fort Worth, reports a downward trend and unfavorable nesting conditions.

In East Texas, only one biologist, Ron Mize, even mentioned quail, and that was to add, "where the few are found."

It's better to the south. David Forrester, in La Grange, the district biologist for the upper coastal plains, expects "average to above-average" hunting. A.an Cain, district biologist for the Brush Country, says they need rain for a good hatch. Eric Garza, in Hebbronville, expects low numbers there, too, without rain.

Although conditions aren't ideal, David Synatzske, on the Chaparral WMA, reminds us that South Texas wildlife species are survivors and respond quickly. Brad Porter says the Three Rivers area had a good carryover of birds, and could recover with rain. Hutchins expects good hunting in Frio, Zavala and Dimmit counties.

So it's not all bad, and could get better. Just add water!

QUAIL SEASON:

Statewide (all counties)
Oct. 31–Feb. 28

Small Game

WITH LESS RAIN, there is certainly less salad for the rabbits. Consequently, Rufus Stephens predicts fewer rabbits in Comal and Kendall counties this year. But, being bunnies, they'll rebound quickly with any rain.

The place to take kids for good squirrel hunting will be East Texas. Sierra says the Post Oak Region, extending from Oklahoma between Sherman and Paris to south of Bryan, should be excellent. Gary Calkins, to the east in the Pineywoods, says the only limiting factor was that the hurricane knocked a lot of acorns off the trees last year.

Jeff Gunnels, on the Engeling WMA, says last season was one of the best ever, and this one will be good, too. All the WMAs tell the same story. With a \$48 annual public hunting permit, a lot of hunting is available.

SQUIRREL SEASON:

**Special Youth Season Sept. 26–27

East Texas (51 counties)
Oct. 1–Feb. 7, May. 1–31

Other open counties (See county listings in TPWD Outdoor

Annual) Sept. 1—Aug. 31

Wite-Tailed Dee

WHITETAIL SEASON:

(GENERAL SEASON)

Special Youth Season

Oct. 31-Nov. 1, Jan. 4-17

North Texas (206 counties)

Nov. 7-Jan. 3

South Texas (30 counties)

Nov. 7-Jan. 17

LATE ANTERLESS & SPIKE:

Edwards Plateau (39 counties)

Nov. 7-Jan. 17



Mule Deer

IN THE TRANS-PECOS, Tarrant expects average antlers, although the habitat is slightly improved from last year. Pittman says carryover was good on the WMAs.

Panhandle mulies are possibly increasing in number, according to Lucia, and antlers should be "average to increasing." Ruthven predicts "average to above-average" antler quality after a mild winter and good spring green-up on the WMAs. He cautions, however, that with growing herds throughout the region, antlerless deer harvest may need to be practiced in certain areas.

MULE DEER SEASON:

Archery-Only Season

Oct. 3-Nov. 6

General Season

Panhandle (38 counties)

Nov. 2-Dec. 6

SW Panhandle (10 counties)

Nov. 21-29

Trans-Peco (19 counties)

Nov. 28-Dec.13

TEXAS' 4 MILLION DEER suffered during the drought, but they are survivors. Here's how it looks.

Tarrant expects West Texas whitetails to have improved antlers. The population is above the long-term average. Lucia says Panhandle antler development also got a boost from spring rains, but some areas are still overpopulated. On WMAs, Ruthven says more antlerless deer need to be removed, but he expects bucks to have above-average antlers.

Kory Perlichek prepared the report for the Edwards Plateau, and said the 18-month drought was the worst on record. Ninety percent of the state was classified "abnormally dry." That took its toll. Dale Schmidt, in Llano, said last season produced very few trophy bucks. Then, just as it started greening up from spring rains, Blake Hendon, in Austin, noted that a late frost set back mesquites, Spanish oaks and post oaks.

Mary Humphrey, working the western counties of the Plateau, says that probably nixed a mesquite bean crop this year, and that's what pulled the deer through last year. It also nipped

a number of forbs. But nature has a way of compensating.

With less to eat across the plateau, Mike Reagan, in Wimberley, observed that the fawn crop was the lowest in 30 years. Spring rains brightened the picture. Ray Aguirre, in Kerrville, says that Bandera, Kerr and Real counties are going to be better than last year. "They've already received more rain than the last two years, combined," he says. Trey Carpenter, in Burnet, expects antler quality to be "average at best," however.

Up through the Rolling Plains, there's a little more optimism. Sims, in Graham, sends word that a good carryover of bucks resulting from a light harvest on well-managed ranches could make hunters happy this year. To the east, Dean Marquardt, in Granbury, forecasts an increase in antler development and age structure, primarily due to the antler restrictions that are having good effects. James Edwards, in De Leon, agrees with that.

Further east, Sierra says the Post Oak Savannah deer should have better-thanaverage weights and antlers, especially in the 13 antler-restriction counties. Calkins, in the Pineywoods, also lauds the restrictions and points to a large carryover of bucks, due to decreased hunting after Hurricane Ike.

The WMAs in East Texas expect good seasons, and Gunnels, on the Engeling WMA, speaks about seeing "really big, older age" deer there.

Forrester, working the coastal prairies where antler restriction started, anticipates average antlers as conditions improve. In the Brush Country, Daniel Kunz expects the poor body condition of most bucks will take time to recover, thus affecting antler development. Conditions were so bad that Dustin Windsor, in Cotulla, says that more than 60 percent of the ranchers there noted 8–14 less Boone & Crockett inches of antler.

Matt Reidy says antler restrictions for Wilson and Karnes counties, coupled with a conservative harvest last season, should put plenty of good bucks in the crosshairs this year. Heather Halbritter, biologist for Atascosa, Bexar and Medina counties, also says quality bucks walked last season, making some leases more attractive this season. David Rios, in Uvalde, says that the resilient South Texas brush species only need a little rain to bounce back.



UCIA TELLS US that pheasant numbers Llook to be average. Hunter success will probably depend upon when and how much rain falls, and what the farmers plant. And because of overlapping seasons, you could hunt four species of birds on one hunt: pheasants, ducks, geese and sandhill cranes!

PHEASANT SEASON:

Chambers, Jefferson & Liberty counties

Oct. 31-Feb. 28

Panhandle (37 counties)

Dec. 5-Jan. 3

Rio Grande Turkeys

EW PEOPLE HUNT strictly for turkeys in the fall, and most are taken incidentally by deer hunters. Turkeys are underutilized in West Texas, according to Tarrant, and have found near permanent water sources. Ruthven says the Panhandle hunters will see a number of two-year-old gobblers. In the Hill Country, Joyce Moore expects there will be a number of middle-aged and mature birds this fall. In North Texas, reports indicate fair hunting, in spite of wildfires that destroyed nesting cover. In South Texas, populations have declined in recent years, but Hutchins says turkeys are abundant along the Frio, Leona and Nueces river basins.

RIO GRANDE TURKEY SEASON

Archery - Only Season

Oct. 3-Nov. 6

FALL SEASON

Special Youth Season

Oct. 31-Nov. 1, Jan. 16-17

North Texas (122 counties)

Nov. 7-Jan. 3

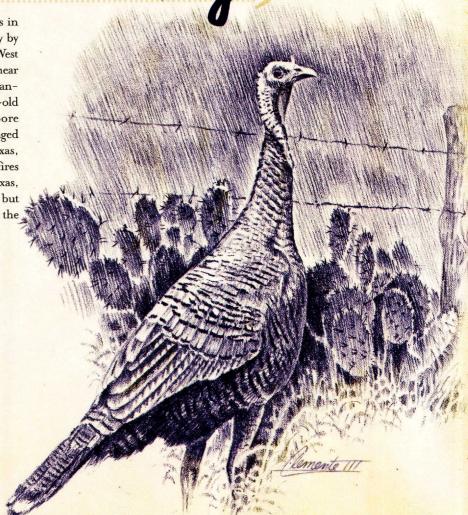
South Texas (26 counties)

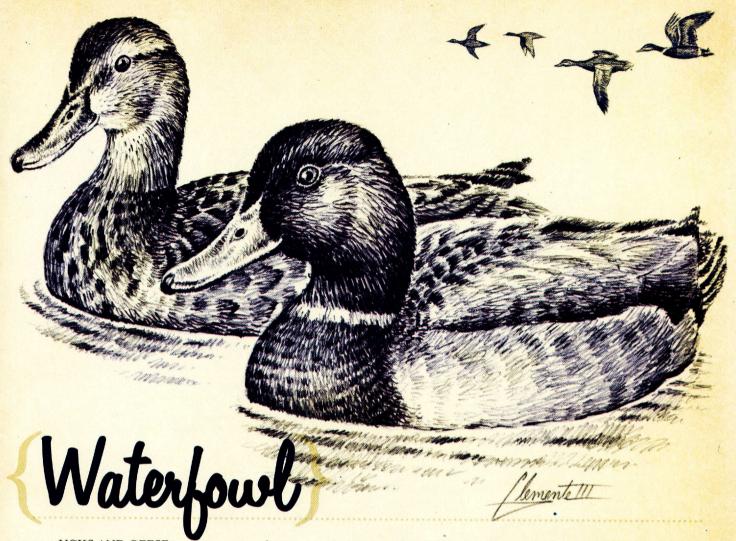
Nov. 7-Jan. 17

Brooks, Kenedy, Kleberg & Willacy

counties Nov. 7-Feb. 28

Fall season is closed for Eastern turkeys.





UCKS AND GEESE are migratory. They breed and nest in the north during spring and summer and come to Texas and other southern states for fall and winter. So, hunting prospects depend on balancing conditions in two very different parts of North America.

Most followers of the ups and downs of the waterfowl world look to the north to start the discussion. It stands to reason: If breeding and nesting break down in Canada, Minnesota, parts of Wyoming and Montana and the Dakotas, the population goes down, and the number of birds flying south for the winter is diminished. If conditions are ideal and the numbers are up, a bumper crop comes south. Then hunting depends on what has happened to the Texas habitat.

This year's story is a tale of two very different cities, so to speak. The north was wet. Ponds were plentiful and brimming. Ducks had water. Grass was abundant for nesting and cover. Even the red fox population was

down, so predation was reduced. It looks really good.

The Dakotas had pond estimates 108 percent above last year and 87 percent above the long-term average (LTA). All ducks important to Texas improved from last year, except wigeons. Mallards were up 10 percent. Redheads declined by a percent, but were still above the LTA. Scaup, which had declined, showed a 12 percent increase. Pintails were up 23 percent. Green-winged teal rose 16 percent and blue-wings increased II percent. Gadwalls, northern shovelers and canvasbacks also showed gains. Overall, the duck population is estimated to be 13 percent higher than last year, and 25 percent above the LTA.

But what will happen when they migrate to the lower realms? Will there be enough food and water to hold them, or will many move on to greener pastures in Mexico?

That's the question. Texas is dry—very dry—and may get drier before fall. El Niño is

expected to bring some relief, but will it come soon enough?

Dave Morrison, TPWD's waterfowl program leader, says, "(Ducks) moving to Mexico is certainly an option, but I suspect that most can find some place in Texas to spend the winter." If the drought continues, ducks could be concentrated on areas with managed water, he added.

As the Central Texas lakes shrink, there is at least a small amount of solace in knowing that some of the water being taken from the reservoirs to irrigate fields along the coast will also help hold waterfowl this winter.

With geese, reports from the north are another story. A late spring and high water retarded nesting. Most females simply did not nest. Nest failure was as high as IDO percent around Hudson Bay. Other areas also suffered. If you missed shots at a goose or two last year, be glad it's coming back to give you another try; you may not see many young geese this season.

M.U.L.E.D.E.E.R. NEW RESEARCH HOPES TO PROVIDE BETTER POPULATION ESTIMATES M.Y.S.T.I.Q.U.E.

TEXT AND PHOTOS BY RUSSELL A. GRAVES







won't take long to get on one and get him caught," predicts pilot Dusty Whitaker while his two-seater helicopter refuels behind us on the makeshift red-dirt tarmac. Just a short distance from the Caprock

Escarpment and west of Matador, our impromptu command post includes the helicopter, a couple of ATVs and a cadre of pickups. Stretched out across the ground, bright orange catchnets strike a peculiar contrast against the frost-killed grass, as a couple of Dusty's helpers pack the nets into the rocket guns.

"Once I get in the air, y'all need to have your crew ready to move in and get the deer and I'll take off and catch another."

Dusty makes the process sound simple, but having seen him do the catch-on-the-fly routine once before, I know the aerial acrobatics involved in this research project are far from simple.

While he speaks, a collection of Texas Parks and Wildlife Department biologists, college students (both graduate and undergraduate) from West Texas A&M University and Texas A&M University-Kingsville wildlife management programs and their respective college professors gather around in a huddle to listen for the day's agenda. In short order, various members of the group pore over maps of the ranch, delegate responsibilities for each crew member, and engage in jovial banter while Whitaker finishes his preflight routine.

The plan today is to catch 36 mule deer by day's end and catalog things like their sex, age and rump fat thickness to gauge their overall health. In addition, before their release, the crew will adorn each deer with ear tags to aid in identification and a GPS collar that logs their latitude and longitude over two-and-a-half months before they automatically fall off the deer and are retrieved by researchers using radio telemetry technology.

It's mid-December and the morning is overcast and predictably chilly by Texas Rolling Plains standards, but after hearing of the bevy of physical activity that's to come, there is no doubt that covered up in the heavy coats and gloves, we've all overdressed.

RESEARCH IN MOTION

After pulling up to an old barn that flanks a green wheat field on the ranch's western edge, mule deer quickly shoot from the cow lot and across the wheat field. At first I am fixated on the deer hopping toward a newly erected wind farm in the distance. Instantly, though, the recognizable chop-chop-chop sound of the helicopter blades erupts from the brush and the black chopper rushes past, only feet from the ground. Over the wheat field, I see an orange net open swiftly from beneath the aircraft's blades, and a puff of dust confirms that the first deer is caught.

In a smooth and choreographed fashion, the ground crew moves into action and sidles alongside the netted deer, loads her onto an ATV, and brings her back to the barn, where graduate research assistant Cody Zabransky helps coordinate the ground work under the guidance of his major professor, Dave Hewitt. Cody is here working with Texas A&M University-Kingsville under the Caesar Kleberg Wildlife Research Insti-

tute and is instrumental in the mule deer research project.

On the ground, the deer get worked over in a humane fashion. Their eyes are covered to calm them, and their feet bound to keep them from hurting themselves or the researchers. While does can injure with their flailing feet, the

review a topographic map (top right). The catch helicopter takes off on the first flight (right).

THE HELICOPTER CREW (top left) lays out the catch nets

before packing them in the

net guns. A desert mule deer

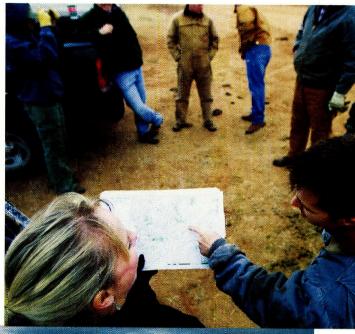
buck (top center). Dana Wright and Mike Janis

bucks are handled especially gingerly to avoid any damage to their antlers and keep their antlers from impaling a researcher.

While one researcher ear-tags the deer, another shaves a patch of hair from its rump so an accurate ultrasound can be administered and yet another records all the pertinent data marked by the various data collectors. In the end, whoever has the small digital camera at the time photographs the animal before it's released.







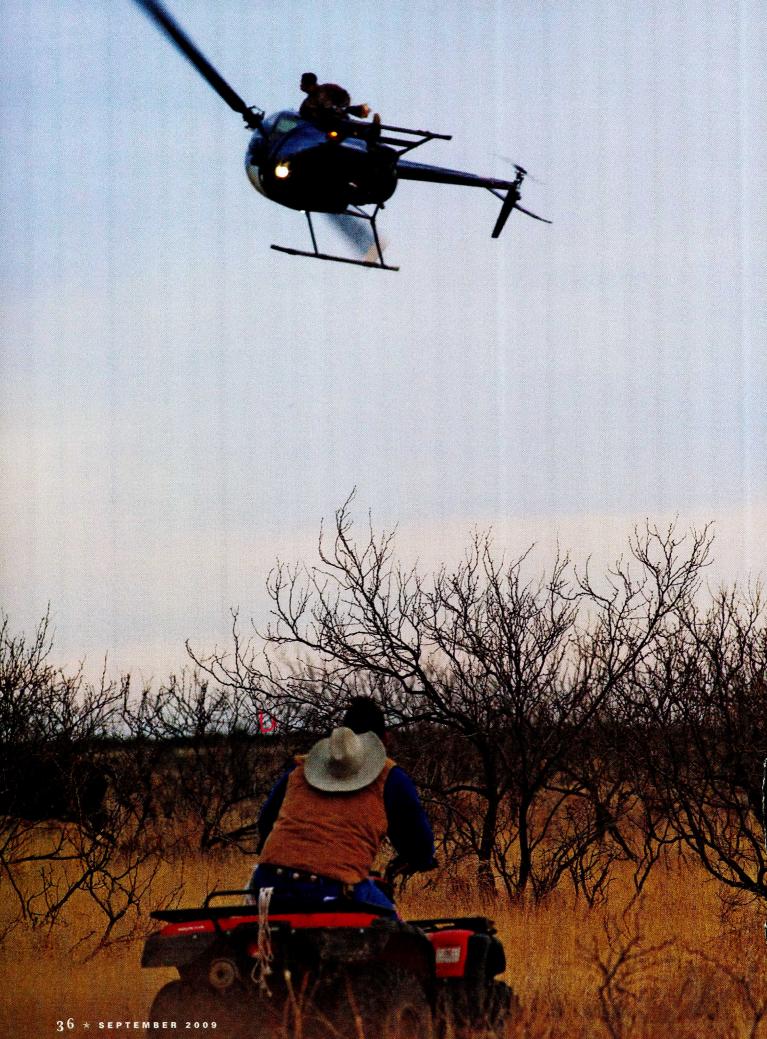


MULE DEER OCCUPY THE DRIER OPEN COUNTRY AND RANGE OVER AS MUCH AS 10 TIMES MORE AREA THAN WHITETAILS.

Back on their feet, most deer react the same way to the global positioning system collar and the ear tags, curiously shaking their heads while trotting off. Soon though, they become accustomed to their regalia and carry on as mule deer dc. While it seems like a lot of work just to figure out more about mule deer, when it comes to this project, there's much more to it than simply what I've witnessed.

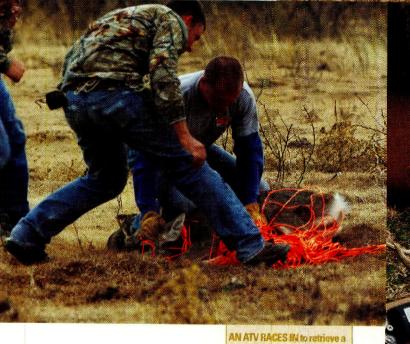
"The purpose of the research is to develop a sightability model for aerial surveys of mule deer in western Texas," explains Zabransky. "The Texas Parks and Wildlife Department currently uses data counts that do not estimate population levels, but instead provide population trend data."

According to Zabransky, when subjected to scientific scrutiny, the current method of counting mule deer employed by TPWD is highly variable and not as accurate as needed for critical population and habitat management decisions. Overall, the research assesses how the effects of terrain, vegetation type, woody cover, weather, deer activity, group size and observer experience influence signtability of mule deer during helicopter surveys. Researchers admit that the percentage of deer









observed during helicopter surveys is not known, and the percentages often vary due to a number of variables like brush cover or weather at the time of the survey.

Determining the actual number of deer on a range is a challenge using current techniques, and

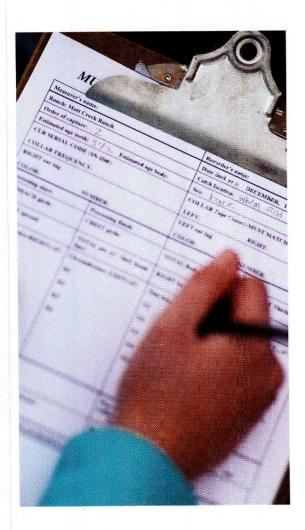
according to Calvin Richardson, desert big game leader with TPWD, spotlight survey results are often inconsistent due to the limited road systems on some West Texas ranches. Moreover, current aerial survey techniques typically underestimate deer numbers.

"The ultimate goal is to possess the ability to 'correct' our estimates following a helicopter survey under a specific set of conditions," says Richardson from his base in Midland. "More accurate population estimates at the state and ecoregion levels improve our ability to manage the mule deer population. Accurate data improves our decision-making ability regarding seasons and bag limits, as well as for any other proposals that may arise in the future, such as managed land deer permits or antler restrictions."

AN ATV BACES IN to retrieve a captured deer (opposite). (Clockwise from top left) Plastic ear tags for identification. A helicopter brings in a freshly netted doe. The deer are blindfolded to keep them calm. Researchers quickly remove a catch net from a deer.

In this particular research study, trapping takes place on six different ranches in the Texas mule deer range. Two of the ranches are in the Panhandle, while the balance are in the Trans-Pecos. Each ranch is big enough to ensure that the census methods developed from this project are applicable over the entire mule deer range.

"Mule deer are the focus of the study because they require a model of their own, as a model developed for white-tailed deer would not apply to mule deer because of different habitat types and behaviors of the two species," Zabransky notes.





As far as Texas deer, the desert mulie is the less-common cousin of Texas' most prominent deer — the whitetail. Because its range is found in the least populated regions of Texas, many people aren't as familiar with the deer that roams chiefly in the Texas Panhandle and the mountains and basins of the Trans-Pecos.

Historically, mule deer resided in nearly every Texas county west of the 100th meridian. By the middle part of the 20th century, over-hunting and habitat changes reduced their range substantially and pushed them into the desert mountains of western Texas and tiny pockets in the Panhandle.

Currently, because of a trap-and-translocate program that ended in 1988 and stricter adherence to sound habitat and population management philosophies, their numbers and range have expanded. The Trans-Pecos helds about 85 percent of the statewide mule ceer population.

In body size, mule deer are slightly larger than whitetails. The first thing you'll probably notice is its large namesake ears that resemble those of a mule. Typically, as mule deer bucks grow larger, their antlers branch dichotomously fork, as opposed to a white-tailed deer, whose times grow typically from a single main beam. While whitetails generally are found in the wetter and densely vegetative habitats in the eastern two-thirds of Texas, mule deer occupy the drier open country and range over as



much as IO times more area than whitetails.

Because of the innerent differences in white-tailed

and mule deer, management strategies vary between the two species. Therefore, from a wildlife management point of view, several concerns arise with the management of Texas mulies.

RESEARCHERS RECURD DATA (top

left) from each captured deer.

(Clockwise from top) Dr. David

Hewitt uses an ultrasound probe to

measure the rump-fat thickness of

a doe. A mule deer buck is

released. A collared and ear-

tagged buck heads back into the

brush. A researcher programs a

GPS collar.

"Intensive supplemental feeding is becoming a management concern from the perspective of most deer biologists," advises Richardson. "With good intentions, many managers provide year-round high-protein feed to prevent drought-induced fluctuations in deer numbers, and some provide feed to increase antler growth in bucks."

Richardson says that supplemental feeding typically benefits



WITH MORE ACCURATE POPULATION DATA, THIS RESEARCH GOES FAR IN HELPING PRIVATE LAND MANAGERS MAKE SOUND MANAGEMENT DECISIONS.

mule deer herds the first few years by inducing greater body weights and slightly larger antlers, but invariably, fawn production and survival increases to as much as 80 to 90 percent, and many fed deer herds triple or quadruple in numbers within the first 10 years.

"Since most managers are reluctant to harvest mule deer does, long-term overpopulation is inevitable. What most managers don't realize is that the feed composes only a small portion of the overall diet, and the majority of a deer's diet consists of native vegetation," Richardson advises. As overpopulation occurs, the highly preferred native plants are affected first by the browsing pressure, and the habitat experiences long-term decline, which ultimately reduces the carrying capacity of the land for deer and other wildlife, he says.

"Overall, the mule deer herd in Texas is in great shape due to the management efforts of private landowners in West Texas. Compared to other southwestern states, desert mule deer harvested in Texas tend to be more mature than in other states that have more public land, and sex ramos in Texas are tighter than in other states due to the conservative harvest of bucks in West Texas."

While Texas mule deer are doing well, that doesn't mean a hands-off management approach should be the rule. Instead, the catch-and-collar research is not only used to establish more scientifically sound census methods, but researchers are learning more about the western Texas deer and their habitat utilization. Additionally, because of the more accurate population data to come, this research goes far in helping private land managers make sound management decisions on a local scale.

"Biclogists have long recognized that a certain proportion of deer are missed during aerial surveys. A few deer are usually missed because mule deer are good at blending into their environment when they don't move — especially on overcast days." Richardson confides. "It's likely that the majority of deer that are missed are not even visible to the observers — like when they are standing or bedded in woody cover or rugged terrain. This research will ultimately help us to account for those deer that we've been missing."



Wildlife agencies worldwide await the results of an extensive TPWD study on lead shot use for dove hunting.

BY STEVE LIGHTFOOT

SEVENTEEN SETS OF TRAINED EYES

tracked the squadron of mourning doves riding a stiff breeze down the edge of the sunflower field in search of a prime feeding spot. As the birds crossed left-to-right 15 yards out, two shotgun reports in rapid succession sparked evasive maneuvers as birds dipped, darted and kicked in gray-feathered afterburners.

"Do you think you hit that bird?" queried the owner of one of the sets of eyes.

Many of the other sets were still glued to rangefinders, mentally marking a spot in the weeds where a bird may have faller or re-tracing the doves' flight paths.

"Which one?" retorted Tom Roster as he gently set down the 12-gauge over/under shotgun, recovered two spent plastic shotshell hulls, and then proceeded to retrieve three dead birds.

Of the 16 who observed the shooting, only a couple were in position to see the third bird fall and many never saw the second dove, spurring a barrage of questions for Roster on how to record a complex series of events that lasted mere seconds.

About the only things missing

About the only things missing were a grassy knoll and grainy black-and-white video.

For four long, grueling days in the heat, the group of observers — trained wildlife biologists and seasoned dove hunters — practiced the science of observation, data collection and reporting.

"You cannot report what you did not see!" reiterated Roster, a leading authority on shotgun ammunition efficiency and wounding loss in game bird hunting. He has been researching shotshell efficiency since the early '70s, when lead pellets for hunting waterfowl first came under scrutiny. Now, Roster is working with the Texas Parks and Wildlife Department on a study investigating the comparable effectiveness of lead and non-lead shot for doves.

Roster knows from experience that the science will be challenged, either by peers or in court, so the study protocols must be ironclad and the procedures consistent and accurate.

Passing Roster's training means you are proficient at following multiple targets no bigger than your hand flying erratically at speeds up to 40 mph. You can calculate within a matter of feet

the distance from a shooter to these targets, determine based on the bird's reaction to the shot whether or not it had been struck, and then track its flight path to conclude with certainty if it was wounded and flew off or died.

The data collection and reporting components would frustrate a court stenographer: recording the shooter's recollection of the event, tagging and storing each recovered bird for necropsy, and entering all these pieces of information on a form before the shooter can take aim again.

Before the study is finished, these processes will have been repeated thousands of times; all over something the size of a pin head, and so common that its use has been ongoing for thousands of years.

The use of lead and its impacts on the environment have



With more than a quarter of a million dove hunters taking to the field each fall, the results of the TPWD study on whether to discontinue use of lead shot will have a huge impact. The effects may reach beyond doves to upland game birds.

been a fulcrum for debate since dangerous emissions from lead smelting by Romans were documented in 300 BC. Lead's impact on human health is undeniable, and its use is banned for hunting waterfowl to protect ducks that mistake spent lead shot pellets deposited in marshland as food. Concern over the use of lead shot for upland game bird hunting is growing, and it is conceivable that non-lead shot requirements could be placed on dove hunters in the future.

This would have a huge impact on Texas, which owns the nation's largest mourning dove population (at an estimated 20 million birds) as well as a rich hunting tradition that sees about 300,000 hunters take to the field each fall. Texas hunters harvest about 6.4 million doves annually, roughly 30 percent of all doves taken nationally. With such an enormous stake in doves, it makes sense that Texas would take the lead in dove conservation.

"We already know lead is an environmental contaminant and has been shown to cause poisoning in more than 50 bird species other than waterfowl, including dove, but we do not know the extent of its impact," said Vernon Bevill, TPWD small game and habitat assessment program director.

To address this concern, TPWD is conducting a study to determine the killing ability and wounding rates of lead ver-

sus non-lead shot on dove under real Texas hunting conditions. The research is the first of its kind ever for doves, and the results are anticipated for use in decision-making on an international level. The study has support from many organizations, including the Central Flyway Council, the Association of Fish and Wildlife Agencies and the Wildlife Management Institute.

"Wildlife agencies worldwide are awaiting the results of the Texas dove lethality study," Roster said. "[Other] states, which permit dove hunting, are direct stakeholders in the results. Other nations that hunt small birds, such as the United Kingdom, cannot afford to nor would they ever be permitted because of anti-hunter resistance, related politics and relatively small hunter numbers to conduct such extensive research on their own. Thus, the results found in the Texas dove lethality study will help those agencies and those organizations worldwide wishing to perpetuate certain forms

of bird hunting to continue to run and defend legal hunts for such bird species."

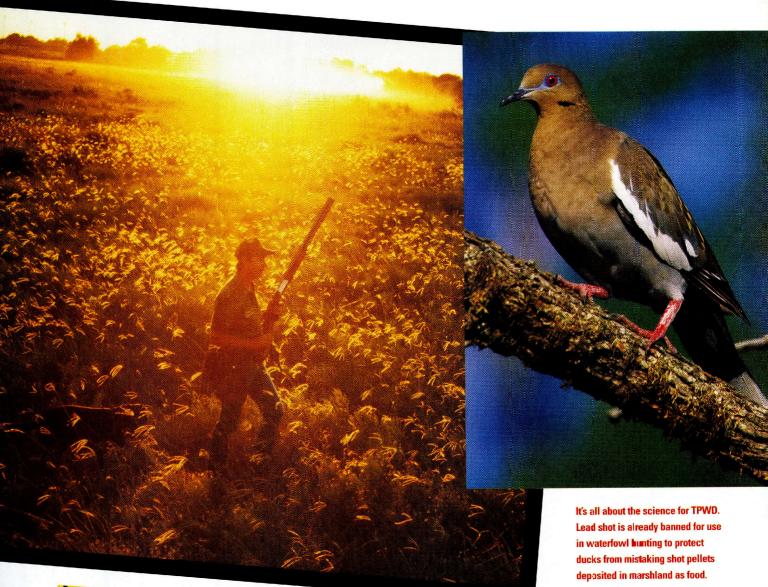
Since non-lead shot has proven effective for killing ducks and geese, common sense says it should be just as good or better on a much smaller quarry. According to Roster, in the case of shotgun loads, one size does not fit all.

"One thing I have clearly learned in my shotshell efficiency research is that performance parameters learned for one body size do not necessarily apply to other body sizes," he explained. "Worldwide there are no available data or information on shotshell efficiency performance for taking doves. The world has nothing other than theories, opinions and unsubstantiated assumptions about what shotshell loads would be most efficient. By conducting this research, Texas will be the world leader in answers to shotshell efficiency and lethality questions concerning doves.

"Neither I nor Texas Parks and Wildlife, I presume, have any







It makes sense that Texas would take the lead in dove conservation.

vested interest in whether hunters use lead or nontoxic shot-shell loads for hunting doves," said Roster. "If however, the forces that be wish to prevent the hunting of doves in Texas in the future if lead shot loads continue to be allowed, the results of the Texas dove lethality study will allow Texas to know—scientifically and with a high degree of statistical confidence—whether there is any other affordable nontoxic shot type for which there is any proven lethality for taking doves."

Steve Williams, president of the Wildlife Management Institute, believes this study is imperative. "My contention is there are groups pushing the lead issue with very little science to rely upon, and not just with doves, but also raptors and in fishing tackle. The study Texas is putting together is the most comprehensive effort to date and will provide science that decision makers can use to determine the impact lead has on dove populations."

Understanding the human dimension in the equation is significant as the debate over lead usage for hunting plays out. That is why the department is assessing hunter attitudes and knowledge about lead poisoning and non-lead shot. TPWD contract-

ed with D.J. Case and Associates to survey randomly selected dove hunters. The findings of the survey will help the department identify issues and address concerns among the dove hunting community and the general public in the debate over lead.

Some of the initial findings from the survey aren't surprising, but do indicate a need for education and communication with this important constituency during any decision-making process regarding use of lead and non-lead shot for doves.

Dove hunters surveyed expressed initial opposition to any change away from lead shot, but by the same percentages indicated a lack of knowledge about health concerns about lead shot and doves.

Historically, hunters have championed wildlife conservation even if it meant greater restriction on their ability to hunt. According to survey findings, by nearly a four-to-one ratio, hunters believe that if a scientific argument can be made identifying wildlife health risks from lead on doves, then TPWD has a responsibility to take action to conserve the resource. Furthermore, nearly three-fourths of the hunters surveyed said that they would learn how to better shoot non-lead if that argument was made.

If debates over restrictions on lead for dove hunting are on the horizon. Texas will have the ammunition it needs. **

COOLSCHOOL Dive into the wet world of fish!

» SUPER SWIMMERS

EVER WISHED YOU WERE A FISH? Well, you'd look silly with fins, scales and gills, right? But those three main body parts enable fish to swim and survive under water. Fish are also cold blooded, which means their body temperature changes with the surrounding water. Freshwater fish live in rivers, creeks and lakes. Saltwater fish live only in the ocean. Fish can be as small as tiny minnows in a stream or gigantic, like blue marlins in the gulf. What kind of fish would you like to be?

Sailfish

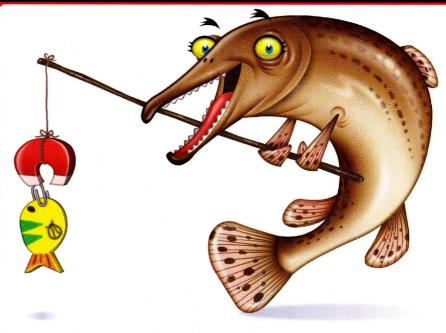
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>> WILD ART

YOU'LL NEED SOME CRAFT FOAM or stiff cardboard. Draw a simple fish outline on the foam. Decorate or color your fish. Cut it out, then attach a paper clip near its mouth. Find a magnet and tie a long string around it. Attach the string to a pole or a ruler. Now go fishing! Make lots of fish in different sizes and colors. Find a book on fish and draw outlines that look like a channel catfish, longnose gar or some other Texas fish.







» KEEPING IT WILD

WHAT DO YOU DO when you see trash on the ground? If you don't pick it up, that soda can or candy wrapper could eventually get washed into a river or onto a beach. Trash dirties the water, which can hurt fish and other aquatic animals. Do you live near water? Why not invite some friends to help you clean up a riverbank or part of a beach? (Be sure to ask an adult to come along as well.) If you live in a city, pick up trash in your neighborhood. Explain to your friends why fish need clean places to live, too.



>> WILD MATH



MOST FISH REPRODUCE BY "SPAWNING." A female lays hundreds or thousands of eggs, then a male comes by and fertilizes them. A female Guadalupe bass deposits 9,000 eggs. After chasing her off, the male guards the nest. That sounds like a lot of eggs, right? But some minnows sneak up and eat 3,679 eggs. Then two catfish come along and snatch 2,534 more. The "fry" (baby fish) hatch, but bigger fish swallow up 2,707 during the first week. How many survived? Why do you think fish lay so many eggs?

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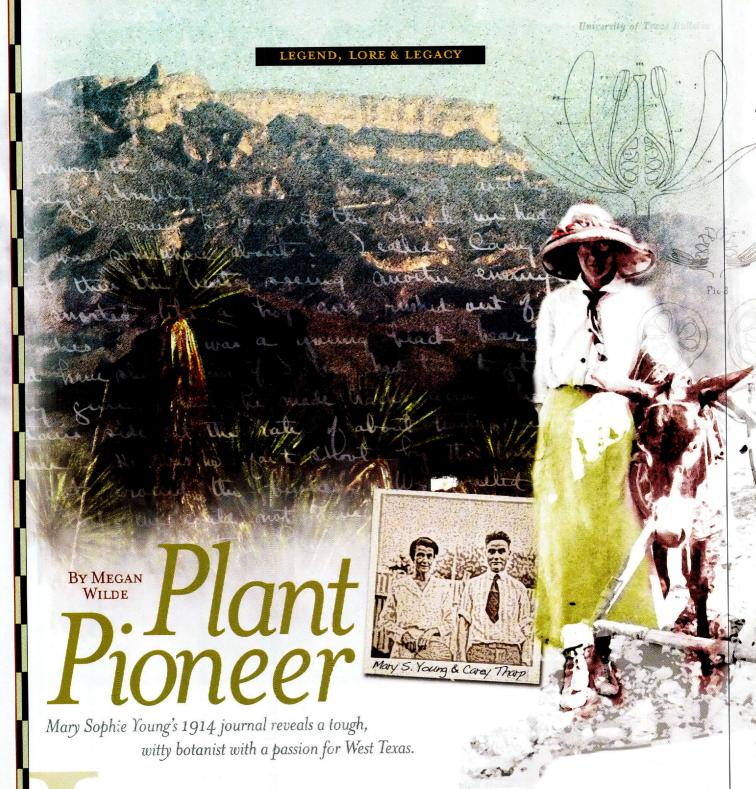


We hope you have enjoyed our new educational feature "Keep Texas Wild" and found it to be useful in your classroom or home. Unfortunately, our grant from ExxonMobil expired with the August issue, so we won't be able to send free issues to fourth-grade classrooms and other learning centers throughout Texas until another sponsorship is obtained. Keep Texas Wild — with its engaging photography and illustrations, fun-filled nature lessons and cross-curriculum activities is now a permanent feature of Texas Parks & Wildlife magazine.

If you would like to receive a magazine subscription for educational use, we offer a deeply discounted educators' price of \$9.95 for 12 issues. That's 75% off the cover price. Or buy additional copies of any issue for the classroom for only \$1 per copy (plus shipping). Of course, you can access the Keep Texas Wild downloadable PDF free each month through our Web site:

Randy Brudnicki

www.tpwmagazine.com.



In August and September of 1914 — before Texan women could vote and highways tamed statewide travel — Mary Sophie Young wore out her shoes exploring the rugged Trans-Pecos. Accompanied by a college student and a pair of ornery pack burros, this plucky botanist trekked about 100 miles across the Marfa grasslands, through the Davis Mountains, around the Sierra Vieja, along the Ric Grande and into the Chinati Mountains.

She learned about much more than the region's vegetation: "the characteristics of burros, how to treat wounds when they have worms in them, that hogs always have liver worms how to cook frijoles, what jack rabbit tastes like," she wrote in her field journal, which was published in 1962 in the Southwestern Historical Quarterly and is archived at the University of Texas at Austin.

Born in September 1872 in Ohio, Young came to Austin in 1910 as a UT botany instructor. She later took charge of and greatly expanded the university's nascent plant collection. She was the sort of gentle, generous professor who took needy students and stray animals into her home.

Though described by others as shy and frail-looking, she was a robust outdoorswoman, a trait she attributed to keeping up with several older brothers on childhood tramps. Being an unmarried woman with limited means never deterred her from far-flung fieldwork. With a .25-caliber Colt tucked in her long skirt's pocket, she traipsed around the state, gathering thousands of plant specimens and completing two pioneering studies of Austin-area flora. But the vegetation of far West Texas, then a

botanical frontier, particularly fascinated Young. Her journal from the 1914 trip — her first major expedition there — paints an amusing and endearing portrait of a turn-of-the-century woman naturalist afield.

Between botanical notes, she chronicled nights spent among flowering willows by a stream and on the starlit open range, where passing cattle served as a morning alarm. Other nights she and her I7-year-old assistant, Carey Tharp, shared a hay barn with cows, a rock pile with an inquisitive skunk and an abandoned ranch house with raucous rats.

"Carey shot holes in the roof after we went to bed trying to scare away a rat," she wrote, "but there are no signs that there are any holes in the rat."

She described daytime encounters with wilder critters, such as a squeaking coterie of prairie dogs outside Valentine and a nightmarish plague of caterpillars near Candelaria. A black bear and a rattlesnake startled her on Mount Livermore — the Davis Mountain's highest peak. She pegged the snake with rocks and severed its tail as a trophy, which, she noted, "when cut off entirely, asserted its independence by waving the rattles defiantly in the air."

The animals that figured most prominently in her journal, though, were her pack burros, Nebuchadnezzar and Balaam. When they weren't running away, the donkeys were perpetually prone to stopping, eating, laying down and sleeping.

"If our Lord rode as lazy a beast as this one, the triumphal entry into Jerusalem must have taken a long, long time," she wrote. After her attempt to ride Nebuchadnezzar deteriorated into a wrestling match, she declared: "Burros are a sore temptation to wrath."

As frustrating as the beasts could be, she kept her sense of humor about them. "Burros are interesting personalities," she observed after trying to put a pack on Balaam, whose shoulder was scratched. "They are like the fascinatingly mysterious heroines in the story books. When our two darlings were nearly ready, Balaam suddenly, but with deliberate intent, fell over on her side. We thought she had a giddy spell caused by her wound — (though she did not look faint) but when Nebuchadnezzar, seeing her, deliberately followed her example, we decided differently."

Food troubles were her greatest source of vexation. Packrats raided their hardtack, and a herd of rascally horses ravaged their butter

supply in the night. She ate weevil-flavored beans, cooked with worm-ridden corn meal and brewed coffee with cattle-tank water. After a few weeks in the field, she pined for a grocery store.

"This sounds like the diary of someone on an arctic expedition. The interesting item each day is how much food there is left," she wrote. "I was hard up the first part of the summer, but did not expect to live on famine rations in August. We suggest boiled boots, rats and other famine delicacies. It is a shame we can't go down in the canyon and eat grass like the burros. If the real old Nebuchadnezzar did it, why cannot we?"

With ever-dwindling supplies, she and Tharp supplemented their diet with cottontails, one "tough old grandmother" of a squirrel and even a jackrabbit. "It is good exercise to eat jack rabbit — gives

you an appetite. Jack rabbit should always be served with toothpicks. Jack rabbit is economical, one piece two inches in diameter and half an inch thick will last an average man all day if he chews constantly and his jaws stand the strain. Jack rabbit meat would make good sole leather."

Throughout her notes on food frustrations and animal antics, the landscape looms large. Her prose depicts rolling grasslands soaked green by summer thunderstorms and dotted with friendly mules and slick, fat cows. The Davis Mountains evoked her most vivid descriptions. "There was space: wide, brown, hazy, spotted with the shadows of the clouds," she wrote of the view from Livermore. "The plain lay before us, stretching out miles and miles to the mountains, which like gray clouds skirted the horizon."

Back at camp one evening, she described the "lonely time" in a dusk-embossed mountain canyon. "The air is very transparent and very still and everything glistens. There is something of that uncanny feeling of the consciousness of inanimate things."

Such mountain vistas stirred deep sentiment in Young: "Now and then there is an outcrop of white rock which looks at a distance like a group of white houses. All the time you know they are not houses. Through the gleaming, clear air, they give the impression of a mirage and the feeling they give one is an uncanny one of intense loneliness. The yuccas have the same effect in a rather less degree. They stand up stiff and straight like men, on the hills against the sky. The sight of cattle affects me sometimes the same way. It is the suggestion of human life with the conviction of its absence."

Young returned to the mountains of West Texas a few more times before her life was cut short. In February 1919, an operation revealed she had an advanced, untreatable cancer. She died in March, at age 46, in Austin.

It was B.C. Tharp, Carey's older brother and Young's successor at the UT herbarium, who later published her journal. In his introduction Tharp recalled that Young, leading up to her death, never complained about pain or the severity of her illness. Among the friends she left behind was a rescued mutt, named Santa Claus for his unruly love of stockings. After Young's death, Santa Claus made daily expeditions from her home to her laboratory, whining as he searched for his bold, beloved companion.

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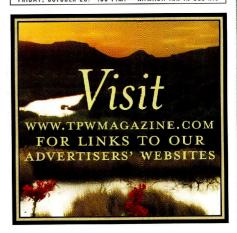
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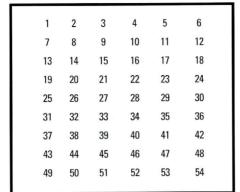


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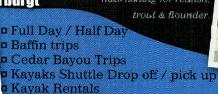
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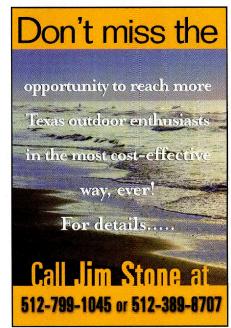
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Many of the men in the Texas army were from Columbus and may have even watched as the town was put to the torch when Houston and his men withdrew to the east. The town was quickly rebuilt afterwards, and today it can claim to be the oldest Anglo-American settlement in Texas.

History abounds here. Columbus and the surrounding area is where Stephen F. Austin brought his original 300 settlers. The town is dotted with historical markers and sites that spell out much of the story of Texas, from its earliest days right into the present era.

A talking house tour (you can park near the house and tune to a designated radio frequency) takes you from the most primitive of log cabins to grand mansions, and many fascinating homes between those extremes. The charming Magnolia Oaks Bed and Breakfast provides an opportunity to actually spend the night in a well-restored, 19th-century Victorian home.

While Columbus has exceptional depth and variety for a community of its size, it has also managed to hang onto that Mayberry quality. It is friendly even by Texas standards. The best possible way to see it is also the simplest — on foot. The streets are quiet and uncrowded, the atmosphere peaceful to the point of being spiritual. Opie might be just around the corner, headed for the river.

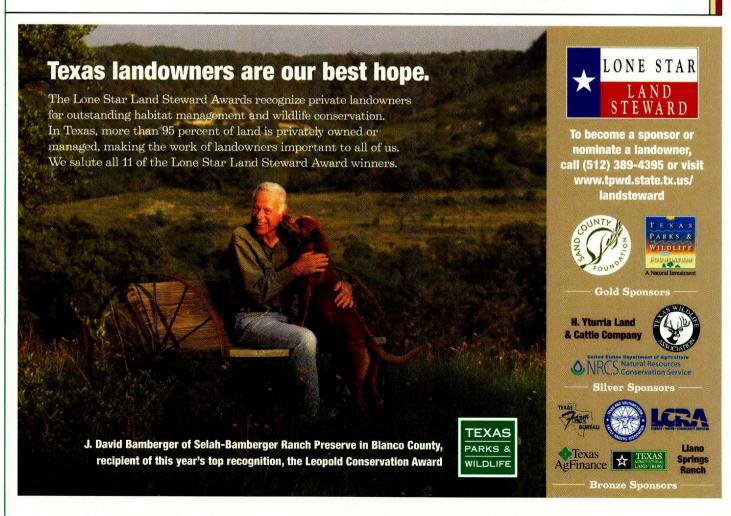
Columbus is fun and interesting, but don't ignore the surrounding area. A few miles to the southeast of Columbus, at the Attwater Prairie Chicken National Wildlife Refuge, you can watch prairie chickens put on a courting display worthy of

the male lead in high Italian opera. During mating season, the colorful male prairie chicken puffs up, struts and "booms" for hours to get the ladies into the right mood. Unfortunately, be-cause of habitat loss and predators, the numbers of these once abundant birds are now down to about IOO in the wild. If you want to see them perform their courtship displays, you have to go in the spring on a guided tour.

For sheer number of birds, a grander spectacle is the arrival of hundreds of thousands of geese and ducks in the fall around Eagle Lake (a self-described "goose hunting capital") just south of Columbus. The geese come to fatten up on the leftovers of the rice harvest after their long flight from Canada. The fields for miles around Eagle Lake can be filled with foraging geese and ducks during the winter. And following the birds come the bird hunters, also in large numbers.

"The bird hunting around here is usually fantastic during the winter. Although it varies from year to year, we've always got good opportunities," said Tim Kelly, owner of Eagle Lake Lodge. "We lease thousands of acres of rice fields around the area for hunting."

Rice is a water-hungry crop and could not be grown in such huge quantity without adequate water from the Colorado River. And without the rice, there would be far fewer geese to hunt around Eagle Lake in winter. Thus the river links almost every aspect of life around Columbus, from its history to its economy, to its charming ambiance and, of course, its great paddling trips.



PARTINGSHOT

Jesse Cancelmo photographed this scrawled filefish at Stetson Bank, a siltstone reef 30 miles northwest of the West Flower Garden Bank in the Gulf of Mexico. The odd facial characteristics and shape are features of the boxfish family of fish.

IMAGE SPECS:

Nikon 200 camera, Aquatica underwater housing, 60mm Nikkor lens, two lkelite strobes, ISO 100, f/16 at 1/125 second.





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