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# TEXAS

PARKS & WILDLIFE

The OUTDOOR MAGAZINE of TEXAS

## The State of Lakes

WHY LAKES MATTER

by LARRY MCKINNEY

FISH OUT OF WATER

by LARRY D. HODGE

WATER OR WOODS?

by HENRY CHAPPELL

DAMS ON THE SIDE

by WENDEE HOLT CAMP

WHITE ROCK'S SECOND CHANCE

by JOHN H. OSTDICK

SUNKEN CITY

by E. DAN KLEPPER

THE INVISIBLE LAKE

by BARBARA RODRIGUEZ

LAKE LIFE

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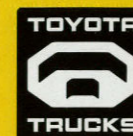
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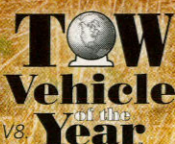


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2007 Trailer Boats' Tow Vehicle of the Year. Trailer Boats tested five 1/2-ton pickups head-to-head, evaluating both towing and non-towing performance. When the dust finally settled, the judges awarded the Trailer Boats' Tow Vehicle of the Year honors to the Toyota Tundra Double Cab SR5 4x4, powered by the 5.7L i-FORCE V8.



<sup>1</sup>4x2 Regular Cab Long Bed with 5.7L V8 when properly equipped.  
<sup>2</sup>Before towing, confirm your vehicle and trailer are compatible, hooked up and loaded properly and that you have any necessary additional equipment. Do not exceed any Weight Ratings and follow all instructions in your Owner's Manual. The maximum you can tow depends on the total weight of any cargo, occupants and available equipment. Vehicle shown with available equipment. ©2007 Toyota Motor Sales, U.S.A., Inc.

# Features

## 32 Fish Out of Water

By *Larry D. Hodge*

With all the competition for water among humans, who's looking out for the fish?

## 40 The Invisible Lake

By *Barbara Rodriguez*

The mystery, history and strange allure of Caddo Lake.

## 50 White Rock's Second Chance

By *John H. Ostdick*

An expensive dredging project saved Dallas' popular oasis, but only improved watershed management can prevent it from filling up with silt again.

## 58 Sunken City

By *E. Dan Klepper*

When Lake Falcon's water level drops, ghost towns emerge from the depths.

## 66 Dams on the Side

By *Wendee Holtzamp*

Off-channel reservoirs can help meet water needs while causing less environmental impact than dams that halt a river's flow.

## 72 Water or Woods?

By *Henry Chappell*

The proposed Marvin Nichols Reservoir would submerge hardwood bottomland to provide water for the Dallas/Fort Worth area.

## 78 Lake Life

By *Carol Flake Chapman*

From big-bass mecca to houseboat heaven, each lake in Texas has a unique personality to call its own.

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# CONTENTS

J U L Y 2 0 0 7



# 22

COVER STORY

## *The* State *of* Lakes

*By Larry McKinney*

In the 1950s, more water demand meant more reservoirs — now it's a little more complicated

PHOTO © LANCE JARNELL

# Departments

**6** At Issue *By Robert L. Cook*

**8** Mail Call

Our readers share their ideas.

**12** Scout

The latest conservation news and events.

**12** CHAIN OF GRUB *By Dyanne Fry Cortez*

Brimming with tasty snacks such as water fleas, a healthy lake offers fish many dining options.

**16** TO BUILD A LAKE *By Tom Harvey*

A thumbnail sketch of the lengthy process involved in getting a new reservoir approved.

**18** SKILL BUILDER *By Eileen Mattei*

Catching raindrops: You can save money and conserve water simply by capturing the rain that rolls off your roof.

**88** Sights & Sounds

Check out the Texas Parks and Wildlife Department's television and radio schedule.

**90** Park Picks

Recommended stops along the road less traveled.

**96** Parting Shot *By Grady Allen*

## Covers

FRONT: Lake Livingston State Park. Photo © Lance Varnell.

BACK: Sailing on Lake Travis. Photo by Harry Seawall/TXD&T.

PREVIOUS SPREAD: B.A. Steinhagen Lake. Photo © Lance Varnell.

THIS PAGE: Mink. Photo © GaryKramer.net

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JULY 2007, VOL. 65, NO. 7

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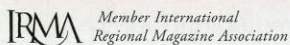


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# In the Field

## E. DAN KLEPPER

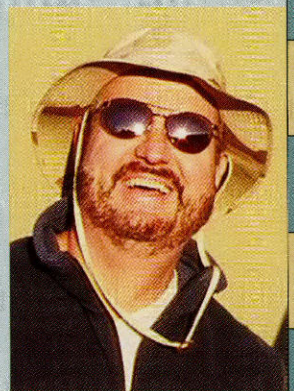
spends a considerable amount of time hauling a backpack across the Big Bend country. Occasionally he travels farther (and lighter) to other regions of the state. In this issue, he explores Lake Falcon, along the border in South



Texas, and the ruins of Guerrero Viejo in Mexico. A frequent contributor to *Texas Parks & Wildlife* magazine, Klepper writes articles, books and essays on the outdoors, adventure sports, cultural and natural history, and the arts. He also exhibits his art and photography at Klepper Gallery in Marathon. Klepper is currently writing and shooting a hiking guidebook, *100 Classic Hikes of Texas*.

## JOHN H. OSTDICK

says White Rock Lake in Dallas is able to take on many different personalities, depending on the light, weather, or crush of people hanging around it. The long-time Dallas writer has spent many hours biking and hiking White Rock's trails, lolling on a blanket on its shores or trying to help it recover from heavy use during monthly clean-up efforts. White Rock was suffering a slow death in the late 1990s before a major dredging project resuscitated it. "The lessons of White Rock offer insight into the life cycle of a lake, and the effects population growth, policy, politics, and local activism can have on lakes in Texas and across the nation," Ostdick explains.



## BARBARA RODRIGUEZ

has been writing about food, travel and style for 25 years, but she's been enjoying the lakes of Texas since she and her pet duck visited Possum Kingdom when she was 6. By the time she visited the lakes of East Texas for the first time, she was more into boys than fishing lures. That is, until her father wowed her with a day on the mysterious Caddo Lake. Webbed with Spanish moss and water hyacinth, it was worlds away from all she understood lakes to be. Last year she wowed her son with his first outing on Caddo Lake and found the lake every bit as intriguing as she remembered. In this month's story, she writes about Caddo Lake's history and mystery and concerns for its health.



# AT ISSUE

FROM THE PEN OF ROBERT L. COOK

**On Halloween eve, October 30, 1938, in the midst of the Great Depression,** millions of Americans searching for a distraction from their daily toils and troubles tuned in to a popular radio program featuring plays directed by and starring Orson Welles. That evening the play was an adaptation of the science-fiction novel *The War of the Worlds*, and although the broadcast included a number of announcements at the beginning and throughout the program that it was all a radio play, the program was performed so that it sounded like a news broadcast about an invasion from Mars! The actors cleverly played the roles of newscasters and elected officials frantically announcing that a huge flaming object had landed on a farm in New Jersey, and then that several large slithery aliens with long tentacles had emerged from the spacecraft and immediately begun the destruction of homes and buildings in the area. The program produced an immediate, and unfortunate, reaction of fear by listeners, especially in the northeastern states. It was later estimated that 2-3 million Americans literally panicked upon hearing of the alien invasion, packed their cars and hit the road in flight, hid in their cellars and basements, or barred their doors and loaded their guns to defend themselves against the beady-eyed aliens, who were, in fact, total fabrications by the skillful actors. It was a huge embarrassment to all, led to many profuse apologies by the radio company, and resulted in many inquiries by elected officials. It may have also contributed to the attitude of "Don't believe everything that you hear."

However, I wonder what it will take to overcome our complacency, to shock us into action when it comes to water — water for people, water for agriculture, water for industry, and water for fish and wildlife. Would the threat of a bunch of thirsty aliens who are going to pipe all of our water to Mars wake us up to the fact that we must do a far better job of using and conserving our freshwater supply? What if we heard that because of an extended drought that the water supply for one of our major cities had run out, and that until it rained there was no more water? And, of course, with such an extended drought millions of Texans who previously watered their St. Augustine grass would be simply out of luck until the next major flood event. What if that was the news tonight? What if it was not a play?

"Wait a minute," you say, "all we have to do when we want a drink of water is to turn on the faucet! That's where water comes from, right?" Most of us do not know and do not care where our water really comes from. We continue to act like it is somebody else's problem to solve, like maybe our children will solve it, but, surely, our grandchildren will solve it. I'm afraid that they will wonder about our "Who cares?" attitude. We continue to use and waste far too much water. We continue to demand that water be "too cheap." We continue to talk, and talk, and talk.

Texans are beginning to understand the urgency and critical importance of our water issues. Leadership is searching for solutions. Do we continue to allow one entity to drill dozens, maybe hundreds of water wells on one tract of land and pump an entire aquifer dry in order to sell the water to a distant city? Do we pipe water from the rivers and lakes of East Texas to the thirsty cities west of Interstate 35? Do we pump the rivers of Texas dry? Or, do we dramatically step up statewide water conservation efforts? Several of our elected officials have introduced legislation and tried to enact regulations and policies that might help, but because of our complacency they have not received widespread support.

Don't panic ... but please do get informed and involved. It is our problem. Let's solve it.



EXECUTIVE DIRECTOR

## *Texas Parks and Wildlife Department mission statement:*

**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.**

# The Angler's First Stop





# MAIL CALL

PICKS, PANS AND PROBES FROM OUR READERS

## FOREWORD

**Meet me at the lake. It's one of the happiest phrases** in the English language. It brings to mind lazy afternoons of swimming, fishing and dangling bare feet off a pier. It's amazing the effect that a large puddle of water has on people. On the water, the problems of the world seem less weighty and laughter comes easy. Lakes are meeting places, party places and places to find silence. One of my favorite ways to cap off a day at the lake is to watch the sunset over Lake Travis at the Oasis restaurant. As the sun blips out of view, the crowd always starts clapping. I'm not sure exactly what we're applauding, but it is a heck of a show.

It's easy to forget that recreation is a fringe benefit on most lakes — not the reason the reservoirs were built. Early on, many were built for hydroelectric power or flood control, but these days it's mostly about drinking water. The good news is that there are many ways to enhance a region's water supply. Turns out that's the bad news, too. The issues are mind-boggling in their complexity, and every faction has an expert ready to "explain" how to meet the state's water needs while protecting the environment.

In this issue, we've tried to sort out some of the key issues without getting up on a soap box or dumping reams of technical information on you. The most challenging aspect of pulling together this year's water issue (our sixth since July 2002) was the fact that most lakes in Texas are man-made. Whereas many of our earlier water issues have focused on restoring springs or saving wetlands, with lakes, there is no natural state we can return to. So we've focused more on the management challenges faced in our not-quite-natural land o'lakes.

Every time we do one of these special issues, I find my perspective changes a little. With the springs issue, I began to see vacant land not as wasted space or even simply green space — I began to see it as a giant sponge that cleans water and helps create cool, clear springs. After completing the wetlands issue, I could no longer drive by the seemingly empty marshes between Houston and Galveston without envisioning the vibrant life that thrives just out of view in shallow nurseries.

And now I see lakes with new eyes. On the surface, they're fairly easy to understand. Lakes are an integral part of Texas now, for water, recreation and myriad other purposes. The next time I'm on the water, though, I will be imagining what is on the bottom, what was there before. I'll try to envision the Texas that my great-great-grandfather, Martin Parmer, once roamed. He was a signer of the Texas Declaration of Independence, a member of a visionary group that boldly imagined — and created — a better future for what was then northern Mexico. It will take a similar kind of boldness to ensure that generations to come can continue to enjoy a dappled sunrise in East Texas or watch the sun set over a healthy, glistening lake — maybe they'll even applaud.

*Robert Macias*

ROBERT MACIAS  
EDITORIAL DIRECTOR

## LETTERS

### KEEP CAMPING NATURAL

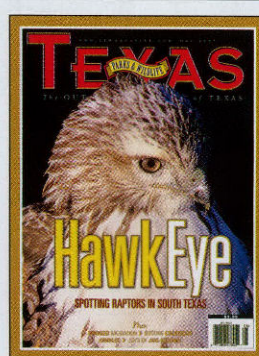
I want to teach my son the joys of the great outdoors, but sometimes this can be a little tough. We recently went on a camping trip. It started off great on Thursday. We got camp set

up, and my son and I took a bike ride through the park. Hills were a killer on old mom's legs, but it was a beautiful ride. I felt like we had the park to ourselves, as not many people were there on a Thursday. My son and I enjoyed hiking, eating lunch outdoors, and looking at the variety of bugs, mostly caterpillars and butterflies. My son was running around and having a great time. I want to teach my son the wonders of the great outdoors.

On Friday afternoon, it pained my heart to

see the newcomers arrive at the park. They brought campers. (What happened to good old tents?) They brought TVs. (This gave new meaning to "go outside and play.") They brought video games and loud radios. Of all the families I saw, half were not taking advantage of the beauty that surrounded them or the precious time they could be spending with their families.

Camping in a state park or a national park is the best time to talk and spend time with your loved ones. You don't need all the junk from home that keeps you separated from them. When you come to a park to go



Out of all the families I saw, half were not taking advantage of the beauty that surrounded them or the precious time they could be spending with their families.

Stephanie Moreno  
Fort Worth

## MAIL CALL

camping, all you need is your family, recreational gear and laughs! Go outdoors and spend quality time with your family. Take the time to teach children about the outdoors and how to conserve and take care of what we have. I am afraid that today's generation will lose the true meaning of camping or outdoor adventure.

When I go camping, I want my son to see other children spending time with their families — bike riding, fishing, running, hiking, canoeing. When my son goes hiking, I want him to see the beauty of nature, not trash. (Teach children to pick up trash or at least carry their own trash to the trash can.) I also want the speed limit signs to be followed. (There are children biking and running around the campsites without a care in the world — slow down. We drive the limit and it drives people crazy.)

Let's keep camping in the great outdoors natural and use it in the way it was intended.

STEPHANIE MORENO  
Fort Worth

### FISHING WITH DAD'S THE BEST

I enjoyed the recent article "Old School Catfishing" by Larry D. Hodge (May 2007). Some of the best times of my life have been spent fishing with my dad, other

### Sound off for "Mail Call!"

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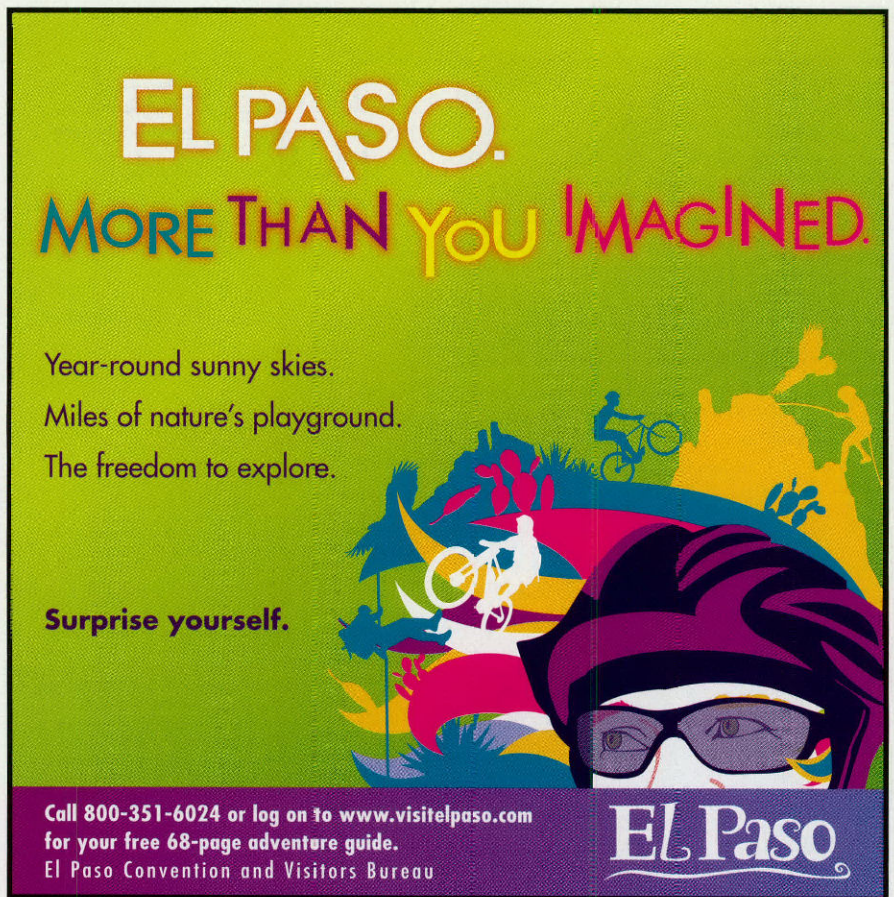
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## Conserving a Texas Treasure —The Guadalupe River...

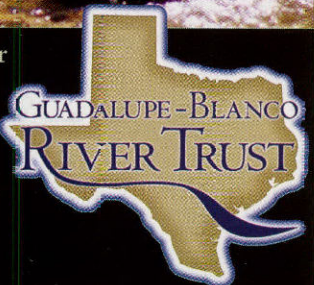


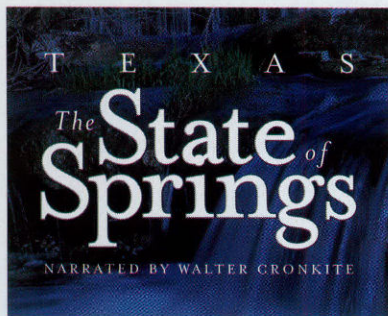
Photo by Lynn Mc Bride/The Nature Conservancy

The Trust helps people in the Guadalupe River watershed conserve their land and water.

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## A MUST-SEE FOR ALL TEXANS!

*Texas the State of Water*  
*Texas the State of Water—Finding a Balance*  
*Texas the State of Springs*

This series of breathtaking and informative documentaries on the most important conservation issue facing Texas—water—is now available for purchase on DVD. Two of these special shows were narrated by Walter Cronkite.

The most recent, *Texas the State of Springs*, has just been released. It focuses on the alarming decline of Texas' natural springs and what can be done to save them. Also included on the DVD are water-related excerpts from the award-winning Texas Parks and Wildlife television show.

To order a copy of this new DVD or the entire series, visit [www.tpwd.state.tx.us/business/shop/videos](http://www.tpwd.state.tx.us/business/shop/videos) or call (800) 792-1112, ext. 94637



relatives and friends. I have fond memories of catfishing on the banks of the Guadalupe River, although I wasn't an accomplished fisherman at the time. I took my youngest son, Brayden Scott, 3, fishing and he caught a catfish at our getaway place outside of Smithville.

Thanks for the magazine and the continued variety of articles along with the excellent pictures.

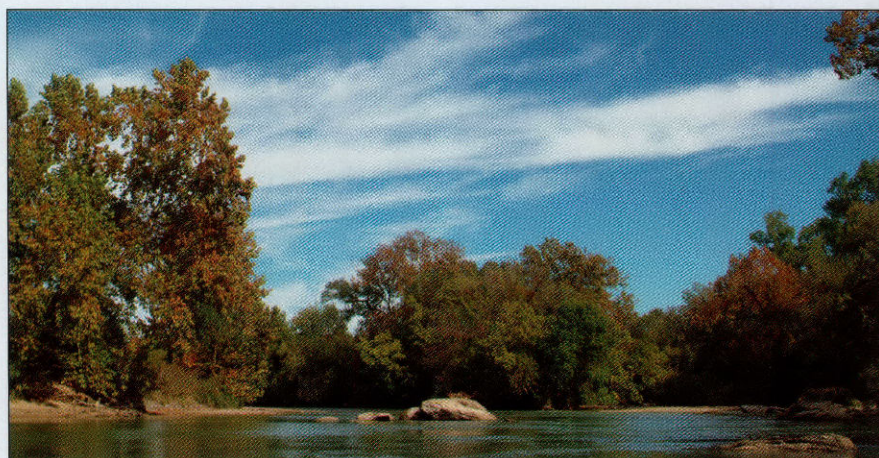
MARTIN CANO  
Cedar Park

### SHOULD WE HUNT ALLIGATORS?

In the May 2007 issue, I happened upon the American alligator article ("Saving Gator Babies"). I noticed that it mentioned "The American alligator is still included on the Department of the Interior's list of threatened species." Yet in my city of Brownsville (and I presume the rest of the state), the American alligator was this year made eligible for hunting and trapping. Why, after them making a "rebound" from the endangered species list, would the state then turn around and let people start hunting them? It sounds like they still need time to "rebound." I live on a resaca in North Brownsville. We have multiple American alligators living and nesting in our waters, and I think it would be a shame to have these nesting and breeding animals being hunted for no other reason than the state said we can do so. Thank you, and keep up the excellent work.

ORLANDO S.  
Brownsville

TPWD responds: According to TPWD wildlife biologist Jim Sutherlin, American alligators remain listed on the U.S. Department of the Interior's list of threatened and endangered species due to the fact that they are very similar in appearance to other crocodylians around the world. Many of the world's crocodiles are very much endangered. American alligators in Texas are a very good example of a wildlife species once endangered, but thriving today. The legal wild harvest of alligators in Texas was resumed in September of 1984 on a statewide basis on private lands. Alligators may only be harvested from public waters if they are being taken from adjacent private lands or if they have been determined by TPWD to be nuisance animals.



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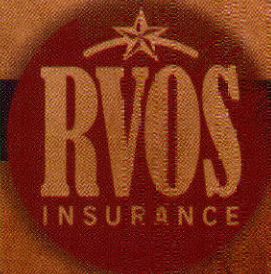
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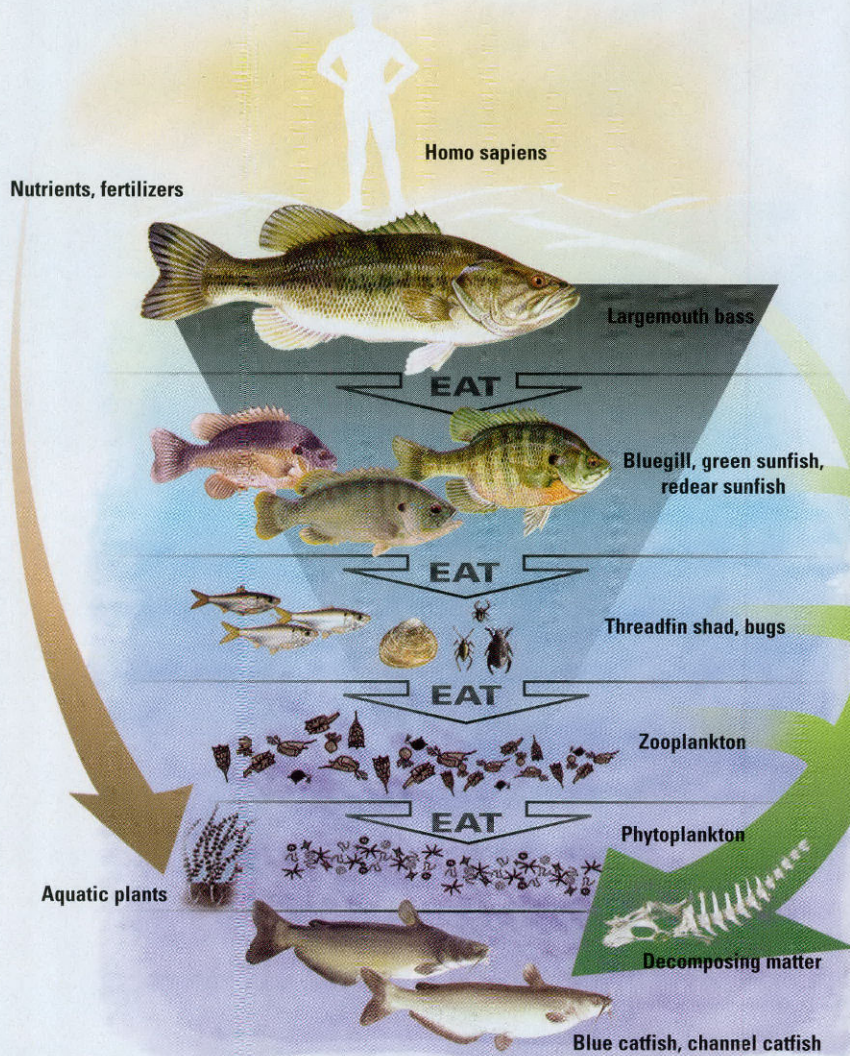
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# SCOUT

NEWS AND VIEWS IN THE TEXAS OUTDOORS

## CHAIN OF GRUB

*Brimming with tasty snacks such as water fleas, a healthy lake offers fish many dining options.*



**Lake food chain: Big fish eat smaller fish, which eat even smaller fish and bugs, which eat even smaller organisms and plants. Catfish serve as the great recycler, eating just about anything, dead or alive.**

**O.H. Ivie Reservoir is an oasis at the edge of arid West Texas, built where the Concho River turns north to join the Colorado. It holds 554,000 acre-feet at conservation pool level. In this decade, it has seldom been more than half full. Still, it's an impressive body of water, and a fine place to live if you happen to be an aquatic organism.**

In 2000 and 2002, anglers at O.H. Ivie donated five largemouth bass to the Budweiser ShareLunker Program. Each fish weighed over 13 pounds. The largest, a lake record caught by Butch Gayle, tipped the scales at 14.58.

Craig Bonds, a biologist in the Texas Parks and Wildlife Department's San Angelo fisheries office, figures those lunkers were roughly the same age as the lake. Built in 1990, O.H. Ivie filled to storage capacity in 1992. "It takes nine to 11 years on average to grow a fish to 13-plus pounds," says Bonds. "Those fish were young when the lake first filled and was full of nutrients."

When Bonds says "nutrients," he means fertilizer. New lakes are full of it. Rising waters flood land where grasses and trees once grew and animals left their droppings. This organic matter decomposes, releasing nitrogen, phosphorus and other elements that stimulate the growth of aquatic plants. Green plants are the first link in a lake's food chain, using chlorophyll to grab the sun's energy and store it in a form that other living things can use.

ILLUSTRATION BY BOGAN COOPER/TPWD

O.H. Ivie has stands of hydrilla and pondweed in the shallows. These rooted plants provide food for some organisms and protective cover for many others. However, most of the food production in a lake is done by phytoplankton — a catch-all term for single-celled algae and other free-floating plants too small for the human eye to see.

The next level is occupied by zooplankton, an assortment of microscopic animals that includes rotifers and water fleas. Zooplankton graze on phytoplankton “just like a bunch of cows in a pasture,” says Bonds.

Fat zooplankton taste fine to insect larvae and other small animals — including baby fish. Nearly every species of fish eats zooplankton at some stage of development. As young ones grow, dietary preferences diverge. Threadfin shad stick to a plankton diet for most of their lives. Bluegill favor insects and their larvae. Redear sunfish, also known as “shellcrackers,” have specialized pharyngeal teeth for crunching up snails and mussels. Young warmouth and green sunfish start with insects, but eventually move on to crayfish and small fish.

Sunfishes tend to congregate in the rooted vegetation. It's where their favorite foods hang out, and also a good place to hide from bigger fish that want to eat them. Largemouth bass cruise the same underwater jungles, seeking cover when they're small and hunting larger prey as they increase in size. White bass tend toward open water, feasting on schools of shad. Flathead and blue catfish eat whatever fish they can catch, and the omnivorous channel cat, “like the raccoon of the terrestrial world, will pretty much eat anything,” says Bonds. Adult gizzard shad and smallmouth buffalo are detritivores, consuming the leftover parts of dead plants and animals.

Several factors can change the balance of a food chain. A shortage of submerged vegetation means no nursery for sunfish and the invertebrates that feed them. Fingerlings that can't find cover may be wiped out before they have a chance to grow, which leads to food shortages farther up the line. Excess vegetation isn't good either: if prey fish have too many places to hide, predators go hungry. Bonds says the hydrilla at O.H. Ivie is approaching the nuisance stage, but so far, fluctuating lake levels have kept it under control.

Availability of nutrients is an important factor. It determines the carrying capacity, or how much life a lake can support. Older lakes are less fertile than new ones. Nutrients flow in with runoff from the surrounding watershed, but West Texas has lived through several years of drought. Descendants of O.H. Ivie's ShareLunker bass don't have it as easy as their great-grandparents did. There are more fish in the lake, competing for fewer resources. In 2001, TPWD changed the lake regulations to encourage thinning of the largemouth bass population. There's no minimum length limit; however, only two of the five-per-day bag limit can be under 18 inches.

One law of nature must always be observed: approximately 90 percent of the food energy is lost at each step of the chain. Only a few individuals will make it to the top.

Predator fish that survive to trophy size are kings and queens of their domain. They can go where they want, eat what they like, and nothing is big or mean enough to eat them — until some air-breathing biped fools one into biting on a hook, hoists it out of the lake and fries it up for lunch. ★

—Dyanne Fry Cortez

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## What's an estuary?



**"It's home,"  
says this marine biologist.**

"Home" is hardly the scientific term, but the Barataria Terrebonne Estuary, the Louisiana coastal area where the Mississippi River meets the Gulf of Mexico, is precisely that to countless wildlife species that thrive in the estuary's dynamic blend of fresh and salt water. It is also home to roughly 600,000 people, many of whom depend on the region's agricultural, fishing and petrochemical industries. As director of the Barataria Terrebonne National Estuary Program (BTNEP) and a fourth generation Louisianan, Kerry St. Pé is responsible for maintaining the delicate balance of the estuary ecosystem so the region can continue to sustain those who, like himself, call it home. At Shell, we're happy to help, because much of our family calls the estuary "home," too. Learn more by visiting [shell.com/us/kerry](http://shell.com/us/kerry)



Kerry St. Pé can trace his family's ties to the Barataria Terrebonne Estuary back to the mid-1700s when his ancestor Pierre Antoine St. Pé settled in the region. The estuary is part of Louisiana's coastal area where the Mississippi River meets the Gulf of Mexico, and while Kerry's long lineage in the region is impressive, it is not unique for that part of Louisiana. Families that settled near the Barataria Terrebonne Estuary have tended to stay despite hardship. Mother Nature recently dealt undue hardship when Hurricanes Katrina and Rita devastated the area.

As director of the Barataria Terrebonne National Estuary Program (B-TNEP), Kerry is challenged with staving off the continual loss of the estuary's wetlands. Even before the hurricanes, the task was daunting. Now, with more than 35 square miles of wetlands washed away in a matter of months by two of the most powerful hurricanes to hit the Gulf Coast in recent history, the task seems almost insurmountable.

Kerry, however, is staying on task. He continues to promote a strategy whereby riverbed sediment is transported from the bottom of the Mississippi and Atchafalaya Rivers through a new infrastructure of pipelines and deposited to the Louisiana wetlands to help restore the estuary's delicate ecosystem. After more than 30 years, Kerry remains committed to the estuary and its surrounding wetlands because Kerry understands, perhaps better than most, how much residents of the region want to stay, whether those residents happen to be people, birds, fish, or wildlife.

Shell is happy to help Kerry and others in their efforts to maintain the Barataria Terrebonne Estuary and restore the Louisiana wetlands. While our presence in the region doesn't date back to the 1700s, Shell has been working in and around the Barataria Terrebonne Estuary for sometime, and like the area's other residents, we want to stay.





# To Build a Lake

*A thumbnail sketch of the lengthy process involved in getting a new reservoir approved.*



Texas Commission on Environmental Quality, usually done prior to seeking other authorizations. TCEQ must evaluate the availability of remaining unappropriated water rights in the river basin to assure there is still water for the new reservoir. They must also evaluate the ecological impacts, especially to aquatic habitats, and especially for reservoirs larger than 5,000 acre-feet. TCEQ must also certify water quality and evaluate dam safety.

With your water rights permit in hand, you'll proceed to the U.S. Army Corps of Engineers, where you can plan to hunker down for many months of detailed review.

If the site is within or affects what the Corps considers "navigable waters of the U.S.," authorization under Section 9 of the federal Rivers and Harbors Act is required for construction of a dam or dike there. You'll also need a Section 404 permit under the federal Clean Water Act for "discharge of dredged or fill into waters of the U.S." for that part of the project that requires filling in streams and wetlands (basically the dam construction). The Corps usually addresses all these concerns in a single permit.

Structures that may impact the coastal management zone must be reviewed by the Coastal Coordination Council made up of state agencies, gubernatorial appointees and others. The federal National Environmental Policy Act requires identification and consideration of all impacts to the "human environment." The federal Fish and Wildlife Coordination Act requires consideration of, and mitigation for, impacts to fish and wildlife. Both are incorporated into Corps regulations. Other federal and state laws may apply as well.

The project sponsor (usually a city, river authority or water district) must characterize impacts to all "public interest factors" the Corps must evaluate. These include fish and wildlife and their habitats (all that will be impacted, not just those within the river and associated streams or wetlands), as well as water quality, eco-

**The process of siting, permitting, mitigating, financing and building a dam and reservoir is a complicated affair that can take many years.**

The first step involves the Texas regional water planning process, where planners quantify future water needs and consider the menu of "water management strategies" for meeting them. Sixteen regional water planning groups representing river basin stakeholders across the state must first consider and recommend reservoir sites. Their regional recommendations then roll up into the state water plan, which is updated every five years, most recently in late 2006.

The next step is to secure legal rights to use the water you plan to impound. This means getting a water rights permit from the

gible waters of the U.S.," authorization under Section 9 of the federal Rivers and Harbors Act is required for construction of a dam or dike there. You'll also need a Section 404 permit under the federal Clean Water Act for "discharge of dredged or fill into waters of the U.S." for that part of the project that requires filling in streams and wetlands (basically the dam construction). The Corps usually addresses all these concerns in a single permit.

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nomics, flood control, cultural resources, aesthetics, safety, agriculture and numerous other factors.

Under what is known as the Section 404(b)(1) Guidelines, the Corps may only issue a permit for the least environmentally damaging practicable alternative. The project must also comply with other technical elements of the guidelines, including no significant degradation of waters of the country and inclusion of all appropriate and practicable mitigation.

Mitigation is defined by the U.S. Environmental Protection Agency as a sequential process involving, in order: (1) "avoidance" of unnecessary impacts, (2) "minimization" of impacts not essential to accomplishing the project, and (3) "compensatory mitigation" to replace unavoidable and non-restorable adverse impacts to fish and wildlife and their habitats.

Compensatory mitigation typically involves acquiring, restoring and/or enhancing and managing other land so that its natural ecological functions are enough to replace the lost functions and values of the impacted reservoir site. This often requires acquiring larger areas than the impacted site and practicing restoration, enhancement and/or management so that ultimate conditions are better at the mitigation site than before management began there. Only the difference between the unmanaged condition and the managed condition can be credited as "compensatory mitigation."

Corps review for larger projects, such as reservoirs, requires public notice to those who request to be on the review list. This includes review by federal and state resource agencies, whose comments carry significant weight in the permitting process, especially for water quality and fish and wildlife habitat values and mitigation needs.

Successful applicants who receive the Corps' blessing have one more permit stop to make: Texas Parks and Wildlife Department. No one is allowed "to disturb or take streambed materials" from Texas freshwater areas under TPW Commission control without a "sand and gravel permit." The commission must find that the permit will not significantly adversely affect fish or wildlife, navigation or recreation. Most of these issues are worked out in the lengthy process of obtaining the other permits, so this

permit is usually processed relatively quickly, and is typically the last obtained.

While wrapping up the red tape, you have hopefully attended to financing, because you'll need plenty. The proposed Applewhite Reservoir (which was approved for construction but defeated by San Antonio voters), was projected to cost about \$300 million 15 years ago. The Texas Water Development Board has said Texas needs to spend \$30.7 billion to implement water management strategies (including new reservoirs, plus other projects) to meet state water needs through 2060.

At last, you're ready to bring in the bulldozers — if the weather cooperates. ★

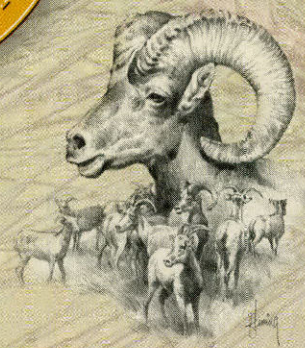
— Tom Harvey

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# Catching Raindrops

*You can save money and conserve water simply by capturing the rain that rolls off your roof.*



**Rain barrels and cisterns** are no longer merely nostalgia-inducing curiosities. As demand for Texas water surges, straining reservoirs, draining aquifers and reducing flowing springs, water conservation has become a vital issue.

Effective rainwater capture systems called guzzlers have been used for years at Black Gap and Elephant Mountain Wildlife Management Areas, for example, to support wildlife. Now, capturing rainwater for home garden and wildlife use is gaining more practitioners thanks, in part, to TAMU Cooperative Extension agents who are promoting rainwater use.

Rainwater harvesting involves catching, storing and distributing rainwater to use for wildlife and landscaping. Storm runoff — the rain sheeting off your roof and driveway heading for storm sewers — is an asset you can capture and use. In the process, you help reduce flooding and stream erosion.

"We are stewards of that raindrop wherever it lands. If we don't capture it, it goes downstream," says Menard County agent Billy Kniffen, a leading rainwater harvesting advocate. Because landscape irrigation grabs 30 to 50 percent of urban water usage, harvesting rainwater reduces both the pressure on a limited resource and your water bill. He points out that Santa Fe, New Mexico, now requires houses larger than 2,500 square feet to install a rainwater collection system.

To begin rainwater harvesting, look at the slope of your land and how water drains off it, the plant and soil types, and your catchment area, which usually means your roof, although it could be a driveway or tin panels as well. One inch of rain on 1,000 square feet of roof yields about 600 gallons of high quality water, which adds up in a hurry. (A house's square footage roughly equals its roof size.) Existing gutters and downspouts help channel water to containers.

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If your soil is sandy or caliche, rain dripping from the roof or flowing out a downspout can water a small landscape area enclosed by a shallow berm. Otherwise, to prevent damage to your foundation, rainwater can either be captured in containers or channeled through a ditch or by downspout extensions to a holding area or a rain garden at least 10 feet from the house. A rain garden is a level but slightly depressed area edged by a 5-to-8-inch-high berm that holds rainwater for less than 24 hours while it slowly infiltrates the ground. It is usually rimmed with native plants.

To make a small-scale, simple rain barrel, start with a new 32-gallon plastic garbage can with a lid.

1. Use a 3/4-inch hole saw to cut a hole about 4 inches above the bottom of the can.

2. Insert a half-inch plastic or metal faucet backed with a flat washer and a rubber washer.

3. Secure the faucet from the inside with a rubber washer, a flat washer and then a 1/2-inch PVC threaded coupling (or metal washer and thin nut).

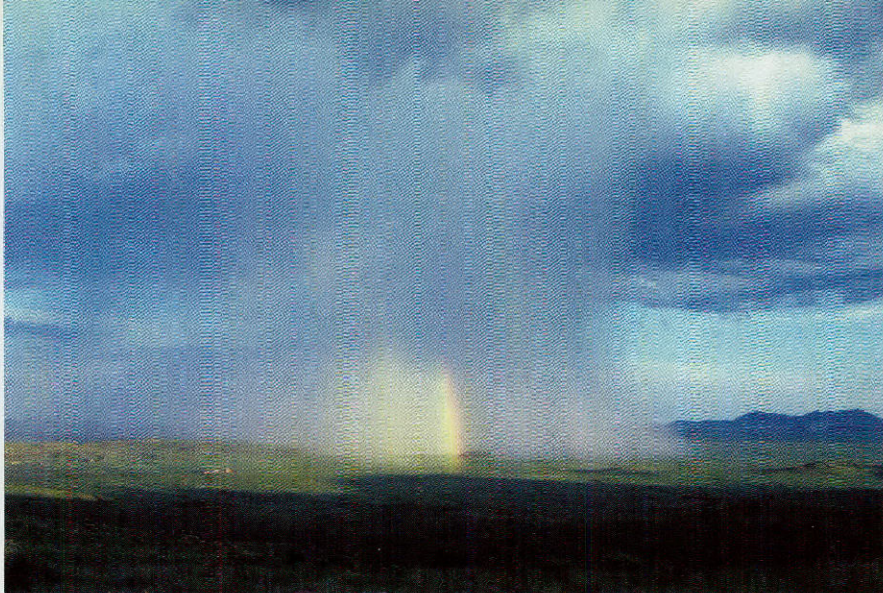
4. On the lid, cut out a 4-inch by 4-inch opening.

5. Use silicone caulk to attach a 5-inch by 5-inch piece of fine mesh nylon screening from the inside. The screen keeps debris and mosquitoes out.

6. Cut 2-inch hole for overflow near the top and attach the nylon screening.

Position the screen of the barrel beneath the junction of two eaves of a gutterless roof, at a gutter end or under a shortened downspout. You can connect several barrels together at their overflow pipes. Attach a hose to the faucet and run it to a landscaped area or, with a drip emitter attached, to a pet or wildlife watering pan.

Texas Master Gardeners and Master Naturalists present rainwater harvesting workshops on simple and complex systems with precise tables for determining your needs and options. For more information, visit <rainwaterharvesting.tamu.edu> or <www.twdb.state.tx.us>. ★



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THE  
STATE  
OF  
LAKES

PHOTO © LANCE VARNELL

*Lake Conroe*

By Larry McKinney

THE  
STATE OF  
LAKES

IN THE 1950S, MORE WATER DEMAND MEANT MORE  
RESERVOIRS — NOW IT'S A LITTLE MORE COMPLICATED.



A satellite view of Texas today looks significantly different from the Texas of the early 1950s. Yes, the roads, cities and other engineered infrastructure of the state have exploded along with the population but the single most striking difference today is the color blue. That expanded color and various shades toward green come from another engineering feat: the construction of reservoirs. Texas, once devoid of all but one or two “natural lakes,” now has enough reservoirs to cover more than 5,056 square miles (3,235,840 acres). In Minnesota, the land of 10,000 lakes, water covers some 4,783 square miles (3,061,120 acres). The 2007 water plan for Texas proposes the construction of 16 new reservoirs covering an additional 246 square miles (157,208 acres). Minnesota, eat our dust!

These numbers represent not only big reservoirs, but also small lakes, ponds and stock tanks. Thanks to an aggressive soil conservation program, an acute awareness of drought, and individual landowners who build their own lakes, we probably have far more than Minnesota’s 10,000 lakes — sorry Minnesota, second place again. Anyone who has flown over Texas in early morning or late afternoon and looked out across the horizon toward the sun knows what I mean. The whole landscape can glitter with water. It is a startling realization if you have never seen it — an engineering feat worthy of Texas.

All of this reservoir building has helped insulate Texans from periodic droughts. The disastrous drought in the early 1950s was the driving force behind the explosion of reservoir construction. Other positive benefits are the recreational opportunities and economic growth these reservoirs have created. Texas did not start off with a nationally recognized big bass fishery — it created one. Reservoirs, and the freshwater fisheries they contain, serve as the foundation for a multibillion-dollar fishing industry in the state. Fishing, boating, skiing and water-related recreation are big business here, and some of the most expensive and desirable real estate in Texas is lakefront property. Many of the state’s busiest parks are located on these reservoirs. As an economic engine for the state of Texas, the development of water resources is an unparalleled success. The question is, are we smart enough to know when we have too much of a good thing?

This is an important question for all

Texans, as we are at a crossroads similar to the one we faced following the drought of the ‘50s. Our population grew from 8 million in 1950 to 21 million in 2000. Our water supplies basically kept pace, and the means of doing so was, at the time, an easy decision: build another reservoir. We are just now realizing the true costs of those seemingly easy solutions.

According to a 1990 report by Roy Frye (TPWD) and David Curtis (USFWS), the most current statewide study available, Texas has lost at least 63 percent of our original floodplains and some of the most valuable, hardwood bottomlands, have been lost to reservoir construction. It is no coincidence that the best place to grow these diverse and productive wetlands is also often the best place to build reservoirs. At just 7 percent of all woody vegetation and less than 3 percent of land area in the state, these valuable and diverse habitats are a diminishing commodity. Because they are all but impossible to regenerate in any practical time frame, the hardwood bottomlands we have left are essentially irreplaceable.

Willie Sutton, who robbed more than 100 banks in his 30-year career beginning in the mid-’20s, supposedly responded to the question of why he robbed banks by saying, “because that is where the money

**A RESERVOIR NOT ONLY  
DROWNS THE RIVER WITHIN ITS  
FOOTPRINT, IT CAN SEVERELY  
ALTER THE DOWNSTREAM  
RIVER’S ECOLOGY.**



*Choke Canyon Reservoir*



*Granger Lake*



*Hardwood bottomlands at Sandylands Reserve*



San Marcos River



**FRESHWATER INFLOWS FROM RIVERS ARE THE LIFEblood OF OUR COASTAL ESTUARIES... THE HARDWOOD BOTTOMLANDS WE HAVE LEFT ARE ALL BUT IRREPLACEABLE.**

is.” It is the same reason that reservoirs are built on rivers, because that is where the water is. Water blocked behind a dam, where it can be stored or diverted to various uses is a valuable asset, but it also means that water does not flow downstream. A reservoir not only drowns the river within its footprint, it also changes the quantity and timing of downstream flows, which in turn can severely alter the downstream river’s ecology. The ecological health of a river is not just important to an aquatic biologist, it is important to you. Your health depends upon it. Just about every major inland city discharges its wastewater into a river and their discharge permits require them to treat their waste only to a specified level — a level which is typically not adequate for safe consumption. It takes additional treatment to make that water fit for taking into a downstream city’s drinking water system. We depend upon a healthy

river ecosystem to provide that natural treatment. It saves us millions of dollars and helps preserve our health. We would otherwise be subject to polluted and untreated waters. Healthy rivers that support multiple recreational uses are increasingly recognized as valuable economic assets especially in rural communities. The explosion in development of paddling trails and river walks over the last several years gives visible testimony to that fact.

Additionally, that water, if not disrupted by a reservoir, may also flow all the way downstream and into an estuary. The freshwater inflows from rivers are the lifeblood of our coastal estuaries, bringing nutrients and sediments and establishing the salinity gradients that are the basis of estuarine health and productivity. Texas’ multibillion-dollar recreational and commercial fisheries and the communities they support depend upon those inflows. Dams not only diminish overall inflows, but they can alter hydrology just as they do with rivers. The annual spring and fall floods deliver much of the benefit of these inflows to our estuaries; indeed, many estuarine organisms have evolved to depend on such spring and fall floods. Reservoirs can capture some portion of the larger spring floods and, by holding and then

releasing water over an extended period, can greatly alter the ecology of a receiving estuary. The smaller fall floods may be captured in their entirety.

There are no more easy solutions to water development, although some individuals and organizations seem not to realize it. Their first thought when faced with a water shortage is to recommend, even demand, that a new reservoir be built. The urgency is understandable but the lack of forethought is inexcusable. Texas' population is expected to double over the next 50 years to something over 46 million. The water to meet that demand is scarce but not impossible to find. The construction of new reservoirs will be only a part of that solution. A thoughtful assessment shows that, of all the strategies, it is but one and not necessarily the best. Many strategies are available; it is essential that we weigh the real costs and benefits of any strategy, but especially the construction of expensive new reservoirs.

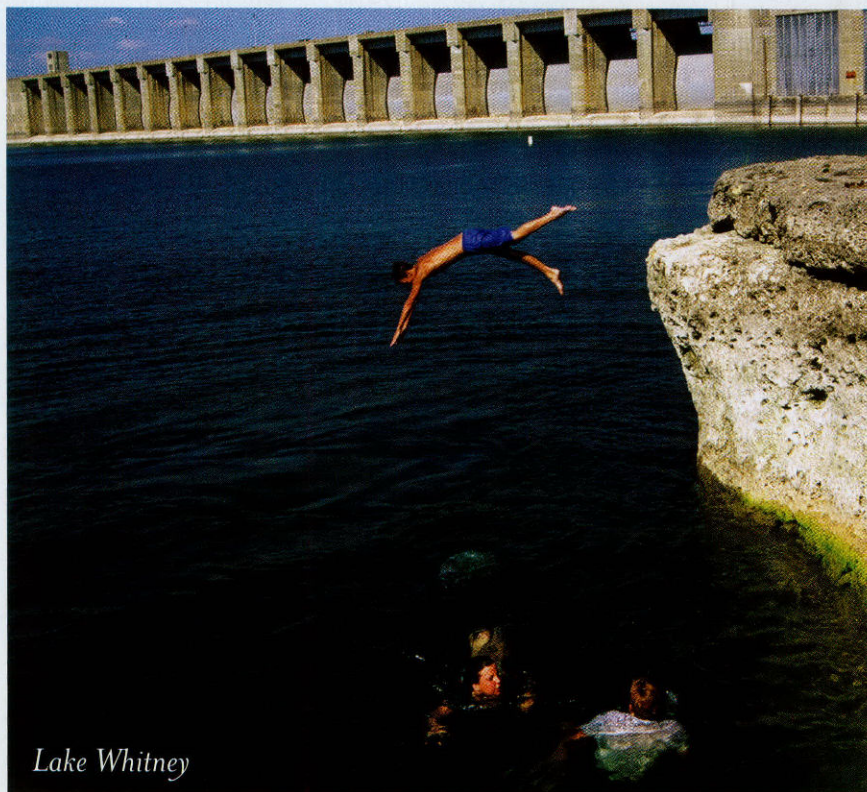
Not a single new major reservoir has been built over the last 20 years and few have been permitted. Many in the water development community have been quick to blame environmental problems and "environmentalists" for this apparent lack of progress. And, in fact, during the period following the reservoir construction boom, essentially starting in the mid-'80s, that was clearly the case. For the first time reservoir developers and the general public stepped back and reflected on what had been wrought. It was mostly good, as noted earlier, but the true costs were also being recognized. The idea of

mitigating, or compensating for environmental impacts, was considered and incorporated into water permits for reservoirs. No state permits before the mid-'80s had such provisions. All major permits since have mitigation provisions.

The late '80s was a bitter time for water developers. The teams of lawyers and engineers that so blithely sold reservoirs to local and state leaders hit roadblocks that were at one time mere bumps on the road. Where reservoirs were once eagerly sought and celebrated, Texans began to tap on the brakes. The first evidence of change was the Little Cypress reservoir in far northeast Texas. The water permit was issued after a contested and often contentious hearing. The permit included significant mitigation requirements, but the developers were resigned and ready to roll as usual until the local people said no. Twice, bond elections were defeated. Voters were not willing to fund a reservoir for which they could see no need, one that could be rationalized only by the promise of selling the lake's water to Louisiana. To this day, Little Cypress Reservoir has not been built.

As new reservoirs have been proposed

**CONSERVATION IS THE MOST COST-EFFECTIVE AND LEAST DISRUPTIVE MEANS OF PRESERVING WATER FOR OTHER USES, LIKE KEEPING ECOSYSTEMS HEALTHY AND PRODUCTIVE.**



*Lake Whitney*



*Caddo Lake*



THE  
STATE  
OF  
LAKES

*Town Lake*



*Lake Conroe*



*Fishing below Canyon Dam on the Guádalupe River*



**WE ARE BETTER EQUIPPED THAN EVER TO MAKE SURE THAT FUTURE RESERVOIRS CAN MEET THEIR WATER SUPPLY GOALS AND RECREATIONAL POTENTIAL WHILE MINIMIZING ADVERSE ENVIRONMENTAL IMPACTS.**

and opposed from the late '90s to today, developers have continued and even amplified the mantra that environmental issues are derailing progress toward meeting our water needs. They miss the point. All the mitigation issues have reasonable answers. They do have costs, yet they can and do reduce a reservoir's adverse impact to a level where they can and have been permitted. Reservoir proposals like Marvin Nichols on the Sulphur River face significant environmental challenges, but the real obstacle is people. Today, the flooding of people's homes and heritage will face stiff opposition whenever there are reasoned doubts about the need for a new reservoir. What many in the water development community have not come to realize is that Texans today are increasingly sophisticated about these issues and are not tolerant of accepting a fiscal burden or the taking of their fellow Texans' land without a compelling reason.

Much has been written in the new state water plan and elsewhere about the consequences of not meeting our future water needs as our population doubles. It is mostly dire and dark. There is a somewhat tongue-in-cheek argument that, in fact, we do have more than enough water to meet the needs of those future Texans. It is the water needs of their lawns that we cannot meet! The serious point being that there are numerous water development strategies that should be fully realized before contemplating a reservoir. More and more Texans demand we do so, and it is just common sense. One of those strategies is water conservation. It is the most cost-effective and least disruptive means of preserving water for other uses, like keeping riverine and estuarine ecosystems healthy and productive. It is a strategy in which all Texans can participate and, taken together, can make a significant contribution. The lawn comment is no joke. It is where we waste huge amounts of water, often to create unrealistic tropical micro-climates in semi-arid deserts. Think about your own lawn in this way and I bet you can come up with a number of ways to save water. All we have to do is act on those good impulses.

Desalination, water reuse, more efficient use of groundwater and existing reservoirs, along with conservation, are a few of the more environmentally friendly water man-

agement strategies that can also help meet future water needs. The 2007 Texas water plan recognizes that reservoirs are just a part of the solution and lists some 4,500 individual water management strategies to meet water supply needs that regional planning groups have put on the table for serious consideration. Altogether they would generate some 9 million acre-feet of water by 2060. Major reservoir construction accounts for only 1.1 million (12 percent) acre-feet of that total.

Nonetheless, it is reservoirs that get the attention. They are a highly emotional issue for those involved, water developers, environmentalists and affected landowners alike. It makes any reasoned consideration of them difficult at best. Just mentioning the names of proposed reservoirs like Marvin Nichols and Fastrill can have folks running for their lawyers or their guns, and sometimes both!

If we are to ever have a chance to decrease the level of hyperbole associated with this water supply strategy, two things must happen. The development community must come to grips with the fact that reservoirs have real costs beyond those to construct them, environmental costs that must be addressed through mitigation. The environmental community must come to grips with the fact that some new reservoirs are needed and they must work with all sides to come up with reasonable mitigation for them. One avenue to begin that process might be to identify those sites where reservoirs could be considered and those sites where they should not. The original SB 1 water legislation, signed into law by then Governor George Bush in 1997, contemplated this in its beginnings. By the time the bill was passed into law, much of that intent was lost and only some much-misunderstood provisions for the recognition of ecologically significant streams and the designation of future reservoir sites remained. Designating one group of sites without simultaneously identifying the other will not work, especially if done unilaterally without all stakeholders' participation. It would not be an easy task, but it might be the basis, the beginning, of something positive.

Whether you consider it a curse or a blessing, the Texas reservoir system is a remarkable feat of engineering. The key point for TPWD is that the lakes are here and they are not going away. They provide us both opportunity and challenge in meeting our responsibilities. We are better equipped than ever to make sure that future reservoirs can meet their water supply goals and recreational potential while minimizing adverse environmental impacts. Seems easy enough, doesn't it? ★





# FISH OUT OF WATER

WITH ALL THE COMPETITION  
FOR WATER AMONG  
HUMANS, WHO'S LOOKING  
OUT FOR THE FISH?  
By Larry D. Hodge

**I**N the long history of competition for water, the fish that live in lakes and streams have generally been overlooked. Future competition for water may become so fierce, however, that failure to consider the needs of fish may be their death sentence. Texas Parks and Wildlife Department fisheries biologists, along with reservoir controlling agencies, constantly look for new ways to manage water levels in reservoirs and stream flows in rivers to try to balance the needs of people and fish.

The job is far from simple.

Two facts of geography make it so. One: Texas is a vast table with its top tilted downward from the Panhandle toward the Gulf Coast. Two: Average annual rainfall decreases as one travels westward in Texas, from about 55 inches near the Louisiana border to 10 inches or less in West Texas. Texas rivers run the wrong way, from arid West Texas to humid East Texas. West Texas reservoirs are almost always short of water, and East Texas reservoirs can drop dramatically during extended droughts.

The drought in East Texas in 2005 and 2006 sent a wakeup call to fisheries biologists and reservoir operators alike. Dave Terre, TPWD's Inland Fisheries regional director for East Texas, says: "We are used to fairly stable water levels in East Texas, and lately we've seen lakes where low levels meant we didn't have boater access. As long as there is water, the fish will be there, but we need to help anglers have access. If we don't have boat ramps in the water, we won't sell fishing licenses."

The Sabine River Authority manages Lake Fork, along with Lake Tawakoni and Toledo Bend Reservoir, and general manager Jerry Clark fears the recent drought presages things to come. "The weather does not always cooperate with us on its timing on inflows to these lakes. We have to manage between weather systems, whether it be flooding or drought. As the population of Texas and especially the Dallas-Fort Worth Metroplex grows, we will see increased demand on Lakes Fork and Tawakoni. Lake levels will vary more than they have in the past."

Fluctuating lake levels worry people in charge of supplying water for municipal and other human needs, but fisheries biologists prefer a more dynamic system. "What fisheries biologists would like to see," says TPWD Inland Fisheries district biologist Todd Driscoll, "is lake levels slowly drawn down during the summer to allow terrestrial vegetation to grow in the fluctuation zone. Then in December and January, let the lake rise to flood all that growth to provide spawning habitat and cover for young

fish. To maximize the survival of fish, maintain water levels as high and stable as possible through mid-summer, then start the whole process again."

Historically, East Texas has had rainfall in the patterns that seem to work for fisheries. "Most East Texas lakes have some aquatic vegetation, so even when they get low, they still have habitat that can protect young fish," says Terre. "When they come back up, the fish spawn and grow like crazy. In West Texas the droughts are generally longer, but when the lakes rise, they are like new lakes because of all the vegetation that grew up while they were down. Then — wow — you have some of the best fishing in the state."

SRA's Clark points out: "We can't control the rainfall. The public needs to understand that more storage capacity — more reservoirs — is the only way we can spread demand around to help maintain existing reservoirs and the fish and wildlife habitat. In the longer term, there is some potential for the reuse of water and the storage of reused water." (See "Round River," page 37.)

Many Texas reservoirs were financed by cities for water supply or by power companies for the generation of electricity, and reservoir managers are contractually bound to supply their needs first. "We have to meet the terms of those contracts," says SRA operations manager Donnie Henson. "Then we can start looking at the recreational and wildlife habitat needs. We think those are very valuable things to Texas and the rest of the nation. But the first thing we have to do is operate to keep the contracts valid."



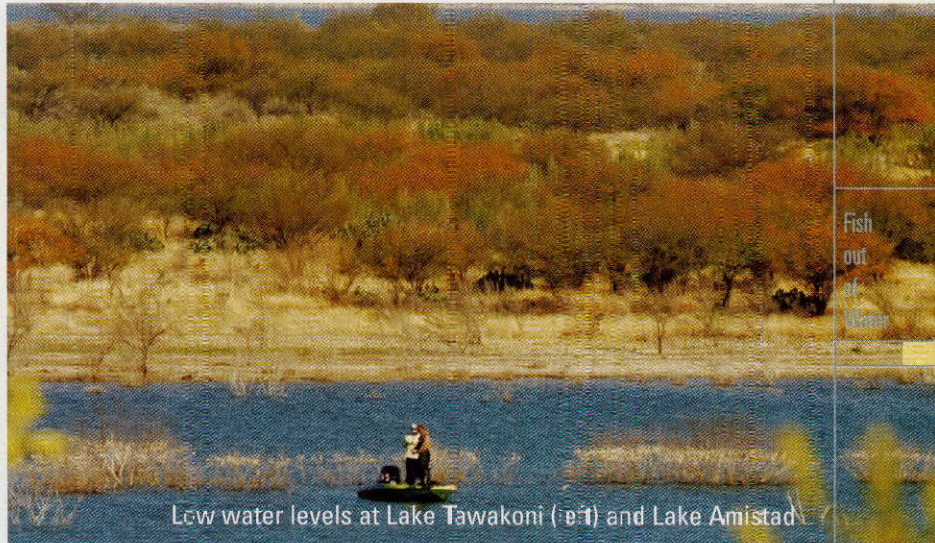
Fishing below Canyon Dam on the Guadalupe River

PHOTO © GRADY ALLEN



Hudson Bend on Lake Travis after a prolonged drought.

*Fluctuating lake levels worry people in charge of supplying water for municipal and other human needs, but fisheries biologists prefer a more dynamic system.*



Low water levels at Lake Tawakoni (left) and Lake Amistad.

Reservoir managers and fisheries biologists both are caught between a lake and a hard place — but there may be some wiggle room. Experience gained from the management of several reservoirs suggests that sometimes lakes can be managed for the best interests of both people and wildlife, or at least to minimize negative impacts on both.

“In the future, I think we need to look at water usage by people who already own the water,” says Bill Provine, chief of management and research for TPWD’s Inland Fisheries Division. “For example, take Lake Fork, the premier bass fishing destination in Texas. It has a big pipe in it leading

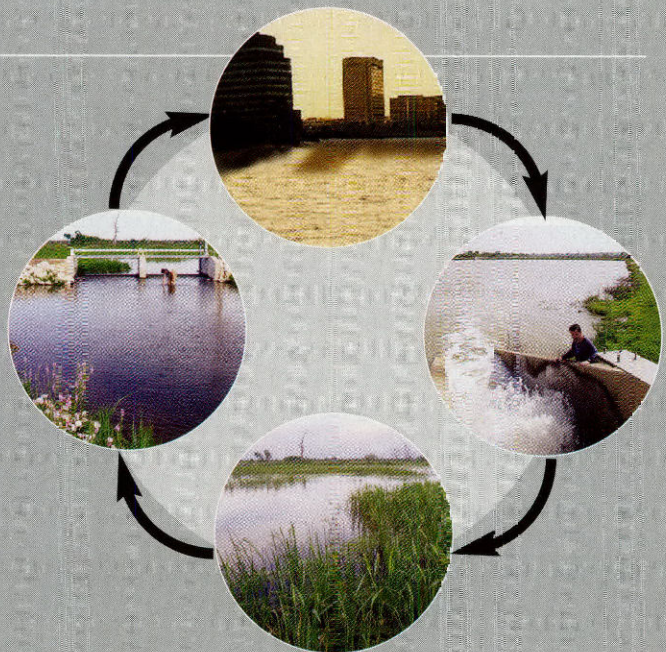
to Dallas. They have not used it yet, but someday they will. We need to be able to tell them, ‘We understand you need this water, but this is what its economic value is to fish and wildlife.’ It may influence them to let us help them manage their strategies for using it. Draw-downs have short-term impacts on reservoirs like Lake Fork, and it’s totally within our expertise to figure out when those impacts need to occur. If a city is drawing water from four lakes, it could avoid drawing all four of them down during the spring spawning season every year. Lake Fork could be left alone during the spring, then drawn down in the fall

## Round River

Aldo Leopold, the father of the modern conservation movement, titled one of his essays “Round River,” using a mythical circular river flowing around and back into itself to illustrate the idea of ecology. A cooperative project between the Tarrant Regional Water District and TPWD creates a “round river” using Trinity River water (See also “Washing the Water,” July 2006).

Water from the Trinity is routed through a wetland on TPWD’s Richland Creek Wildlife Management Area before being pumped into Richland-Chambers Reservoir and from there upstream to Fort Worth, where it flows through the city’s water mains and then begins its journey anew. The week-long trip through the wetlands improves the river water, which is as much as 95 percent treated effluent, to the point that it is cleaner than the water in the lake. “TRWD gets improved water quality, and TPWD and the people of Texas get high-quality wildlife habitat for a variety of species,” says WMA manager Jeff Gunnels.

“The cost of treating water using wetlands is about half the cost of building a new reservoir — and you don’t have to go through a 20-year permitting process,” says TRWD project manager Darrel Andrews.



Fish  
out  
of  
Water

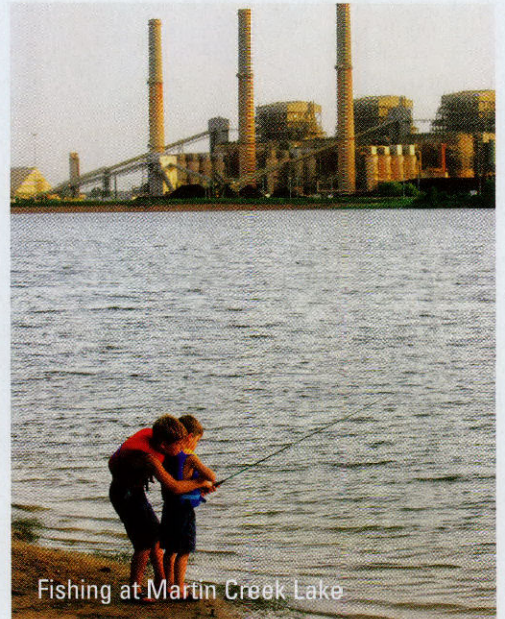
OPPOSITE © ERICH SCHLEGEL; TOP © DAVID J. SAMIS; TOP CIRCLE COURTESY DREDEGETEK TECHNOLOGIES; OTHER CIRCLES COURTESY TPWD

*Water must be used for people first, and we have to work around that through stocking and regulations to protect fish.*

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Aerial view of Canyon Lake



Fishing at Martin Creek Lake

to let vegetation grow there, when reflooded, would release nutrients into the water for fish to use. Using the economic value of recreation and fishing on reservoirs to help negotiate these strategies is going to be very important.”

Fishing regulations are another way to minimize the impacts of varying water levels on fisheries, says Bobby Farquhar, West Texas regional director for Inland Fisheries. “Reservoirs were built to supply water for municipal or other uses, and we have to be realistic about the fact that fisheries management needs are going to be secondary. Water must be used for people first, and we have to work around that through stocking and regulations to protect fish. For instance, if a lake has been down a long time and then fills up, you can stock it and then put a restrictive limit like an 18-inch minimum length on it. That buys you some time when the lake starts back down, because you protect your brood fish. It’s boom and bust in West Texas, and you have to ride the waves.”

Lake B.A. Steinhagen near Jasper is an example of the fact that in rare instances, the best way to heal an ailing lake is to remove the water. A shallow lake maintained at a high level for 60 years to aid in hydropower generation, Steinhagen silted up and became clogged with both living and dead aquatic vegetation, much of it invasive exotics like hydrilla and water hyacinth. Fishing, duck hunting and other recreational uses were severely impacted. “The lake was in the primary stages of becoming a peat bog,” says Howard Elder, a TPWD aquatic vegetation biologist. “The

controlling authority, the U.S. Army Corps of Engineers, suggested draining the lake to dry it out and allow the vegetation to freeze, then decay. We are hoping to show that well-timed draw-downs can put invasive aquatic vegetation under stress and perhaps help control it. The lake is now covered with grass five to six feet high, and when it refills, nutrients from those plants will go back into the system and make it very rich, which will be good for fish and other wildlife.”

An unwelcome aspect of reservoirs is that their construction can result in the loss of bottomland hardwood habitat. “We do have to mitigate for that when we build a reservoir,” points out SRA’s water resources manager, Jack Tatum. Mitigation involves creating a like amount of similar habitat as close to the area impacted as possible. “We work with the Texas Parks and Wildlife Department to try to minimize impacts on fish and wildlife. In addition, we feel the reservoirs don’t get enough credit for the fish, duck and other wildlife habitat they create.”

Sometimes the habitat created is in the stream below the reservoir. “Across the South in the 1940s and 1950s, a lot of hydropower dams were built, and it was found that cold-water releases from those dams caused major losses of the historical fisheries in the rivers below,” says David Schroeder, a former member of the board of directors of the world’s largest chapter of Trout Unlimited, Guadalupe River Trout Unlimited, whose home water is the Guadalupe River near New Braunfels. “So the federal government

started a mitigation program that replaced the loss of native fishes with rainbow trout. The original plans for Canyon Lake called for a trout fishery in 10 miles of tailwater supported by a consistent 200 cubic feet per second (CFS) flow, but the reality was that the releases from the lake usually diminished to much less than that over the summer. The habitat was never uniform enough to support either a warm-water or a cold-water fishery."

Working with the Guadalupe-Blanco River Authority, GRTU secured a contract that provides for a 200 CFS release of water from Canyon Lake from May through September in years when the lake is at conservation level after January 1. ("Conservation level" or "conservation storage" is the water level reservoir managers try to maintain on a given lake; it is considered "full" at this level. Reservoirs often are designed to hold flood waters in storage above the conservation level. That level is called "flood storage" or "flood pool.") "Canyon Dam happens to be the only one in Texas that releases water from the bottom of the dam, where it's coldest," explains GRTU president Mick McCorle. "That keeps the water cold enough to keep trout alive year-round up to 10 miles downstream." As a result, the Guadalupe has been voted one of the top 100 trout

streams in America.

It's not just about trout, says Schroeder. "About six inches of water from the full lake is what it takes to fulfill the contract," he says. "The Guadalupe is one of Texas's premier recreational rivers, and tubers, businesses in New Braunfels and fisheries downstream all benefit. And GBRA still owns that water — they can pick it up downstream and sell it if they want to. That six inches of water yields tremendous benefits."

"Water is a valuable resource in this state, and its value up to this point has been mainly based on its commercial value for municipal, agricultural and industrial use," says Provine. "Recreation didn't really have a value placed on it. We have started looking into the value of our fisheries. One of the first economic studies we did was on Lake Fork, where it was found that fishing yields \$27 million a year in direct expenditures. That's a huge benefit to the community, and knowledge of that is a huge benefit to anglers. We no longer have a sport that's just nice to do — it's one that brings a significant amount of money to our state. There are a lot of people at the table wanting their water — for rice farming, for cities, for industry. We can say, 'Wait a minute. That water is worth this much to anglers, and we want some of it, too.'" ★

## Hot Topic: Power Plant Lakes

Lakes in Texas often provide more than one service. For example, the state currently has more than 40 steam-electric power plant lakes that serve as sources of cooling water necessary for the production of electricity. Many of these lakes, located mainly in central and northeast Texas, provide excellent fishing, especially in the cooler winter months. Warmer water temperatures help fish remain active during the winter and early spring, attracting anglers in search of action. But there are also potential negative impacts to fish and wildlife.

Steam-electric power plants can use enormous quantities of water for cooling in the production of electricity. Current cooling water use in Texas is about 75 million acre-feet per year, expected to increase by almost 10 times by 2060.

Steam is produced either through burning of fossil fuels (i.e. coal) or by nuclear reaction. Steam spins turbines that produce electricity. Steam is cooled by lake water and warmed water is returned to the lake. During this process, fish and other

organisms may be drawn into the power plants and killed when larger individuals become pinned on the intake screens or other parts of the intake structure (a process called impingement) or when smaller organisms like fish eggs and larvae pass through the intake screens into the station (a process called entrainment). The warm water that is discharged can also be detrimental to wildlife.

To help guard against unnecessary loss of life, Section 316(b) of the Clean Water Act requires that the location, design, construction and capacity of cooling water intake structures reflect the best technology available (if the facilities were completed after December 2001). Existing electric generating plants that use large amounts of cooling water and at least 25 percent of their withdrawn water for cooling purposes are also subject to the new rules.

TPWD staff often review and comment on development proposals that may affect fish and wildlife resources. During these reviews the impacts expected to occur are

assessed, and if they are determined to be excessive, measures are recommended to minimize adverse environmental impacts. For example, minimum mesh sizes for intake screens may be recommended to minimize entrainment of eggs and larvae and minimum intake velocities may be recommended to reduce the potential for impingement of fish on intake screens.

Several power plant lakes in Texas have been the target of fish consumption bans or advisories for human health risks. The Texas Department of State Health Services may issue bans or advisories to protect public health if concentrations of harmful contaminants exceed certain risk levels. For example, a fish consumption advisory was issued in 1992 for Martin Creek Lake in Rusk and Panola counties. Fish tissue samples indicated excessive levels of selenium. The mineral is good for you in small amounts, but high doses can cause neurological problems. TDSHS has since rescinded the advisory, based on results from a new risk assessment.

— Cindy Loeffler





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PHOTO © WYMAN MEINZER

THE  
By Barbara Rodriguez  
INVISIBLE  
LAKE

THE MYSTERY, HISTORY AND STRANGE ALLURE OF CADDO LAKE.

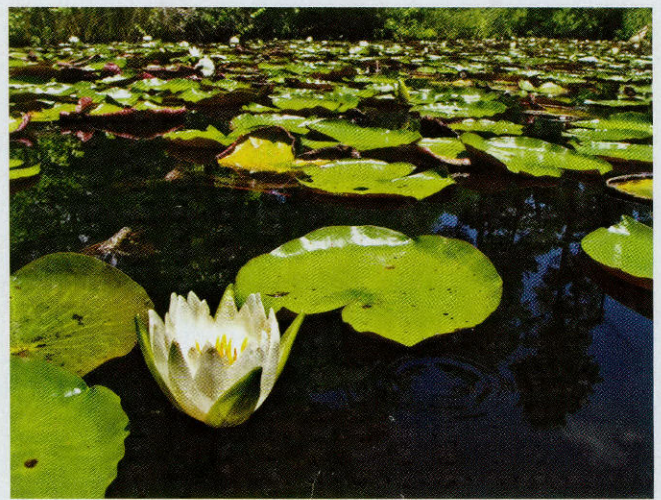
## Five hungry men hunker still as stumps

around a tiny fishing camp grocer's counter. A fisherman, his jumpsuit rasping new, strides in. "I just drove up from Houston to see the lake," he says, looking confused. "Now, how do I do that?" "Well," the grocer says, "just how much of it did you want to see?" The cramped crowd laughs. Caddo Lake laps the state park boat dock within yards of where they wait to reel in cheeseburgers, but you can't hear, see or smell it. For all practical purposes, until you are in boat-launching distance, the lake remains invisible. That's the thing about Caddo — for all its nearly 30,000 acres, however you approach it, the how-do-you-get-there-from-here question looms large. The appeal of the lake is as much about its inaccessibility — free public access is limited to two ramps — as it is about its mysterious history. As elusive as El Dorado, Caddo has never been a drive-your-Chevy-to-the-levy lake, serviced by scenic overlooks and paved parking. Its devotees work hard to ensure it never will be.

Go visit and you know at once you can never possess Caddo the way regular visitors feel ownership of, say, Possum Kingdom. Few can claim to know it the way fishermen and boaters predictably chart a day on Lakes Livingston or Whitney. Shallow depths, labyrinthine boat roads, moldering duck blinds, falling timber and flora that blooms, sprawls and climbs at preternatural rates mean the lake you see today is not necessarily the lake you get tomorrow. Even describing Caddo is not unlike an attempt to describe an elephant viewed through small holes in a fence — with the mammoth leaning on the fence. Wide views are hard

ture is in fact thousands of tiny snapshots.

Separating Caddo's myth from its reality is equally difficult. Though consistently labeled the only natural lake in Texas, it's not (although it is the largest and maybe the only one with public access). Unlike most Texas lakes it is a lake with a past, albeit one shaded by



to come by; the broadest expanses are seen from the lake. Otherwise you are limited to peep shows through the humpy knees and elbows of cypress, nets of Spanish moss and reflections in amber waters. Observation requires a keen sense of what is beyond the shaded and slivered sightlines. Your ears are witness to a slosh that might be a gator or the collapse of a card stack of turtles. A misty early morning scene wafts into memory even as you watch when the slant of light intensifies, burns off the fog and dapples the scene. The harder one strives to get an accurate impression of the lake, the more one realizes that like a David Hockney painting the big pic-

tall tales and time. Where and when did it all begin? As with all creation theories there is no consensus. Some say that in the beginning there were earthquakes. Others tell of a Great Flood borne of a Great Raft leading to a Big Bang — of sorts. Then there are those who claim it all began with the Fairy. The unknow-



The  
Invisible  
Lake



able is central to the ongoing attraction of the vast wetland that is actually a maze of bayous, bogs, sloughs and backwaters sprawling along the border between Harrison and Marion counties in Texas and Caddo Parish in Louisiana.

**The Earthquakes**

The Caddo, Native American mound-builders, believed the lake was birthed by floods swelled by earthquakes. Recorded history testifies that as recently as 1811 a series of earthquakes around New Madrid, Missouri, tumbled and twisted the earth as far as the Pineywoods, whip-cracking rivers into new courses. Even today plenty of lake dwellers believe these temblors pooled waters into Caddo Lake. The ancient cypresses that lend the lake its distinctive character know the full truth, but they're offering only one hint: a cypress seed will only root in water. The age rings of the cypresses that wash their knees in the Caddo give witness to a primordial puddle here as long as 400-600 years ago.

TOP © GREG LASLEY/KAC PRODUCTIONS; BOTTOM AND OPPOSITE PAGE © GRADY ALLEN



### The Flood

Many geologists believe that the modern lake is the result of a behemoth log jam on the Red River. The logs that bobbed, lolled and banged themselves into a mind-boggling 100-mile geometric construction known as the Great Raft were described by the government-commissioned Freeman-Custis exploratory expedition in 1806 — five years before the Madrid earthquakes. The fallen trees, wedged impossibly tight between the banks of the Red River near the present site of Shreveport, swelled all connected waterways. By the 1840s Big Cypress Creek was deep enough to invite serious navigation, and the brief but glorious era of steamships huffing from New Orleans to Jefferson began.

The fate of the log jam holds the most water in the tale of Caddo's genesis. In 1873 the Army Corps of Engineers blew the raft to bits in a Big Bang that pulled the plug on Cypress Bayou. The lake left behind is seldom deeper than 4 to 6 feet and changes character from

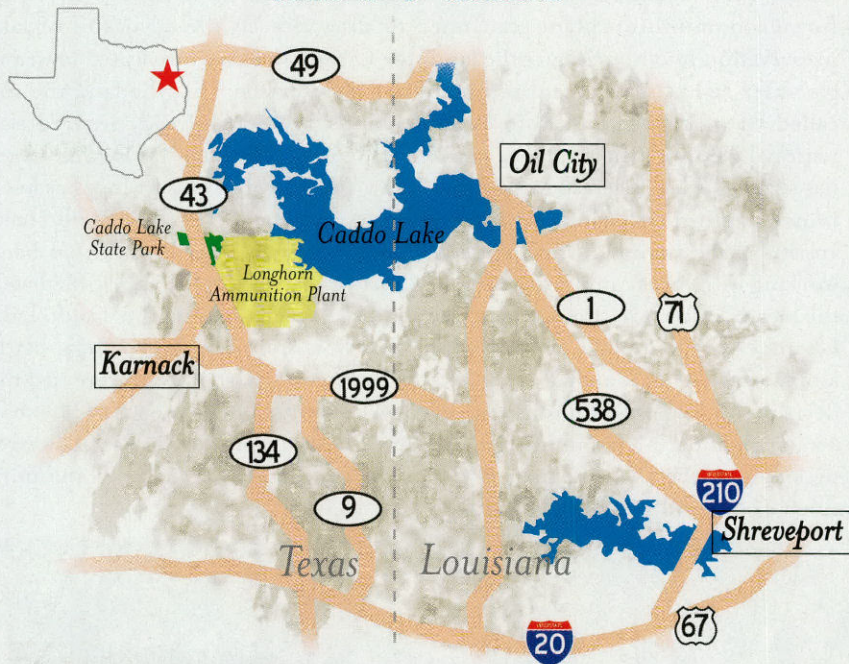




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PHOTO © LANCE VARNELL

## CADDO LAKE



The Invisible Lake

season to season. In the winter, it is window-glass clear as vegetation dies off and settles; in the summer, water that isn't heavily traveled is carpeted in the shady greens of spatterdock, duckweed and hyacinth. Where sediment is suspended the water is the color of steeping tea.

### The Fairy

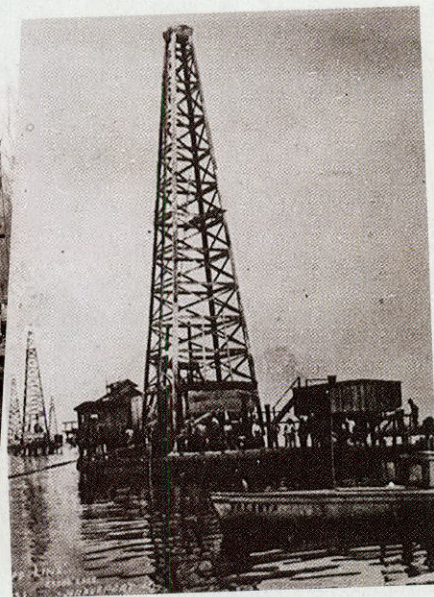
But let us not forget one last contributor to our tale. Before the earthquakes and the Great Raft, there was the Fairy. Fairy Lake. On its glistening footprint, hundreds of years before quakes or raft, some say the Caddo was born when the Fairy and Sodo Lakes flooded (today less romantically known as the Ferry and Soda Lakes).

### The Certainty

Over the years Caddo Lake, the second-largest natural lake in the south, has wallowed from about 27,000 acres to an oozing 40,000 acres (half in Louisiana). The lake's popularity and the sanctity of its ecosystems have waxed and waned with its depths. When the Caddo Indians sold their land and moved away in 1835, an era of industrial exploitation began. Sawmills set to grinding away the coveted first-growth cypress at such a rate that by the turn of the century the most desirable timber was a memory. The first over-water drilling platform in the U.S., Ferry Lake #1, was built by the Gulf Oil Corporation in 1911, producing 450 barrels a day. Oil derricks sprang up across the water before wildcatters sought slicker pastures. The oil boom gave way to the brief, but passionate, pursuit of freshwater pearls (considered spectacular even at Tiffany's) until a dam built in 1914 flooded the mussel beds. With oil interests gone and pearl profits drowned, the first efforts to protect the lake's fragile ecosystem were launched. A 483-acre state park built in 1934 soon seemed a small stand against the deleterious effects of manufacturing TNT at the Longhorn Army Ammunition Plant from 1942-97.

### Preservation Efforts

Preservation efforts gained momentum in 1993 when The Nature Conservancy purchased 7,000 acres to be merged with the Caddo Lake State Natural Area (they also own the 1,000-acre Caddo Lake Preserve.) The same year,



Left: In 1873, the Army Corps of Engineers blew up the log jam known as the Great Raft, lowering the lake level and ending the steamship run from Jefferson to New Orleans. Right: The first over-water drilling platform in the United States was built on Caddo; more sprang up across the water soon after.

Caddo Lake became one of 17 U.S. areas protected by The Ramsar Convention, an international treaty dedicated to the worldwide protection of wetlands. Caddo's champions appreciate the biological wealth within its unique eco-niche. It is home to more than 200 bird species, 71 fish, 47 mammals and — perhaps most easily viewed — more than a dozen species of turtles, including the loggerhead. Flora includes not only the distinctive bald cypress, but 189 species of trees and

shrubs, 75 grasses and 42 woody vines. There are many threatened, endangered or rare species among the treasures, although the attentions of the lake's suitors show signs of success. Alligators, though not as common as earlier, have made a slow crawl back since the 1960s. There is talk of black bears ambling in, too. Most thrilling are reports that the ivory billed woodpecker, a whopper of a bird long thought to be extinct, has been heard, if not yet seen in the area.

LEFT © R.B. TALFOR/USGS; RIGHT © L.S.U.S. ARCHIVE



Still, threats to the lake continue. As the 21st century dawned, the site of the former ammunition plant continued to draw fire. While advocates of lake preservation fought to secure the land, the City of Marshall attempted to wrangle water rights as an incentive for industrial interests. That the land the so-called Water Barons looked to develop abutted property already secured as a national wildlife refuge further rankled the conservationists' ranks. But never has so small a lake been so loved by so many. The Nature Conservancy has been joined in efforts to protect the lake by a diversity of defenders. The Caddo Lake Institute, the brainchild of former Eagles front man Don Henley, has been working with local communities for the past 15 years. In 2001 CLI joined with the city of Uncertain, the Greater Caddo Lake Association and the Caddo Lake Chamber of Commerce as the Caddo Lake Coalition in a fevered legal battle against the City of Marshall. In 2006 the Supreme Court of Texas reversed the decision by the Texas Commission on Environmental Quality to grant Marshall a water right permit for industrial use. Nevertheless, according to Rick Lowerre, president of the CLI, the matter is yet to be resolved: "Marshall can still pursue it again, and I suspect will do so."

Meanwhile, the ammunition plant is being converted to the Caddo Lake National Wildlife Refuge. According to Lowerre, about half the approximately 8,500-acre site has been transferred to the U.S. Fish and Wildlife Service. He says much of the balance may be transferred this year, as remaining portions of the site are decontaminated. There is hope that some of the refuge will be open to the public by this fall. If the wrangling over water rights begins anew, Lowerre predicts the Caddo Lake Coalition will negotiate a resolution that will allow some industrial use of water, while protecting the timing and amounts of instream flows to Caddo Lake.

#### **The Future is in the Flow**

Under best-case scenarios it is difficult for a shallow lake to keep its health. After the Corps of Engineers built Lake O' the Pines dam on Big Cypress Creek upstream of Caddo, the regulated water flows eliminated floods that had swept out unwanted sediments, washed in nutrient-rich topsoil and inhibited invasive plant growth. Because Caddo Lake has several other water sources, it did not experience extreme drought conditions in the past five years, but water levels have been somewhat distilled. Though January's heavy rains brought lake levels to normal, the lake's pH balance, oxygen content and heavy metal contamination (from coal-burning plants) are long-term concerns. (Already there are warnings about excessive consumption of fish due to mercury levels.)

The good news is that the recent rainfalls have allowed the Corps and the Northeast Texas Municipal Water District to explore the effects of systematic releases of water from Lake O' the Pines, as recommended by studies sponsored by the CLI and TNC through the Sustainable Waters program. The goal is to determine how much water is needed to maintain the ecological health of Caddo Lake as habitat for animals and plants while supplying adequate water for human needs, including recreation.

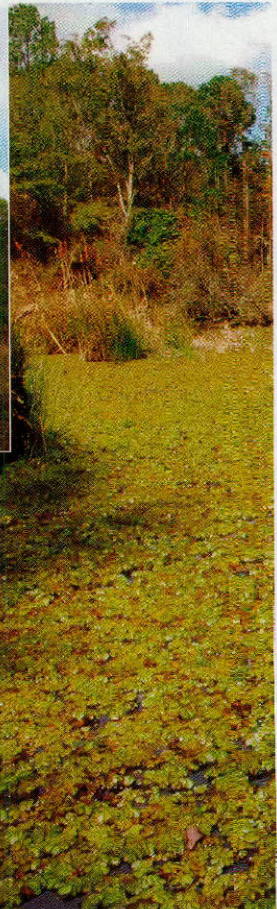
But according to Tim Bister at TPWD Inland Fisheries Division, water flow isn't the only reason plants like water hyacinth have become problematic. Several warm winters have contributed to



overgrowth, he notes. Current conditions allow hyacinth and other non-native species to out-compete native aquatic plant species.

An even more invasive non-native species is a greater concern. Giant salvinia (*Salvinia molesta*), a rapidly spreading aquatic fern, has the growing power to choke out the oxygen and sun plants and fish require to thrive. Bister confirms that giant salvinia was found in Caddo in May 2006 in Jeem's Bayou, in Louisiana. TPWD treated almost 200 acres with herbicide, but the plant has since been found on the Texas side of the lake. "This past winter, a lot of the giant salvinia that remained in Jeem's Bayou drifted into the main lake with high water flows from rain and northerly winds," Bister writes. Herbicidal treatments will continue, but TPWD training allows members of the public to identify, remove and properly dispose of giant salvinia. "This effort will be extremely important in the case that just a few of these floating aquatic ferns end up in a new location. These volunteers can remove the plants before they become a problem. The control of giant salvinia is a main priority of TPWD."

Back at the camp grocery, the burgers arrive. The fisherman heads off to a marina for his look at the lake. Out of sight, the Caddo continues its centuries-old struggle to survive. To the casual observer the lake today is very much the lake of the past, the silver capes of the wizened cypress rippling on in stark contrast to the dark hollows of loblolly, sweet gum, oak and sassafras. The rogues and wranglers who assaulted the lake in centuries past have been replaced by generations of families who fight today to keep the lake the way they say "it has always been." The irony of course is that is impossible — a history of dams, industry, drought and invasive species can't be erased. What matters is that a delicate balance between man and nature is established to guarantee a future for the lake that is with us today. The fight will be fought by dozens of champions who sometimes find themselves at odds, although in principle they all want the same thing: a healthy preservation of the somewhat elusive, somewhat mysterious character of the lake they love — even sight unseen. ☆



Giant salvinia (above) has been the focus of eradication efforts, including training volunteers to spot and remove the non-native invasive plant. Caddo Lake is home to 71 kinds of fish and more than 200 bird species, like the largemouth bass (left) and great egret (below).



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PHOTO © ANDREW R. SLAYTON

The Dallas skyline, as seen from White Rock Lake.



By John H. Ostrick

# WHITE ROCK'S SECOND CHANCE

AN EXPENSIVE DREDGING PROJECT  
SAVED DALLAS' POPULAR OASIS,  
BUT ONLY IMPROVED WATERSHED  
MANAGEMENT CAN PREVENT IT  
FROM FILLING UP WITH SILT AGAIN.

White  
Rock's  
Second  
Chance

**ON** a muggy spring afternoon, J.R. Compton walks deliberately along a greening patch of Sunset Bay shoreline at White Rock Lake, about five miles from the Dallas urban core. Unfazed by large piles of dark clouds portending an approaching storm front, he studies trees above him fluttering with new growth.

"I was hoping to see some woodpeckers that were in these trees yesterday," he says softly, his curly grey locks mimicking the wind-blown foliage.

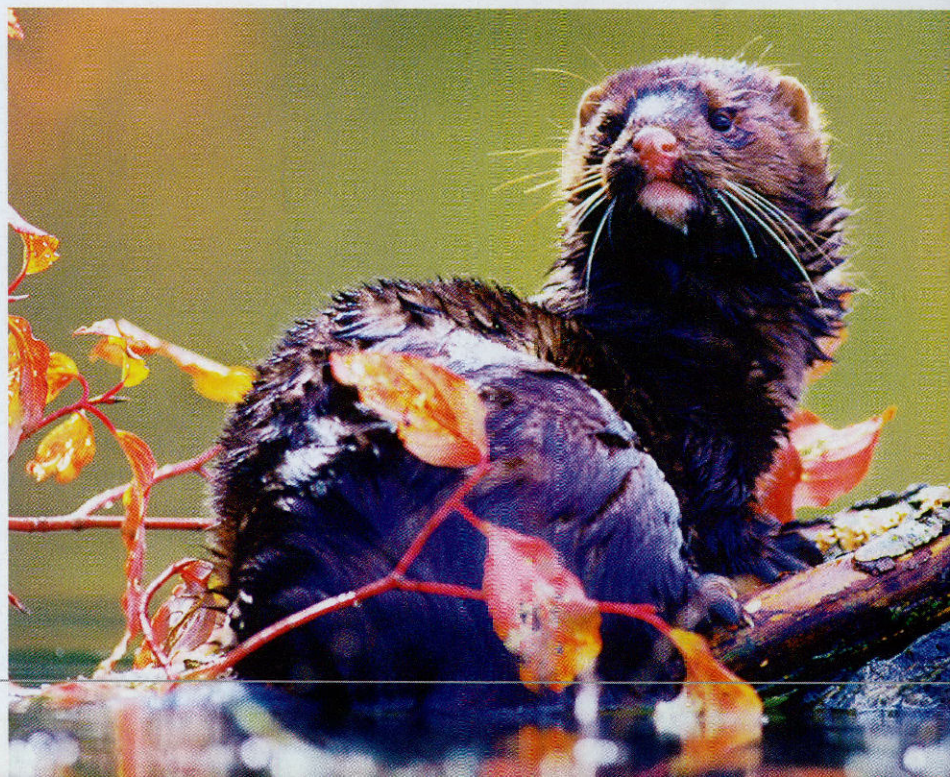
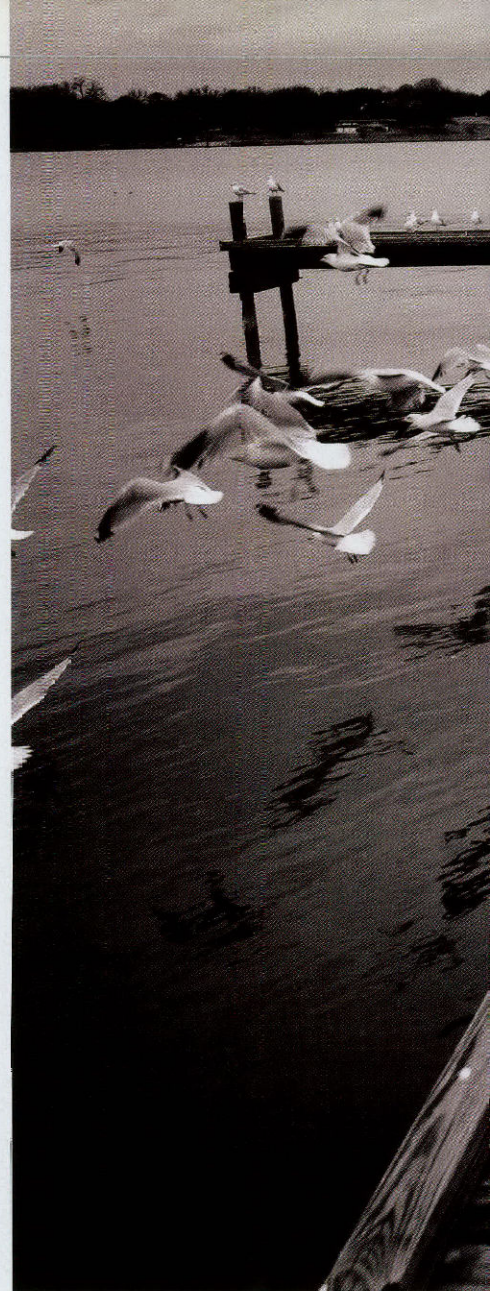
Compton, a regular visitor to White Rock since he attended the University of Dallas in the 1960s, began photographing the more than 217 species of birds here about three years ago. His *Amateur Birding Journal* ([www.jrcompton.com/birds](http://www.jrcompton.com/birds)) brims with images of both the spectacular and the charmingly mundane of the lake's feathered life. His daily lake pilgrimages are a constant learning process.

Compton is but one of the thousands drawn to White Rock each week. As he speaks, a woman and her two children flaunt a "do not feed the waterfowl" notice posted awkwardly behind a tree, tossing white bread crumbs to a small army of ducks and geese. A jogger plods by, followed by two whizzing cyclists. Down the shoreline, a fisherman sits languidly in a cheap folding chair, watching his line.

This 1,100-acre lake, constructed as a water source for a growing Dallas in 1911, has been called everything from the city's fitness epicenter to its soft soul. The urban pressures that tug at it offer insight into the life cycle of a lake and into the effects policy, politics and population growth have on lakes in Texas and across the nation.

The lake and surrounding park — home to a diverse population of mammals, including bobcats, red foxes and minks; reptiles, including rattlesnakes and horned toads; and amphibians — receive heavy recreational use. Its fervent supporters have fostered grass-roots efforts, including the White Rock Lake Foundation, founded in 1989, and For Love of the Lake, formed in 1995. The foundation was a critical force in a \$9 million bond package that helped dredge what was a clogged lake in 1998, and volunteers with the Love of the Lake have hauled hundreds of tons of litter and recyclables from the lake's shores in more than 100 consecutive months of second-Saturday spruce-ups.

As Richland College professor and unofficial White Rock historian Steven Butler describes in his *History of White Rock Lake Park* (Poor Scholar Publications, 2004), bison once roamed the creek bottomlands of what would become White Rock Lake as settlers began arriving in the 1840s. A growing Dallas dammed up the valley surrounded by tall rock embankments in 1911. People ventured "out in the country" by carriage to watch the reservoir fill, which it did by 1914. When White Rock became inadequate to meet Dallas water demands, Lake Dallas (now Lewisville Lake) was impounded in the late 1920s, and in 1929 the area received city park designation under the auspices of the Dallas Park Board. The lake underwent its first dredging operations in 1937. President





White  
Hocks  
Second  
Chance

Gulls search for food near a dock.



Mirck

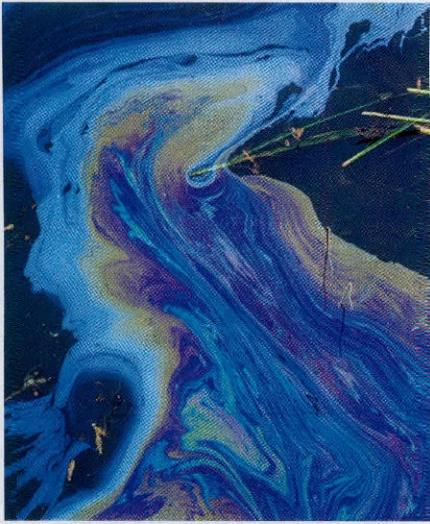


Bobcat cub



Great egret

TOP PHOTO © ANDREW R. SLATON; BOTTOM PHOTOS © TIM FITZHARRIS



**SOME ECOLOGISTS WERE PREDICTING THAT WHITE ROCK LAKE WOULD BE COMPLETELY FILLED WITH SEDIMENT AND DEBRIS BY 2034.**

Franklin D. Roosevelt's Civilian Conservation Corps undertook several permanent lakeside improvements between 1935 and 1942. Subsequent dredging in 1955 and 1974 served as temporary band-aids for the lake. (For more history, see [www.watermelon-kid.com/places/wrl/wrl.htm](http://www.watermelon-kid.com/places/wrl/wrl.htm).)

Silting problems at White Rock are easy to understand. The lake's watershed is a

narrow 100-square-mile band along the 30-mile-long White Rock Creek that stretches from its upper reaches in Frisco through Plano, Richardson and North Dallas into the lake — the Dallas-area growth corridor of the past 30 years. Water escaping the lake's spillway travels another eight miles south before emptying into the Elm Fork of the Trinity River.

As an urban watershed is developed, vegetation and land are stripped off to build houses, roadways and shopping centers. When it rains, that ravaged soil washes into creeks and flows into the lake.

In the early to mid-1970s, the area around Interstate 635 (LBJ Freeway) in North Dallas started to explode. In 1970, Plano had a population of 17,872; it doubled in size every five years into the 1980s. By 1990, the city of 72 square miles had grown to 128,713. About 25 years ago, Frisco had a population of 2,000; by 1990 that number had only grown to 6,000. The population growth rate since 1990 has been phenomenal, with a 400 percent growth rate over 10 years, making it the fastest-growing city in Texas and one of the fastest in the nation.

Although it is about 23 miles from the Bath House Cultural Center on the north side of White Rock Lake to the Frisco Texas League ballpark that opened in 2003, the explosive growth from the top of White Rock's watershed to its heart has had an enormous impact. And although environmental impact practices have improved in recent years, the countless wooded areas, farms and ranches scraped and developed to the north in the past 25 years contributed significantly to the sediment flows, nutrient runoffs and erosion problems in the creeks feeding the lake.

In 1990, the Environmental Protection Agency instituted storm water regulations that attempted to clamp down on unregulated storm water flows, but they were too late to help prevent the clogging of White Rock. When a watershed is built out, the runoff can increase, which causes higher velocities that eat away at its tributary banks, accelerating silt loading. The City of Dallas has begun armoring the creek banks to curtail erosion problems.

"Whether it is in an urban or rural situation, watershed management is critical to water quality," explains Pat Radloff, Water Quality Program Leader for TPWD.

"It's not just what happens on the shores of the lake — the quality of the water body depends on what goes on in its tributaries, and their tributaries."

A 1988 U.S. Geological Services study offered a comprehensive look at the sediment entering White Rock. By the 1990s, the lake's sediment build-up had reduced the depth at its north end to less than a foot. Some ecologists were predicting that White Rock Lake would be completely filled with sediment and debris by 2034.

In 1994, the City of Dallas utilized an EPA grant to hire Carter & Burgess, a Fort Worth-based architecture/engineering/construction management company, to do a Clean Lakes Study of White Rock to determine its overall condition.

The study verified the lake's high sediment levels and found that during certain summer periods its dissolved oxygen could drop, threatening the fish population. Tests

TOP LEFT AND RIGHT BY TPWD; BOTTOM COURTESY OF DREDGETEK TECHNOLOGIES, INC.



for a whole host of contaminants required under the Clean Lakes Study found none above action level, however.

A grassroots effort led by White Rock-area groups won a bond issue to address the lake problems. It raised half the money needed to do the project, and the city committed to provide the other half out of its operating budget.

An ensuing study involving where to put the dredged material involved 72 sites all over the city and some highly vitriolic public meetings. "We found a site 17 miles south of the lake that was a series of old gravel pits dug out in the 1970s to acquire dirt for highway projects to the north," says Burt Weatherbee, manager of the company's water infrastructure unit and project manager. "They were ripe for being filled up."

In an ironic environmental circle of life, silt and sediment that streamed from

northern expansion into White Rock would be pumped back to the gravel pits that had previously yielded materials used to build the infrastructure that supported that growth.

A hydraulic dredge, basically a big vacuum cleaner, sucked up 90 percent water and 10 percent sediment, and pushed the slurry mixture down a 24-inch steel pipeline to the pits, where it was discharged. After about 72 hours, the sediment settled out and the cleaner water off the top was removed and discharged via pipeline into a South Dallas creek.

"We ended up filling 200 acres of pits with four or five feet of sediment," Weatherbee says.

The dredging company kept a collection of items recovered during the project, including three handguns, two bowling balls, a ski pole, skateboard parts, and a host of different house and auto parts used

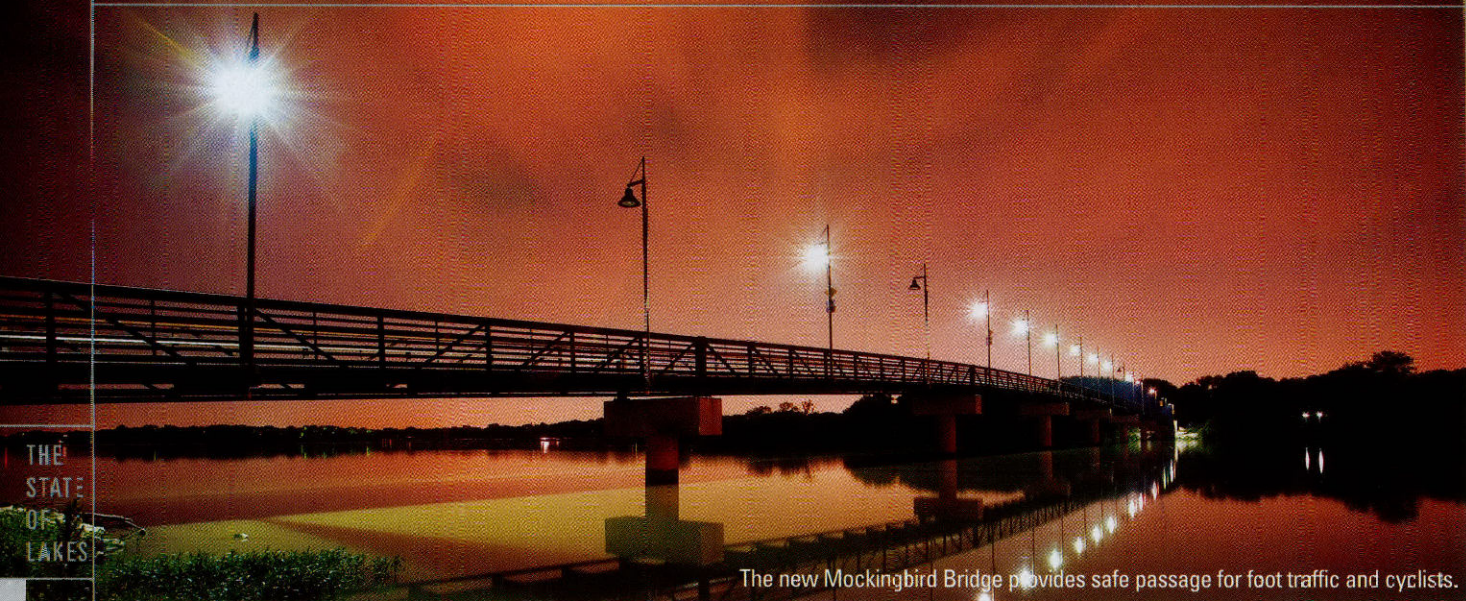
as fishing weights.

"We determined we could only dredge about 3 million of the 5 million cubic yards of sediment in the lake and stay within the budget," Weatherbee explains. "Our goal was to try and make as much of the lake as we could at least eight feet deep. Sunlight can't penetrate that depth, which limits the vegetation growing on lake bottom and provides a cooler layer of water for fish during the summer months. We backed into a dredging area, from about halfway up the lake. We dredged up to six feet deep of sediment in some areas."

The construction and dredging process took about nine months, from January to September. Although his company hopes that the dredging process will last 20 years, it's impossible to predict, Weatherbee says.

Re-testing conducted a couple of years ago found that the lake isn't re-silting quite as quickly as expected. "In a small lake,





The new Mockingbird Bridge provides safe passage for foot traffic and cyclists.



re-silting could happen in 10 years," Weatherbee says. "On a larger lake like White Rock, we hoped it could be 20 or more before it needs to be done again. Now that development has been completed in the watershed, the rate of sedimentation is slowing down."

Business is good for Weatherbee's company, which has completed about 17 other projects in the state since White Rock.

"We can repair some damage, as was done at White Rock Lake, but at what expense?" says Cindy Loeffler, water resources branch chief of TPWD's Coastal Fisheries Division. "We need to look at the bigger concept of watershed management and brush control. If we had a little preventative medicine going in, taking care of the watershed to prevent the heavy sedimentation, maybe it (clogging of White Rock) could have been avoided."

White Rock is but one puddle in the state's lake system, and each faces a continuing battle of how, and for what and

whom they are used. The state did most of its heavy lifting in reservoir construction after the severe drought of the late 1950s, with projects ebbing by the 1970s.

"The big water storage lakes in Texas have a silt build-up factor planned into them, but many times that is a 50-year sediment life," Weatherbee says. "A lot of those lakes are reaching that 50-year point now, so you are going to have issues as sedimentation starts to infringe on the water supply portion of the lakes."

Whether dams are constructed primarily for water storage, power generation or recreation, however, every lake will follow the same general life cycle. As years go by, aging effects cause a lake to get shallower and more nutrient-rich until, left uncorrected, it turns into a marsh, wetland or bog.

In Texas recreational lakes especially, many water quality, silting and bank erosion problems are linked to the lack of stabilizing vegetation on the shore.

"If the body of water is in a state park, we

encourage them to leave the habitat and vegetation around the shore as a buffer for water quality and soil stabilization purposes, but also for wildlife habitat," explains Kathy Boydston, a wildlife management specialist with TPWD who reviews a wide range of the state's development projects for environmental sensitivity. "We recommend that when reservoirs or lakes are built a vegetation buffer is maintained around the lake's edge. It stabilizes the soil and cleanses some of the pollutants out of the runoff, and helps create good fish habitat."

Other local conditions may also impact a lake's life cycle. Cities and industries often dump materials into lakes that accelerate the growth of plankton. One such material is point-source pollution, such as discharges from municipal wastewater treatment plants; although the waste is cleaned up, some pollutant loadings remain in it. Another is non-point source pollution, untreated or less-treated water that makes its way into the state's water systems. In an urban environment such as the White Rock



## THIS 1,100-ACRE LAKE, CONSTRUCTED AS A WATER SOURCE FOR A GROWING DALLAS IN 1911, HAS BEEN CALLED EVERYTHING FROM THE CITY'S FITNESS EPICENTER TO ITS SOFT SOUL.

Lake area, urban storm water runoff is a smorgasbord of animal feces, fertilizers, and oil and grease from cars. In a rural setting, non-point source pollution could come in the form of agricultural animal waste and fertilizers.

"Probably the biggest unresolved pollutant issue right now is what we call nutrient loading, the nitrogen and phosphorous loads that give rise to algae blooms in lakes," says TPWD's Radloff, a chemist formerly of the Texas Commission on Environmental Quality's wastewater regulatory program. "The trick is finding a happy medium in managing water sources for both recreational and consumer use. For fishery managers, it's good to have a certain amount of algae bloom because it is the primary food source in a lake. Too much algae, however, affects the amount of money spent in treating the odor and taste problems in drinking water drawn from a lake."

Despite White Rock's age and urban location, the fish population is abundant

and generally free of pollutants, notes Tom Hungerford, a TPWD fisheries biologist for lakes in Dallas, Denton, Rockwall and Tarrant counties (except Lake Ray Roberts). Motor horsepower restrictions limit the amount of boat fishing here.

Hungerford's office conducts rotating fish samples from lakes in its district every four years. State health services personnel also identify lakes they want to test fish from each year.

"The biggest threat to fish populations today is water demand, and how it leads to unstable water levels that upset spawning patterns," he notes.

Texas lakes are highly managed for various uses, be it for public water supply, fisheries management or other recreational use. Texas has many power plant lakes, originally created to provide once-through cooling waters at power plants. Variances in use can influence how rapidly a lake matures and what measures are possible for a variety of ills, from heavy sedimentation to elevated mercury levels.

"Reservoirs are manipulated water bodies, and the lake cycle depends a lot on how the reservoir is operated," explains biologist Dave Sager, a 19-year TPWD veteran with the Inland Fisheries Division. "In Texas, we have some reservoirs that rarely fill up, and everything that comes into it stays in it, and others that have a great deal of water released, which can come from down in the water column or at the surface."

State agencies watch and manage the fisheries in Texas reservoirs. The process of producing Goldilocks' just-right porridge

is a lake-management balancing act: They try to make sure that nothing cuts off nutrients that enter the lake naturally or oversupplies nutrients, manage wastewater treatment plants, ensure people fertilize lawns in a reasonable manner, and effectively manage runoff of silt and sand loads from construction.

"Urban lakes are much more of a challenge because things can change so quickly," Sager explains. "Construction projects far out into the watershed can have a great effect on the reservoir, as do fertilizing practices. Many of us fall into the trap of thinking that if a little is good, more is better. With fertilizers, that only works to a point without having ramifications. Things done individually can have drastic effects in an urban situation when looked at in the aggregate."

Making certain that urban lake enthusiasts — from joggers to birdwatchers — appreciate the importance of individual initiative is critical to the reservoirs' survival, even if the particulars of the biology involved may not be easy for everyone to understand.

"I was photographing a green heron on the far side of the bridge at the Boat House recently," Compton recalls. "A runner came by, stopped, looked, and said, 'Wow, I've never seen one of those before.' There are 40 or 50 of them in trees there. I know he runs by them all the time, but he just never noticed them before."

In protecting the health of Texas lakes, getting more people to stop and notice is a large part of the battle. ★



WHEN LAKE FALCON'S  
WATER LEVEL DROPS,  
GHOST TOWNS  
EMERGE FROM THE DEPTHS.

# SUNKEN CITY

By E. Dan Klepper

The ruins of a bridge that once linked Guerrero to Zapata, built in 1941.



## Arturo the gatekeeper steps from the shadow of his

sandstone dwelling into the light of the early afternoon. His simple abode, a blade-sharp rectangle of rocks, lies along the boulevard of a Mexican city built more than two and a half centuries ago. A coyote skull rests on one of the building's cornerstones. Arturo's dog, rusted from her rap by the arrival of visitors, appears at the edge of the Tamaulipan thornscrub, then waits patiently for a friendly sign before approaching. She is shy or cautious, one healthy brown eye avoiding the visitors' gazes, one failing blue eye ticking hard like a ricocheting marble.

The surrounding countryside is radiant with spring flowers and berries. Scores of blackbrush have gone lemon-white with blooms. Their scent permeates the air in a mask more savory than sweet, a smell that attracts and repels all at once. Ruby berries of *tasajillo* droop from sticky branches like fly-blown orchard fruit. The ground around them is covered with verbena.

Arturo instructs his dog to sit and remain calm. Then the gatekeeper coaxes a young rooster from its cage. The rooster struts across the sand and rests fearlessly in Arturo's open palm, posing for the visitor's camera. The gatekeeper begins to juggle the bird like a scarlet-wattled grapefruit. The rooster cooperates by hopping from hand to hand. Arturo holds the rooster aloft by the tail feathers and then lets go. The bird drops lightly to the ground. This is training, Arturo explains as he lifts the rooster in the air once again and then tosses him to and fro, for the cockfighting pit.

A scan of the area reveals a landscape equally at odds with the routine world; an empty parakeet cage and a deer hoof hang together from a nearby branch, javelina skulls tuck into tree forks, snake skins dry in the sun, and tidy assem-



Above: Brush emerges from Lake Falcon.  
Right: This monument on Falcon Dam marks the U.S./Mexico border. *Composite page: The remains of Nuestra Señora del Refugio cathedral.*



Sunken  
City

blages of rubber and tin teeter in cartoon-like pillars. But most surreal are the myriad stone facades lining the boulevard and the intersecting avenues that cross-hatch the horizon. As far as the eye can see, architecture collapses in heaps of square-cut blocks, barrel segments of stone-carved pillars, and remnants of lintels, pediments, keystones and voussoirs. Other structures stand erect and intact, some with rusticated walls beneath peeling stucco, others with prickly pear cactus growing from their cornices. Homes, shops, cemeteries, plazas and a cathedral all sprout from the thick vegetation, Pompeii-like, in a visage of ruin. But it wasn't a natural disaster that reduced this 250-year-old community in the Mexican state of Tamaulipas to a surrealist's rubble. It was, instead, the construction of Falcon Dam and a slowly rising tide of water.

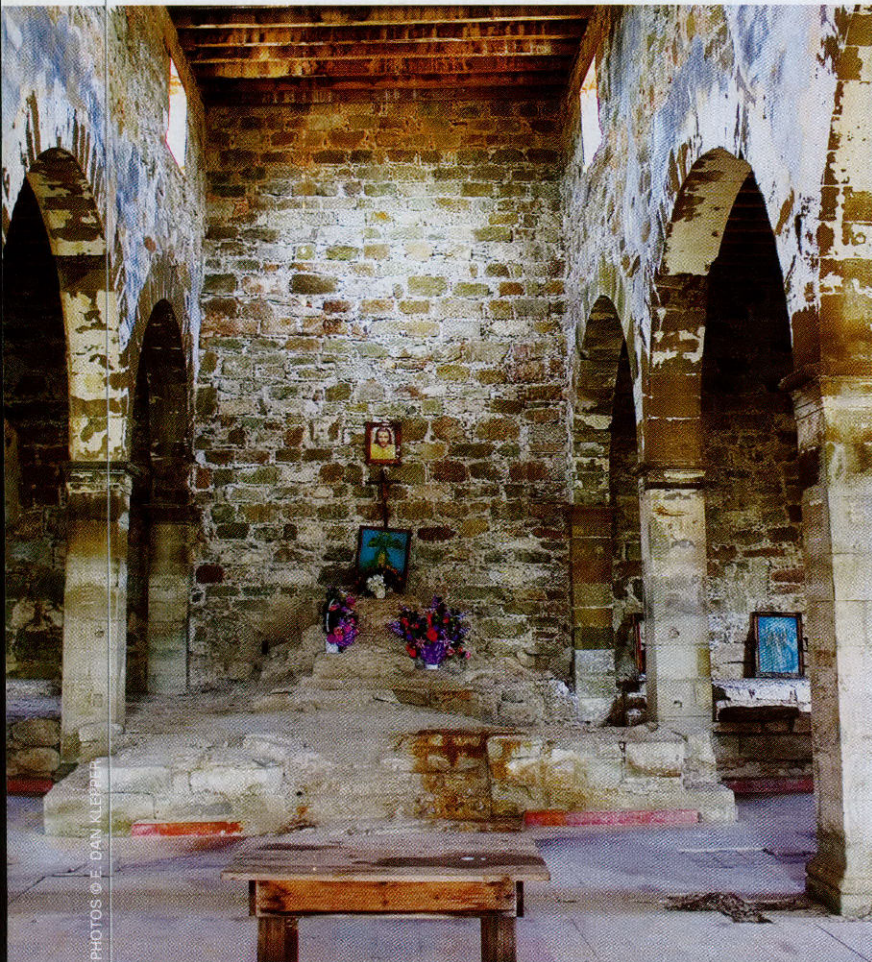
Devised and built jointly by the United States and Mexico pursuant to the Water Treaty of 1944, the International Falcon Dam and Reservoir project was put in place to provide flood control, water conservation and hydroelectric power to communities on both sides of the lower Rio Grande. The rolled, earth-fill embankment dam, with its maximum base-width of 1,000 feet and a height of 150 feet above the river bed, was designed to hold back more than 2 million acre-feet of water. But in doing so, almost 115,000 acres of the Texas and Tamaulipas landscape were submerged. Shortly after the completion of the dam, reservoir waters inundated ranches, farms, ripari-

an habitat, rural homes and, in fact, entire towns on both sides of the border. The original Texas communities of Zapata, Falcon and Lopeño went under as well as much of Arturo's charge — the beautiful Spanish colonial town now called Old Guerrero.

Arturo invites the visitors into his unlit dwelling where the sun shines as mid-day shafts through cracks in the windows' wooden shutters. Twilight illuminates the rusting works of a kerosene lantern and the shed skin of an indigo snake that hang together on a nail. Pieces of a wooden wagon lay across the floor. The abode is part residence for Arturo and his animal menagerie and part showcase for fading newspaper clippings and graying photocopies that tell the story of Guerrero's watery decline.

Established in 1750, Guerrero was once a vibrant urban center of trade with more than 25,000 citizens. The town, originally named Villa del Señor San Ygnacio de Loyola de Revilla and built near the Rio Grande at the mouth of the Salado River, was renowned for its Spanish Colonial art, enterprise and architecture. In fact, Guerrero was considered a key link in the compelling history of the entire Lower Rio Grande Valley due to its location, age and considerable beauty.

"Guerrero is a fine looking and well constructed town," a member of the Somervell Expedition observed in 1842. "The houses are built of a kind of marble or stone, with flat roofs, surrounded by a wall. The streets and public



**"THERE WERE AMERICANS WITH  
BIG MUSTACHES FISHING  
INSIDE THE CHURCH. THEY WOULD  
CAST THEIR LINES WHERE THE  
PRIEST USED TO STAND."**

*— former Guerrero resident Doña Julia Zamora*

squares (of which there are two) are well laid off, and the whole place presents an appearance of elegance and neatness. There is one cathedral in the place and several large public buildings. The inhabitants have fine gardens and throughout the place there are numerous groves of orange trees, that give it a most luxuriant and smiling appearance."

Arturo disappears behind a blanket-hung doorway and retrieves a stack of dog-eared papers. He returns and shuffles through the archive of photocopies and articles that document bits of Guerrero's history and its ultimate demise, pausing occasionally at the visitors' request. The images of Guerrero's classic cathedral, Nuestra Señora del Refugio, submerged halfway up her portico arches and relegated to a slow deterioration are painful to view.

"There were Americans with big mustaches fishing inside the church," Guerrero resident Doña Julia Zamora recalled in a 2001 interview she gave to *The Brownsville Herald* about the consequences of the Falcon project. Zamora remained in Guerrero after the completion of the dam, living above the water line for several decades after the reservoir inundated most of her community. "They would cast their lines where the priest used to stand."

But the most compelling image of all is one of a boy, barefoot and shy, pausing for the camera along a bustling Guerrero boulevard in its early 20th century heyday. The photograph highlights just a brief moment in an entire personal history, providing a glimpse into one of thou-

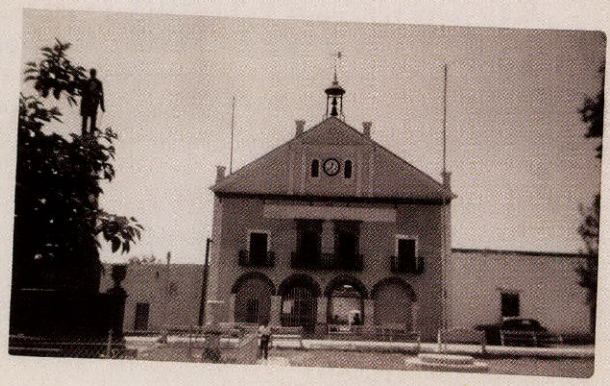
sands of stories now lost, and serves as a reminder that the real cost of progress is often our own past.

The destruction of Guerrero compromised efforts to formulate a complete picture of the southern Rio Grande River heritage. But Guerrero's demise would end up being just one of many consequences resulting from the Falcon mission to capture and control the waters of the Rio Grande.

Through the eyes of a hydrologist, however, an overview of the region's topography illustrates why the area made such a good choice for flood control and water conservation. The confluence of Mexico's Salado River and the Rio Grande lies at the region's center. In addition, veins of major and incidental drainages lace the countryside on either side of the reservoir site. Flowing into the Rio Grande from both U.S. and Mexico are the many arroyos christened after the region's attendant flora and fauna: Arroyo Huizache in honor of the saffron-flowered acacia trees that bloom throughout the countryside, Arroyo Coyotes for the proliferate scavengers, and Arroyo del Tigre Chiquito for the little tiger, or jaguarundi, that once hid in the thorny mottes. The arroyos collect the region's rainfall then channel it into the river, thereby replenishing and refreshing Rio Grande waters. And before the existence of Falcon dam, the network also contributed to massive, devastating floods.



*Guerrero before the flood.*



## DIRECTIONS TO OLD GUERRERO (ANTIGUA GUERRERO VIEJO)

Round-trip distance is approximately 60 miles from Falcon State Park into Mexico and back. A high-clearance, 4-wheel-drive vehicle is recommended.

The ruins are extensive. Hiking boots, water, food, cameras and binoculars are recommended. Watch for venomous snakes. Mountain bikes are welcome. A small fee is required to view the ruins.

Be sure to check on the latest identification requirements for crossing the U.S. border into Mexico and back via automobile. A fee may be required from the Mexican checkpoint for re-entry. U.S. dollars are accepted.

The route is relatively simple whether you are traveling south from Zapata or north from Rio Grande City via Highway 83. Turn onto FM 2098 (a sign for Falcon State Park points the way). Continue on FM 2098 past Park Road 46 (which will take you to Falcon State Park) until you reach Falcon Dam. Bypass the U.S. border checkpoint station and continue driving along the dam, where you will cross the international border between the U.S. and Mexico. Slow down at the Mexican border checkpoint station, where you may or may not be asked to stop. Once through the checkpoint, you will be traveling on Blas De La Garza Falcon. Continue on Blas De La Garza Falcon into the small town of Nueva Ciudad Guerrero (New Guerrero). Continue to the Avenida Miguel Hidalgo Y Costilla intersection. Turn left onto Avenida Miguel Hidalgo Y Costilla and continue a short distance to Highway 2 (the Nuevo Laredo-Mier Highway). Turn right (west) onto Highway 2 and continue for approximately 21 miles. After crossing Puente Rio Salado (the Salado River Bridge) continue another 3.2 miles and then look for a blue sign indicating the road to Antigua Guerrero Viejo. Turn right. Follow the rough (and often muddy) unpaved ranch road approximately 10 miles. Additional blue signs for Antigua Guerrero Viejo have been posted on the route. You will pass through a number of ranch gates along the way (approximately eight — most with cattle guards). Please leave gates as you find them. Also, be aware that these gates are locked by 6 p.m. The road terminates at Antigua Guerrero Viejo and the shores of Falcon Reservoir.





**Above: An angler enjoys the good fishing near a marker buoy on Falcon Lake.**

The cycle of inundating floods and crop-killing drought was the bane of farmers, ranchers and the myriad communities along the Lower Rio Grande Valley throughout the 19th and first half of the 20th centuries. The creation of the International Falcon Dam and Reservoir was, by federal declaration, the solution. Construction was completed just in time, in fact, to arrest the damaging waters of the historic flood of 1954. According to a report published in the *San Antonio Express* on July 1, 1954:

“Were it not for Falcon Dam, the present flood would have probably rolled into the Rio Grande Valley at a peak rate of 300,000 to 400,000 cubic feet per second, as compared with the 198,000 cubic feet per second rate at which it moved in the all-time record flood of 1932. In 1932, the valley floodway system was overtaxed to such an extent that it broke down. Only a modest stretch of the imagination is necessary to picture what might have happened this year without Falcon Dam.”

Despite the promise of flood protection, the project initially generated considerable local controversy due to the fact that towns, homes, farms and ranches would be destroyed. But much of the controversy subsided along with the 1954 flood waters. New sites had been chosen for



community relocations, and construction of new civic buildings, homes and schools had begun. Compensation was negotiated for losses of farmland, ranches and businesses despite bureaucratic clashes with the realities on the ground. And not surprisingly the character of the times perhaps more than any other factor brought resolution to most disputes (as well as the somber fact that everything had disappeared under 100 feet of water). It was, after all, the 1950s. The counties involved were predominantly rural with little influence, the impact to the population directly affected was considered incidental when compared to the needs of the growing urban and agricultural communities downstream, and the project had the imprimatur of the two countries' most powerful individuals — their presidents. Attending the dedication ceremonies were both Dwight D. Eisenhower and President Adolfo Ruiz Cortines of Mexico, leaving little doubt in the public mind that the building of Falcon Dam and the creation of the reservoir wrought compelling consequences for both the citizens and their nations.

“More than a mute monument to the ingenuity of engineers, the Falcon Dam is a living testimony to the understanding and cooperation binding our two peoples ... More meaningful and powerful than all the energy it shall generate is the force for common good which we have found in this cooperation,” Eisenhower proclaimed.

“Electric power will replace muscle power,” President Cortines responded. “The life-giving and indispensable waters, now under control, will make the sown fields fertile.”

In reality, the Falcon project failed to become an energy powerhouse. The average total kilowattage generated per year for the United States serves about 3,800 households. Nor have the fields irrigated by the reservoir waters become any more fertile than those submerged. Howev-



Sunken  
City

er, according to the International Boundary and Water Commission — the federal agency charged with applying the terms of boundary and water treaties between the United States and Mexico — the benefits of Falcon flood control exceeded \$100 million by 1986.

But the price paid for these benefits included the loss of Guerrero as well as hundreds of historic and prehistoric sites that disappeared under the reservoir's waters. These sites comprised a wealth of artifacts and information that would have provided important benchmarks in understanding the Rio Grande Valley's past. Unfortunately, federal regulations requiring archaeological assessments and site preservation did not exist in the 1950s. Thus, a significant chapter of Texas and Tamaulipas history was lost for good. Or so it was thought.

In the mid-1990s severe drought and the drawdown from subsequent water needs downstream reduced Falcon Reservoir depths to unanticipated levels. Suddenly the remains of Guerrero as well as prehistoric burial mounds, lithic scatter, artifact-filled middens, historic *ranchitas* and old townsites reappeared in the shallows. Historians have since been battling to protect and preserve the contents and the integrity of these exposed sites. Archaeologists and anthropologists have had to contend with theft, funding issues and bureaucratic recalcitrance in their efforts to launch a full-scale protection and assessment program. In addition, variable reservoir levels cause these sites to appear and disappear according to floodgate release, fluctuating river flow and downstream water usage. Most unfortunate of all, these sites have been routinely damaged by the worst possible factor — looting. As a result, Rio Grande Valley history continues to vanish.

Arturo leads the visitors back out into the sunlight then removes a key from his key ring and places it in an outstretched palm. "Para la Catedral," he says. The church is

still a beautiful place to see, Arturo insists, despite the water's destruction.

The iron gate has been forged during a more contemporary age as have the satin and glitter images of the Virgin of Guadalupe and the bundles of plastic flowers that rest upon what was once the altar. But the mammoth sandstone colonnades lining the nave and the enormous hammer-bears that support the roof leave little doubt that Nuestra Señora del Refugio is a survivor from another time. Wooden planks serving as pews line up in rows before the presbytery, suggesting a recent gathering of parishioners and offer testimony to the cathedral's rebirth. In fact, the tile floor of the entire church has been swept clean. Dried mud and stone debris have been marshaled together with a simple straw broom, then relegated to a shallow sinkhole in the floor. The broken tiles of the sinkhole form a funnel that collapses into the earth as if some giant plug had been pulled and all of the reservoir's waters that once filled the cathedral and the surrounding town had drained away just here at this spot, in the choir floor.

The ultimate fate of Nuestra Señora del Refugio as well as the future of hundreds of important archaeological sites that appear and vanish in the ebb and flow of Falcon Reservoir waters have yet to be determined. In many ways it is up to Texans and Tamaulipans, to the needs of farmers, ranchers and municipalities both upstream and down, and to the triumph of a belief in preserving the past over focusing only on the future. But perhaps the final decision will be made by the force that first inspired the region's settlements and the destinies that followed, a force that continues to shape the lives and the land that she rules with power and influence despite our efforts to bring it under our control, a force we once were proud to proclaim as mighty — the Rio Grande ★

**Above and  
opposite page:  
The ruins of  
Antigua  
Guerrero Viejo.**



THE  
STATE  
OF  
LAKES

PHOTO © ARMY CORPS OF ENGINEERS; OPPOSITE BY EARL NOTTINGHAM/TPWD

By Wendee Holtcamp

OFF-CHANNEL RESERVOIRS CAN HELP MEET WATER  
NEEDS WHILE CAUSING LESS ENVIRONMENTAL IMPACT  
THAN DAMS THAT HALT A RIVER'S FLOW.

# DAMS THE



Dams  
on the  
Side

# ON SIDE

I kick off my sparkly flip-flops and slip my feet into the trusty ol' black rubber boots, pulling them over my jeans. "Every good woman should have a pair of black rubber boots in her trunk," I say to the trio of Brazos River Authority guys — John Hofmann, John Dickson and David Wheelock. They have brought me out to Allers Creek, the site of a proposed off-channel reservoir, and the ground remains muddy and wet after recent rains.

We head through brush, cedar elm and hackberry trees, on down to the creek. Thick poison ivy vines wind around large trees, and as we get nearer, a couple of turtles plunk into the creek from its banks. Allers Creek flows muddy brown, its water roiling and swirling around submerged tree limbs.

"That is a ginormous oak," says Hofmann, as we gaze up at its gnarled and thick trunk. Hofmann works as manager of the central

and lower basins of the Brazos; and Allens Creek flows into the lower basin of the Brazos, 133 miles upstream from the Gulf of Mexico and west of Houston.

“Will the tree get drowned by the reservoir?” I ask. “I’m worried about the tree.”

They orient me with an aerial map. We stand just a quarter of a mile upstream of the confluence of Allens Creek with the Brazos, and just outside where the levee will get constructed. The earthen levee across Allens Creek will create an off-channel reservoir that will flood roughly 9,500 acres of

land — mostly farm fields. Once fully approved, the reservoir will most likely get built around 2018. And the huge oak tree is safe.

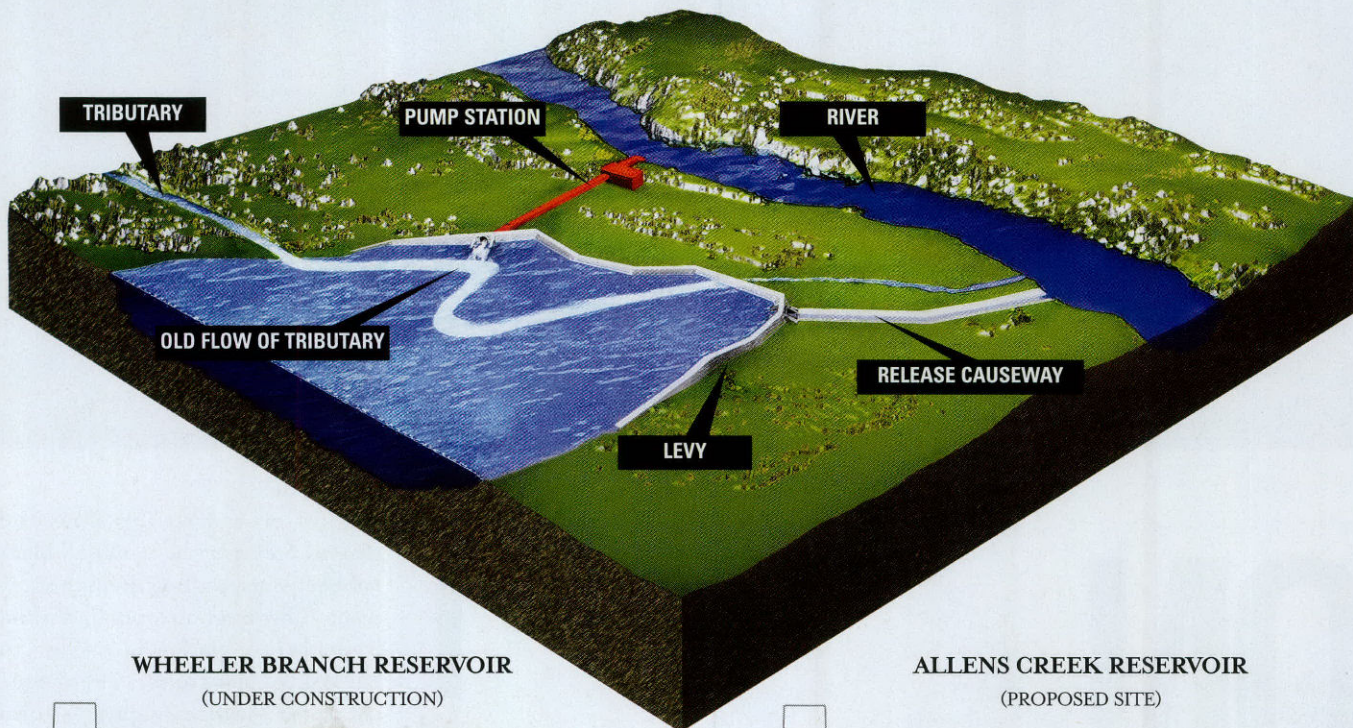
Off-channel reservoirs have become a popular option for Texas water planning, and have been lauded as less ecologically harmful alternatives to traditional on-river reservoirs. Not only are most off-channel reservoirs smaller in total size, they should cause fewer impacts to aquatic life in the main river. However, they are not without impact.

“In general, TPWD prefers off-channel reservoirs to new, on-chan-

nel reservoirs because the impacts to fish and wildlife are less,” explains Cindy Loeffler, TPWD Water Resources Branch Chief. “Impacts to aquatic ecosystems — rivers, streams, bays and estuaries — are less since not all flow is impounded, as is the case with an on-channel reservoir.”

Traditional reservoirs dam up a river’s main channel. This prevents fish and aquatic critters from migrating downstream and changes a river’s natural dynamics. A dam also keeps much-needed fresh water and sediment from flowing downstream, where

## ANATOMY OF AN OFF-CHANNEL RESERVOIR



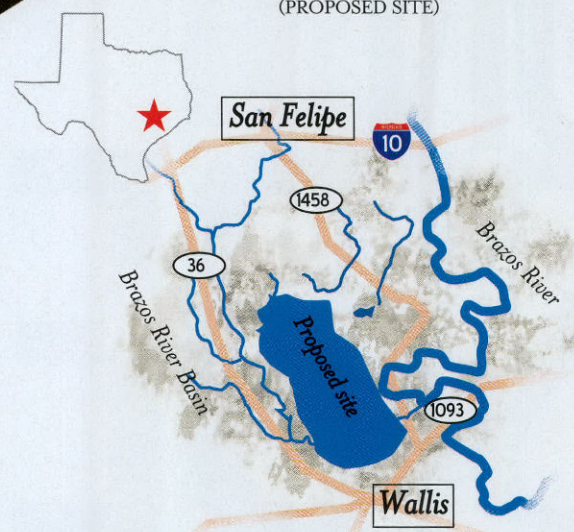
WHEELER BRANCH RESERVOIR

(UNDER CONSTRUCTION)



ALLENS CREEK RESERVOIR

(PROPOSED SITE)



Right: The original site of the Allens Creek Reservoir, Alligator Hole, will now be preserved, as the plan has been altered to save the wetland. Bottom: The proposed site for the off-channel reservoir on Allens Creek.

they would otherwise reach the estuary at a river's mouth.

In contrast, an off-channel reservoir requires building a dam or levee on a tributary — a smaller creek, stream, bayou or branch that flows into the larger river. To keep such a reservoir filled to capacity, water must be pumped in from the main river, because tributaries do not typically have enough water volume flowing through them on their own.

Since Senate Bill 1 passed the Texas legislature in 1997, 16 regional groups have started planning for the next 50 years of Texas' water, and the Allens Creek reservoir is one of the recommended strategies in the 2006 Region H water plan — the region that includes Houston. It will provide future drinking water for the Bayou City, as well as water for agriculture, industry and other uses. Even though Allens Creek is an off-channel reservoir, it will provide approximately two-thirds the yield of the highly controversial proposed Fas-trill reservoir in East Texas, and rather than destroying ecologically valuable and rapidly disappearing bottomland hardwood forests, it will mostly inundate old farm fields.

As we walk away from Allens Creek I reach down and pick one of the spring's early wildflowers. "Are there wetlands that will be destroyed by the reservoir?" I ask. Dickson tells me that the initial reservoir construction plan would have inundated hundreds of acres of high-quality wetlands in a spot called Alligator Hole. A revised plan shifted the reservoir's location, preserving the wetland. "Can we see it?" I ask.

We drive to Alligator Hole a few miles away. Then only Dickson and I brave the long muddy trudge in our boots to the wetland — a seasonally flooded forest that happens to have about a foot of water at the moment. I laugh at the mud on Dickson's boot, which looks like a large tree gall. As we walk around, we discuss how few kids get outside on a





Off-channel reservoirs can provide water for drinking, industry, and irrigation with less impact.

regular basis to appreciate nature like this — mud bugs, trees, birds, bees and all of it. He recently took his preteen daughter's friend fishing; she had never been. I lament how my own daughter does not have a passion for the outdoors like I do. If the renowned Harvard entomologist E.O. Wilson never outgrew his "bug phase," well then I never outgrew my mud phase. I love to tromp around in my big black boots.

Modifying the original plan to preserve this wetland — ecologically valuable habitat that people once considered nuisance, not splendor — is one way that the Allens Creek project stands as a positive example of collaborative planning. On top of that, the Brazos River Authority has incorporated measures to minimize the reservoir's impacts on the aquatic ecosystem. Nonetheless, any change in a river system's structure can alter ecological function.

"[The planned reservoir] still is impacting aquatic habitat on a major tributary in the lower Brazos," says Kevin Mayes, TPWD aquatic biologist who consulted with the Brazos River Authority in developing the Texas Commission on Environmental Quality water rights permit, "so there could be important functions in that tributary that are lost because the dam proposed is fairly close to the confluence with the Brazos."

Tributaries provide refuges for fish and other aquatic organisms when conditions in the main river are not favorable, Mayes explains. "Aquatic organisms can use tributaries to avoid those

harsh conditions due to flooding or low water or poor water quality. So that's one thing that might be lost if they were to impound Allens Creek."

The permit granted by TCEQ for the Allens Creek reservoir specifies values for low and normal river flows needed for the Brazos River to maintain its natural state of affairs. Rivers, after all, wax and wane as drought and flood cycle through the years. The Brazos River Authority will only be able to pump water from the Brazos if enough remains in the river to meet the water needs both for a healthy aquatic ecosystem and for downstream water users. "It's a significant step forward," says Hofmann, adding that it's one of the first reservoir permits to pass through TCEQ since the 1980s.

Although the Allens Creek off-channel reservoir is not yet a surefire thing — public meetings have to take place and some permits need to be secured — the collaborative effort should pay off. Because "everybody's at the table," says Mayes, "maybe, just maybe, there won't be any surprises at the end."

The Allens Creek reservoir history stands in stark contrast to the heated controversy over proposed reservoirs in East Texas, particularly Marvin Nichols and Fastrill. The reservoirs would provide water for Region C — which includes Dallas and Fort Worth — but in the process will dam up rivers and submerge thousands of acres of bottomland hardwood forest.

Region C has some of the highest per

capita water use, which it projects on into the future rather than reducing water waste with effective conservation planning. A National Wildlife Federation study entitled "Save Water, Save Rivers, Save Money: The Potential of Municipal Water Conservation in Texas" found that if the City of Dallas alone decreased its per-person water use by 1 percent per year over 60 years, the city could save roughly twice as much as the Fastrill reservoir would provide — conserving more than 200,000 acre-feet of water per year. The achievement is not far-fetched. Water conservation efforts enabled both San Antonio and El Paso to decrease water use by 30 percent in less than 20 years.

On the other hand, Region H, which includes Houston, has embraced tactics such as advanced water conservation, drought planning, brush management, naming ecologically unique streams, and off-channel rather than new on-channel reservoirs.

Although intensive water conservation has yet to begin here, it will include improving the efficiency of agricultural irrigation, conservation in private residences and businesses, and brush control for private land.

Within and outside Region H, Allens Creek is not the only off-channel reservoir being considered. In the second phase of water planning, Region H substituted an off-channel for an originally planned on-channel Little River reservoir as an alternative water supply tactic. And in Region G, in north Texas, the Wheeler's Branch off-channel reservoir southwest of Fort Worth nears completion.

Sixty miles southwest of Fort Worth, I've donned my black rubber boots again, ready to see another off-channel reservoir site — Wheeler's Branch, a tributary of the Paluxy River.

As we drive through this Cross Timbers region of Texas, with its rolling hills and scattered live oaks, I tell my two kids that the singer Jewel lives around here, on a ranch in Stephenville with her boyfriend, rodeo champ Ty Murray. I put in her latest CD and listen to the song *Stephenville*: "I'm trying to listen to the leaves speak/ Trying to steal

secrets from fishes in the creek/ Trying to figure out who I am." I bet she's a woman not averse to tromping through mud in a pair of black rubber boots.

The Paluxy River flows into the Brazos, and the Brazos River Authority transferred a 2,000 acre-feet per year water rights permit to Somervell County Water District in 2000. The off-channel Wheeler's Branch reservoir was designed as an alternative to the originally planned on-channel Paluxy Reservoir, after a state court overturned its construction permit.

Kevin Taylor, SCWD general manager, drives me out to see this off-channel reservoir, which is still under construction. We walk through some mud and overlook the basin, which nears completion. Before long this will be filled

with water pumped from the Paluxy as well as natural flow from its tributary, Wheeler's Branch. The reservoir will provide water for irrigation, industry and drinking in Somervell County and the towns within. At only 169 acres of surface area, the impoundment will be 100-fold smaller than the proposed Allens Creek reservoir, but the water will provide the county enough water for the foreseeable future.

The Wheeler's Branch and the larger Allens Creek off-channel reservoirs were planned with TPWD's input, and that of other stakeholders. They stand as examples of collaborative efforts providing more environmentally friendly solutions. However, off-channel or on, each reservoir is unique, and its benefits should be weighed against costs.

Janice Bezanson with the Texas Conservation Alliance (formerly the Texas Committee on Natural Resources) says, "We are opposed to all unneeded reservoirs or reservoirs for which there is an economically feasible lower-impact alternative."

"Off-channels aren't magic bullets to solving our water problems," says Mayes. They do provide water supply while causing less environmental damage than a larger on-channel reservoir. Combined with water conservation, water reuse and other low-cost water supply options, off-channel reservoirs provide a step in the right direction — a direction that helps meet the needs of people while minimizing impacts on the environment. And that, after all, is a step toward sustainability. ★



An off-channel reservoir, like this one constructed off the Snake River in Minnesota, requires building a dam or levee on a tributary that flows into a larger river. While Texas' proposed projects are intended to help satisfy ever-increasing water needs, the Snake River Watershed Project will protect nearby towns by diverting floodwaters into the off-channel reservoir. With the sometimes meager volume of tributaries in Texas, water will be pumped from the main river into the reservoir to supplement the natural flow.



By Henry Chappell  
Photography by Russell Graves

# WATER OR

**PROPOSED MARVIN NICHOLS  
RESERVOIR WOULD SUBMERGE  
HARDWOOD BOTTOMLAND  
TO PROVIDE WATER FOR THE  
DALLAS/FORT WORTH AREA.**

**T**he Sulphur River rises where Delta, Hopkins, Franklin, Lamar and Red River counties meet at the junction of the North and South Sulphur. Here, blackland prairie officially changes to post oak savannah, though a thoughtful observer may notice another transition.

Bending north and then east, winding through bottomlands covered in white oak, pecan, hickory and ash, the Sulphur leaves behind what might be called the beginnings of the West to nourish a culture and landscape that belong to the South.

Here, in the 1840s, pioneers found a well-watered and timbered country that no doubt reminded them of their old homes. Today, many of their descendants still live on the land, raising livestock, logging, hunting and fishing.

Any native of Kentucky or Tennessee will instantly recognize the local lilt and dialect. The small, tight-knit communities share a long history of struggle, from Civil War violence and dissent through



# WOODS?

ecological and economic calamity caused by outside forces and, at times, the fight to survive and prosper.

Like most rural areas, the Sulphur country has its local rifts and grudges, some of them old and deep. But on one issue, many residents of Omaha and De Kalb, Naples and other small communities near the river are uniting. It is an issue that joins farmers, loggers, hunters, real estate agents, the Sierra Club and Texas Conservation Alliance (formerly the Texas Committee on Natural Resources) against urban planners and leaders trying to ensure the continued economic growth of their own region.

The issue is water. Northeast Texas has it in relative abundance. The drier urban and suburban Dallas-Fort Worth area, many believe, may run out of it. Some also argue that the Dallas region's economic contribution to Texas gives them a right to it.

If the proposed project is completed, 67,000 acres of hardwood bottomland, all of it private property, will be taken under eminent domain and submerged beneath a reservoir that will supply water to a growing Metroplex.

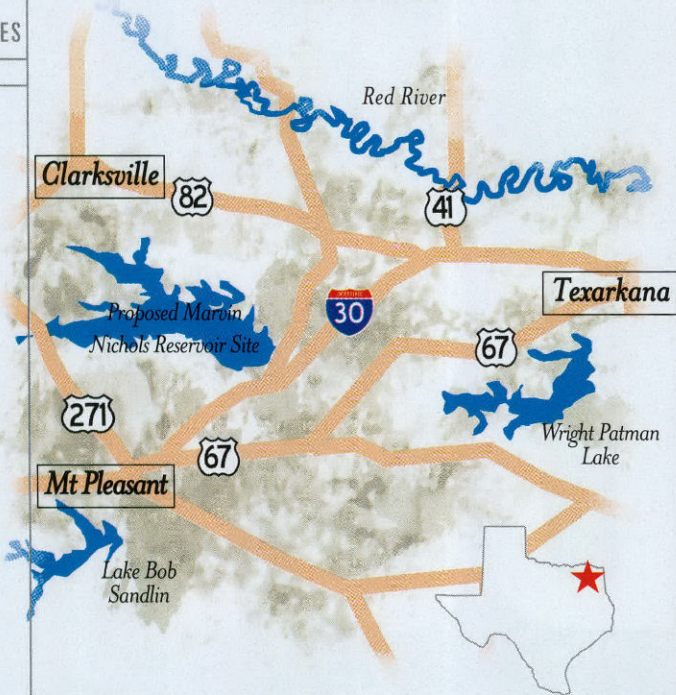
By law, additional lands — as much as 163,500 acres by some estimates — could be set aside to mitigate the loss of high-quality wildlife habitat.

Engineers have identified three potential sites, two on the Sulphur River and one on White Oak Creek, a tributary of the Sulphur.

Max Shumake, alleged “radical environmentalist,” founder and unofficial leader of local grassroots opposition to Marvin Nichols Reservoir, showed up for lunch at the Diamond J. Grill, wearing clashing camouflage pants, T-shirt and cap. No one seemed to notice.

Shumake’s roots in the Sulphur River country go back five generations. His sister Shirley lives in the family home place, a dog-trot, board and bat house built around 1910 by their grandfather, Alfred Latimer Shumake.

**PROPOSED MARVIN NICHOLS  
RESERVOIR SITE**



They could lose several hundred acres to the reservoir.

In 2002, the brother and sister formed the Sulphur River Oversight Society (SOS), a group of local landowners, business people and activists dedicated to fighting the reservoir project.

Between bites of cheeseburger, Shumake said, “I told Shirley we could fight this thing and they might still end up building a lake. But if we don’t fight it, they’ll build a lake for sure.”

Shumake lobbied neighbors, friends, anyone who’d listen. Texas Conservation Alliance, National Wildlife Federation and the Sierra Club offered organizational and public relations support. By 2005, a few e-mails and phone calls would pack a public meeting or senate conference room with well-informed SOS members.

“We’ve had our differences around here, but this fight has brought family, friends and community back together,” Shumake said.

In response to the 1954–56 “drought of record,” the Texas Legislature created the Texas Water Development

Board and voters approved a constitutional amendment authorizing issuance of \$200 million in bonds to fund water development.

For the first 40 years of TWDB’s existence, water planning was a top-down affair. Agencies took a broad view of water needs and proposed solutions, primarily reservoirs. In 1950, Texas had 66 major reservoirs. By 1998, there were 196.

In 1997, after another year-long drought, the 75th Legislature passed Senate Bill 1, which designated 16 regional groups to plan for the state’s water needs over the next 50 years. Plans are updated on a five-year basis and submitted to the Water Development Board for approval and inclusion in the State Water Plan.

In theory, this approach fosters grassroots water planning. Each regional group, composed of about 20 members representing the region’s stakeholders — agriculture, business, water development, industry, environmental and others — ensures that their region’s needs are met and their resources are protected.

Critics contend that some of the planning groups are self-electing boards dominated by representatives of water and urban business interests with little regard for rural and environmental concerns.

The Region C Water Planning Area includes 16 North Texas Counties, with Dallas–Fort Worth at its center. The Region D Water Planning area is largely rural and encompasses all or parts of 19 counties in Northeast Texas, including the proposed Marvin Nichols Reservoir sites.

In its 2006 Water Plan, the Region C Planning Group recommended construction of the reservoir as a water management strategy to be implemented by 2030.

The Region D Planning Group did not. Their plan states that in recommending construction of the reservoir, Region C fails to adequately protect the state’s water, agricultural and natural resources.

Therein lies the heart of the conflict; and it’s not merely a fight between preservationists who oppose dams on principle and water developers who want to build reservoirs. Rather, it’s a battle over whether or not a region’s right to protect its own resources — including wildlife, rural communities, local culture and economy — should be secondary to urban interests.

Region C planners have good reason to be worried about water. Planners believe the region’s population could grow 98 percent, to over 13 million, by 2060.

According to a 2004 Texas Water Development Board survey, Dallas had an average water use of 238 gallons per capita per day (GPCD) compared to the statewide average of 173 GPCD. Some of the suburbs used even more. In contrast, San Antonio boasts an average of 140 GPCD. The 2007 State Water Plan projects the GPCD for Dallas will increase to 256 gallons per person per day by 2060.

National Wildlife Federation calculations, which compare winter consumption to peak summer consumption, indicate that during the height of summer, as much as 55 percent of Dallas’ water goes for outside use — swimming pools, lawns and landscaping.



Water or  
Woods?

Cole Shumake leans against a post oak tree growing along the Sulphur River. His family, which goes back five generations here, could lose several hundred acres to the proposed Marvin Nichols Reservoir.



This headstone could be submerged if the Marvin Nichols Reservoir is constructed.

The 2006 Region C Water Plan estimates that the region used 1.4 million acre-feet of water in 2000 and, accounting for growth, will need 3.3 million acre-feet in 2060.

The plan's \$13.2 billion strategy calls for three new impoundments in addition to Marvin Nichols: Fastrill Reservoir on the Neches River in Anderson and Cherokee Counties, Lower Bois d'Arc Creek Reservoir in Fannin County, and Ralph Hall Lake on the Sulphur River in Fannin County.

Including currently available supplies, conservation measures and connection to existing supplies, the plan provides 4.1 million acre-feet per year — about 20 percent more than the projected 2060 need. While this overage provides a safety margin against unexpected population growth and unprecedented drought, it's also roughly equivalent to the amount of water that would be provided by the four new reservoirs.

According to investigations by Texas Conservation Alliance, Lake Wright Patman, located downstream from the proposed Marvin Nichols Reservoir site, could supply an additional 300,000 to 500,000 acre-feet per year if some of its flood storage capacity were allocated to water supply.

TCA also believes that Lake Texoma, on the Texas-Oklahoma border, could provide Region C an additional 800,000 acre-feet per year. Though some desalination would be required, a study by Austin firm HDR Engineering concluded that, given the lake's proximity to the Dallas area and even with the high price of pipelines, the process could be achieved at a cost comparable to or less than construction of another big reservoir.

Likewise, according to TCA, Toledo Bend and Sam Rayburn could provide hundreds of thousands more acre-feet of water than the amounts allocated to those reservoirs in the Region C Plan. With desalination, the Brazos River could provide a few hundred thousand acre-feet to the Fort Worth suburbs.

Janice Bezanson, executive director of TCA is quick to point out that Region C planners assumed an average water use of 197 GPCD when calculating future needs. "Even the most trivial conservation effort will get the Metroplex well below that," she says.

Jim Parks, executive director of North Texas Municipal Water District and chairman of the Region C Planning Group, agrees that conservation is key to any responsible water strategy but doubts that conservation alone will be enough.

"If we're going to double our population, we need all the conservation strategies we can get people to comply with voluntarily," he says. "I'm being asked to plan for conservation, but I have no authority to make it occur."

Although he agrees that Wright Patman and other reservoirs could supply additional water, Parks believes that maintaining lakes at near flood level could damage surrounding upland habitat and impact stream flows.

And he remains unconvinced that desalination of large quantities of Lake Texoma water is a viable approach at present. "We're constantly looking at it," he says. "If somebody gets it figured out, I need to be talking to him."

Marvin Nichols Reservoir does have supporters in Northeast Texas. Tommy Spruill, executive director of Titus County Freshwater Supply District I, believes his region needs the additional water. "All of our water is currently under contract," he says. "We have enough to maintain status quo, but

we're growing, and when some industry wants to move in and needs several thousand acre-feet of water, we don't have it. We could do something on our own, but why would we want to do that if somebody else is willing to pay the full cost of building a lake?"

According to Rollin MacRae, TPWD's Wetland Conservation Program team leader, Texas had lost 63 percent of its hardwood bottomlands to logging, reservoir construction and other activities by 1980.

"When we're looking at impacts from large projects such as reservoirs, we consider any bottomland in East Texas threatened," MacRae says.

Theoretically, the wildlife habitat loss caused by Marvin Nichols Reservoir would be mitigated by acquisition of a greater amount of high-quality habitat, which would then be managed and protected. But Tom Cloud, a field supervisor with the U.S. Fish & Wildlife Service, doubts there will be enough bottomland left in the Sulphur River basin.

"If we can't find it there, we'll just keep moving out," he says. "It's going to be extremely hard to find anything of this magnitude and quality."

Most likely, mitigation will be accomplished by acquiring and intensively managing a much greater amount of lower-quality habitat. As an example, the Corps of Engineers mitigated wildlife habitat loss from construction of 23,000-acre Jim Chapman Lake (formerly Cooper Lake) by acquiring 40,000 acres of private property — lands that now make up Cooper and White Oak Creek Wildlife Management Areas.

Except for military service during World War II, bachelor brothers Seaby and Olen Love — the Love boys — have lived their lives hunting, fishing, trapping, logging and running stock in the Sulphur River basin. They could lose their farm to Marvin Nichols Reservoir.

I sat with them in their living room as the late-afternoon sun lighted walls paneled by wood the boys cut in the river bottom. Seaby, the younger of the two, did most of the talking. Olen added sparse commentary, mostly for emphasis.

"I've never drawn a check and never worked at a public job," Seaby said. "But we've caught a right smart number of coons, and cut some timber, and one year we raised 700 hogs."

"It's all we know to do," Olen said. He nodded out the front door. "Our mother and daddy are buried right over here in this graveyard, and that's where we want to be buried. This reservoir will be the ruination of this country."

Ruination might be a little hard to mitigate.

## Details

Texas Water Development Board, <[www.twdb.state.tx.us](http://www.twdb.state.tx.us)>

Region C Water Planning Group, <[www.regioncwater.org](http://www.regioncwater.org)>

Sulphur River Basin Authority, <[www.sulphurriverbasinauthority.org](http://www.sulphurriverbasinauthority.org)>

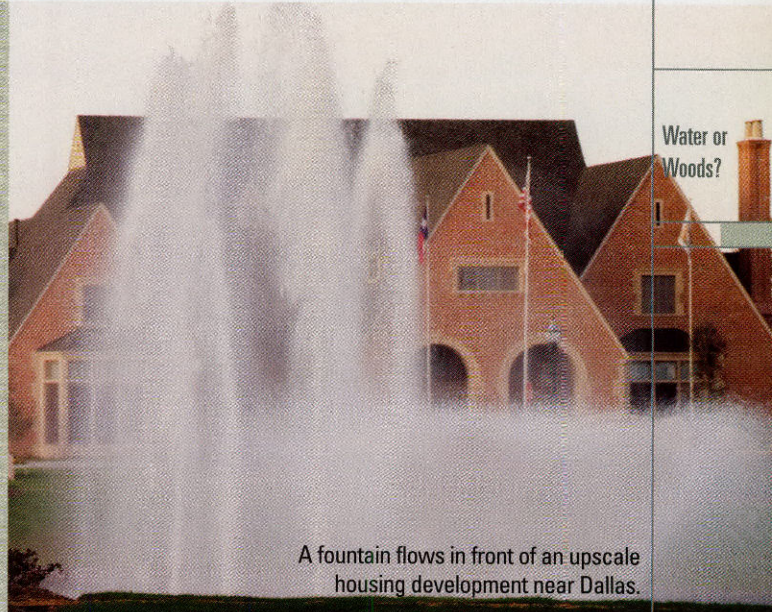
Northeast Texas Water Coalition, <[www.waterfortomorrow.org/mision.htm](http://www.waterfortomorrow.org/mision.htm)>

Texas Conservation Alliance (formerly the Texas Committee on Natural Resources), <[www.tconr.org](http://www.tconr.org)>

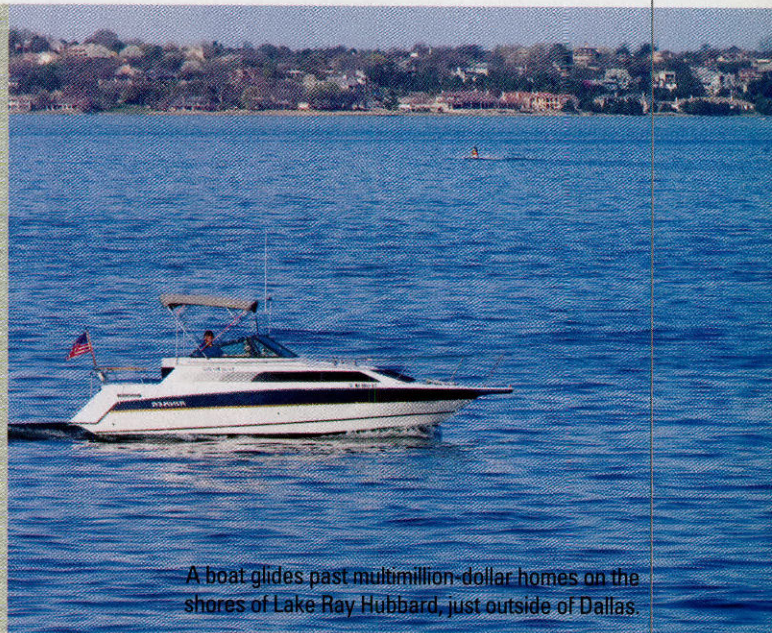
National Wildlife Federation, <[www.nwf.org](http://www.nwf.org)>

Lone Star Chapter, Sierra Club, <[www.texas.sierraclub.org](http://www.texas.sierraclub.org)>

Historic Sulphur River, <[www.sulphurriver.net](http://www.sulphurriver.net)>



A fountain flows in front of an upscale housing development near Dallas.



A boat glides past multimillion-dollar homes on the shores of Lake Ray Hubbard, just outside of Dallas.

Water or Woods?

THE  
STATE  
OF  
LAKES

PHOTO © TONY RYAN

Sailing on Lake Travis



# LAKE LIFE

FROM BIG-BASS MECCA  
TO HOUSEBOAT HEAVEN,  
EACH LAKE IN TEXAS HAS  
A UNIQUE PERSONALITY  
TO CALL ITS OWN.

By Carol Flake Chapman



THE  
STATE  
OF  
LAKES

PHOTO THIS PAGE © WYMAN MEINZER; OPPOSITE LEFT BY EARL NOTTINGHAM/TPWD; RIGHT © TXDOT





**“This is my happiness place,”** says Paul Kisel, park superintendent at Eisenhower State Park. We’re standing on a wooded bluff jutting out on the southeastern edge of Lake Texoma, with the park’s boulder-lined swimming area to the right and a triple-winged fishing inlet called Butterfly Cove to the left. Oklahoma, with whom Texas shares the lake, lies across the way. A major bass tournament has just been completed, and the fancy bass boats are headed for home. The lake’s permanent armadas of sailboats, powerboats and yachts have put in for the day at the park’s Eisenhower Marina and the dozens of other marinas nestled in coves around the lake.

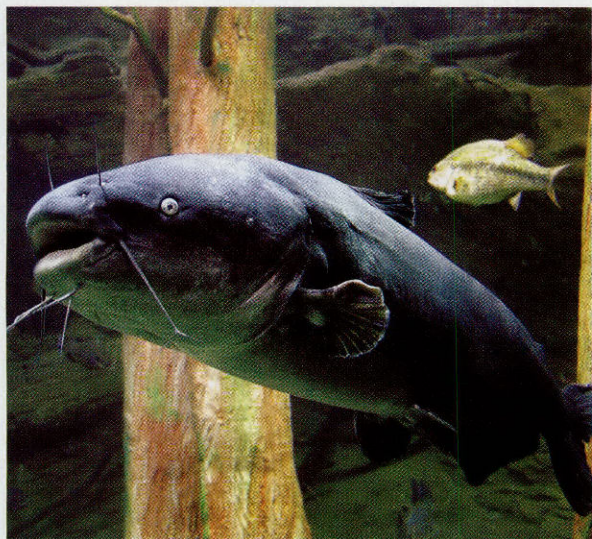
Owners of small aluminum flat-bottomed boats have hoisted them onto trailers, dumped the water from the ice chests and headed for the tents and RVs dotting the park campgrounds, ready to twist the cap on a cold drink and spin yarns about the day’s catch. Texas lakes have been providing happiness places for generations of Texans, and this windy point on the northern edge of the state’s Prairies and Lakes region is a good place to begin a plunge into Texas lake culture. Lake, of course, is a term we use loosely in Texas. When we refer to lakes, we’re usually talking about rivers that have been harnessed into reservoirs for flood control, water supplies or power generation. There are close to 200 major man-made reservoirs in Texas, and only one major “naturally” formed lake, though even that one, Caddo, only dates back a couple of centuries or so. And yet our “lakes” have become so much a part of our landscape and our history—and our way of life—that you could swear they’ve always been here.

Who can imagine a time before you could catch lunkers in Lake Fork, tack across Texoma or party hearty on Lake Travis?

### Stripers and clear sailing on Lake Texoma

Texoma is one of the state’s many “border” lakes — since rivers often define borders, it’s not surprising that Texas has so many lakes that straddle boundaries. The dividing line between Texas and Oklahoma runs right through Lake Texoma, along the original course of the Red River. The Texas side has bluffs (making it less vulnerable to fluctuating river levels) and reddish sand, while the Oklahoma shores tend to be flatter. Although there are no blinking markers in the middle of the lake telling you when you’ve left Texas, you’ll need an Oklahoma fishing license once you hit Oklahoma water — a remnant of old border wars, observes Paul Kisel. Texoma, at more than 89,000 acres, is big enough to support several different kinds of lake people, from Dallas socialites and

Left: A solitary fisherman. This page, left: Splash, the Texas state record blue catfish, who lived at the Texas Freshwater Fisheries Center in Athens until its death in 2005. Far right: Sailing on Lake Texoma.





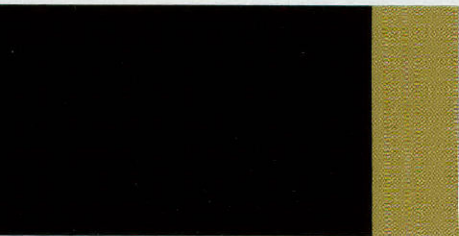
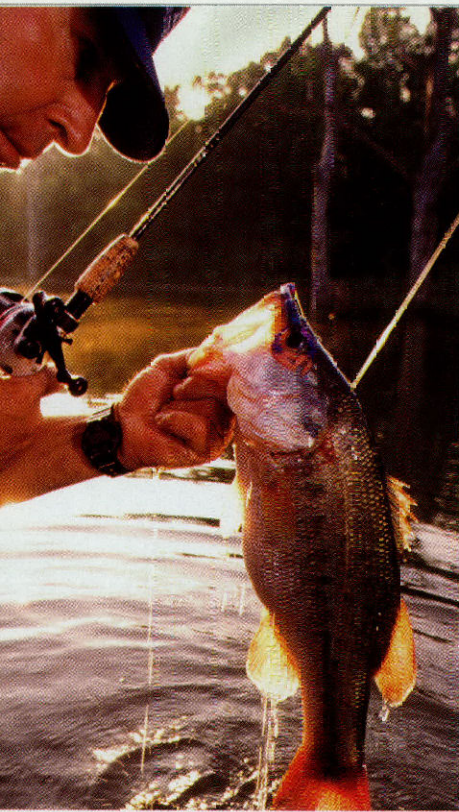
Wakeboarding on Lake O' the Pines



THERE'S A KIND OF LAKE ETIQUETTE THAT HAS BEEN ESTABLISHED ON THE LAKE BY YEARS OF TRIAL AND ERROR. THERE ARE DOS AND DON'TS, INCLUDING NOT KEEPING YOUR BASS FOR BRAGGING RIGHTS AND NOT DOUSING FOLKS IN SMALL BOATS WITH YOUR WAKE AS YOU ZOOM BY IN YOUR 21-FOOT TRITON.



Lake Fork



celebrities enjoying the scenic backdrop for their decorator yachts to professional anglers looking to hook a record striper and locals plying the coves to check their trotlines for blue cats.

Texoma, in fact, is famous for the size of its blue cats, including the late former world record-holder Splash, caught from a bank, which wowed the visitors at the Texas Freshwater Fisheries Center in Athens. What's more, Texoma is the only Texas lake where striped bass spawn, and according to Kisel, the water can sometimes appear to be boiling with them. If you stop at a gas station or convenience store near the lake, you'll probably find T-shirts sporting the motto "Hook 'em" (not referring to the University of Texas football team) and vats full of live bait swimming around, including waterdogs, which are good to "hit the bass on the head," as one store owner told me, when they're distracted by spawning.

You can almost always catch a breeze at Texoma, and the strong winds that roar down from the north, which can turn the lake's waters into ocean-like chop, are a boon to the lake's many sailing aficionados. Texoma sailboaters form perhaps the most tight-knit sporting community on the lake. The Texoma Sailing Club, which sails out of the Grandpappy Point Marina, just down the shore from Eisenhower Park, has more than a hundred member families. Many of them are from the Dallas-Fort Worth area, with associate memberships for people who crew for the boats. The club holds countless races, and according to club commodore Vicki Maxcy, it's built around the racing program. "Sailboat people tend to be fairly competitive people," says Maxcy, who lives in McKinney and runs a hair salon as her day job. The club also holds plenty of social events, including a Jimmy Buffett night, and helps put on the annual LakeFest Regatta that attracts boats and sailors from around the country.

### Lunker haven at Lake Fork

Just two hours' drive southeast of Texoma, on the edge of the Pineywoods, is Lake Fork, which feels a world away from Texoma. With treetops poking out of the

water, fishing camps lining the banks, and bass boats maneuvering in nearly every cove, Lake Fork appears to be all business — bass business, that is, though catfish and crappies have come on strong, too. According to one study, the fishing business brings in between \$27 to \$28 million a year to the area. Instead of yacht captains or sailing skippers in topsiders, the big wheels here are the bass guides, with decal ads for their boat and motor sponsors emblazoned on their hats, vests and boats. The marinas and motels here tend to be on the basic side, though owners of the bigger bass boats on the lake seem to spare no expense on equipment, with fishing platforms so big and sturdy it's like casting from an oil rig.

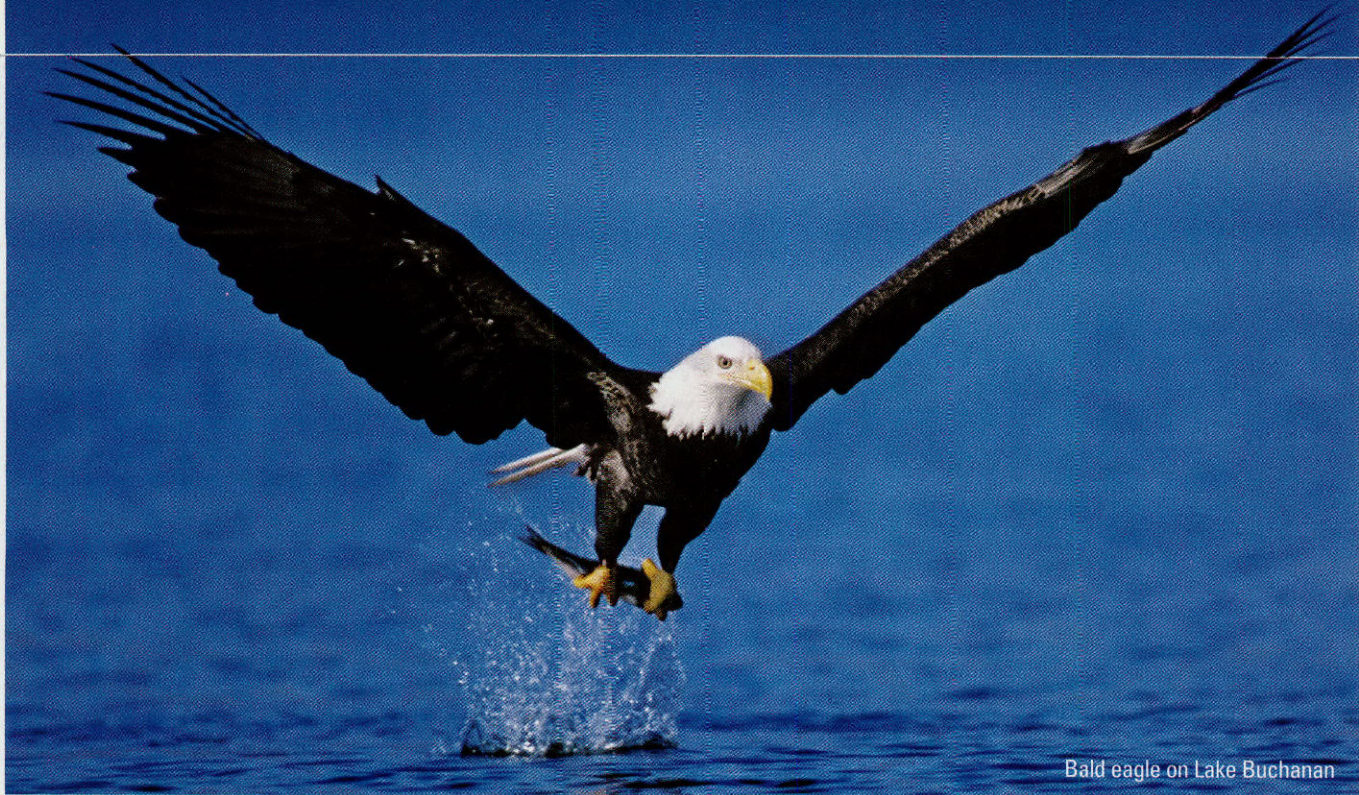
TPWD biologist Kevin Storey says that there are a number of factors that have made Lake Fork the mother lode for trophy largemouth bass. One is the "structure" provided by the trees that were left on the lake bottom when the lake was first filled. Another is the strict slot system (only bass less than 16 or more than 24 inches can be kept) that has evolved into a "catch-and-release mentality," says Storey.

There's a kind of lake etiquette, he says, that has been established on the lake by years of trial and error. "There are dos and don'ts," he says, including not keeping your bass for bragging rights and not dousing folks in small boats with your wake as you zoom by in your 21-foot Triton. There is potential conflict between different resource users, he says, "particularly with new users who didn't grow up on the resource, living and breathing it, and learning from their parents and grandparents."

When I stop for lunch at the Bass Lantern Cafe, which anchors the Minnow Bucket Marina, pickup trucks and bass-boat trailers are everywhere. I'm meeting bass guide Rick Loomis, who has brought in a group from the Midwest for lunch and a respite from the 30 mph winds that have kicked up. He says that in 13 years of guiding, he's never had a client ask to keep a fish. "Lake Fork has a mystique," he says, and part of the mystique is "knowing that the 10-pound bass you caught one year will still be there the next, but even bigger."



Catching a bass on Lake Fork



Bald eagle on Lake Buchanan

Lake  
Life

THE EAGLES STILL FLY HIGH OVER BIG, BLUSTERY LAKE BUCHANAN, AND YOU CAN KAYAK YOUR WAY UP A FAIRLY WILD TRIBUTARY TO WATCH THEM ... WHO CAN IMAGINE A TIME BEFORE YOU COULD CATCH LUNKERS IN LAKE FORK, TACK ACROSS TEXOMA, OR PARTY HEARTY ON LAKE TRAVIS?

Fork, he says, is a “bass fishing jewel that has been protected and taken care of.” He admits that there is considerable competition for trophy bass on the lake, although there are fewer tournaments here because of the slot rules. It’s difficult to keep secrets about bait and location — not only from anglers but from the fish. “With 375,000 people coming here every year, and every one of them throwing bait, it doesn’t take long to educate the fish,” he says.

### Jewel of the Highland Lakes

I live a stone’s throw from one of the six Highland Lakes, Lake Austin. With a visible current, my lake still feels more like a river than a lake. If the Colorado were a snake, the Highland Lakes would constitute the series of bulges along its Central Texas coils, as though the Colorado had eaten a seven-course banquet. Each lake, from Lake Buchanan, the top bulge, to

Town Lake (the unofficial seventh Highland Lake), the slender segment at the bottom that runs through downtown Austin, feels remarkably different, though the shoreline surrounding the lakes has been changing rapidly, filling up with luxury houses and resorts.

The eagles still fly over big, blustery Lake Buchanan, and you can kayak your way up a fairly wild tributary to watch them and then relax at the comfortable Canyon of the Eagles resort. Lake Marble Falls is still full of fast speedboats, and Lake Travis still attracts gawpers to clothing-optional Hippie Hollow like sailors to the Lorelei. However, the lake now seems to be surrounded by residents sunning themselves on their docks as boatloads of frolicking college students zoom by, trailed by show-offs on wake boards. Fortunately, there are still plenty of rocky coves at Pace Bend Park where you can swim and splash

around in peace, and you can even camp there with your horses and dogs.

Inks Lake, a tiny jewel of a lake that lies just below Lake Buchanan, seems the most impervious to change of all the Central Texas lakes, partly because so much of its shoreline is owned by TPWD and by the legendary Camp Longhorn, where many a Texan learned how to paddle. Inks Lake State Park, the only state park on the Highland Lakes, is the second most popular camping site among state parks (after Garner), and it’s usually completely booked from March through Thanksgiving. Like Garner, it’s a place where families come for generation after generation. The park’s interpretive ranger, Rob Smith, says that his parents first brought him here as a “diapered baby.”

When I visited this year during spring break, the park was packed. And yet it still felt like the peaceful kingdom, with fami-

OPPOSITE PAGE © DAVID J. SAMIS; THIS PAGE © ROLF NUSSBAUMER

lies and church groups camped next to retirees in RVs, and picnickers spreading out goodies next to impromptu volleyball games. I could hear several different languages being spoken, partly the result of a diversity outreach effort by TPWD. An extended family from India was singing Hindi songs as they loaded into rented canoes at the launch site next to the park store. Kayakers were heading out toward the heron rookery across the lake and up to the Devil's Waterhole and its perfect tiny waterfall, with clear water tumbling over pink granite rocks.

I could see determined anglers chugging toward the Lake Buchanan dam, where folks have been pulling up huge striped bass for years now. Paul Kisel, who served here prior to going to Lake Texoma, says that his mother still owns the record for the largest hybrid bass caught at the lake.

Meanwhile, city dwellers who had never been fishing before were signing up for angler education classes with Janet Bohanan, volunteer fishing event coordinator for the park. "People like having such easy access to the lake and having so much to do when they're here," she says. "It's so relaxed here, but it's also more structured than a lot of lakes, with so many scheduled activities."

### Pursuing bass and a giant panther at Amistad

Perhaps the most unexpected lake in Texas is Amistad, which comes on like a mirage as you drive across the arid Southwest Texas landscape toward the Mexico border. "It can take you aback, this large body of water in the desert," says Greg Garetz, park ranger for the Amistad National Recreation Area. The reservoir is fed by the Pecos, Rio Grande and Devils rivers, three of the most scenic rivers in the state. "The Pecos is our most majestic area," says Garetz.

"It's like going into Yosemite, with these awe-inspiring vistas of hundred-foot cliffs on either side," says Garetz. "We have three different ecosystems coming together here," with elements of the Big Bend and the Chihuahuan Desert to the west, bits of the coastal plains to the east, and remnants of the Edwards Plateau to the north.

The winter Texans, who flock here along with waterfowl, wild turkeys, migratory birds and butterflies, can get the best of three worlds.

The lake only dates back to 1969, when the Amistad Dam was built, creating the 65,000-acre international reservoir. But people have been living and fishing along these waters for some 12,000 years, making Amistad's lake culture among the oldest in the state. When you camp out at Seminole Canyon State Park and Historic Site, you're in good company. For some 300 generations, Native Americans inhabited rock shelters hidden in these canyons, cooking fires that blackened the ceiling of the caves and painting images of shamans and stylized animals racing across smooth rock faces. Seminole and Amistad National Recreation Area actually share the area's most dramatic archaeological site, Panther Cave, with its giant painted panther, which draws visitors by water as well as by land.

Among the newer cultures at the lake is the growing houseboat culture, with visitors coming from around the country to stay at the floating homes away from home that can be rented at the Forever Resort Marina in the Amistad Recreation Area. "We get families that rent more than one boat to fit everybody. We get a lot of business people, too, who come here to relax and enjoy the gorgeous sunsets we have here," says Susan Lively, a manager at Forever.

But an even newer culture has been threatening to dominate the waters, at least during tournament time. As plentiful rainfall has raised the level of the lake, big largemouth bass have become bountiful, and the secret is out. When professional anglers began coming to Amistad for tournaments last year, "they were flabbergasted," says Greg Garetz. "They had never seen so many big fish." Some even decided to buy or build houses near Amistad. The ranchland surrounding the lake is rapidly giving way to subdivisions. Perhaps someday the bass-bedazzled anglers will begin painting their own kind of pictographs for the benefit of succeeding generations, complete with hand gestures indicating the size of the ones that got away. ★



Pictographs at Seminole Canyon State Park

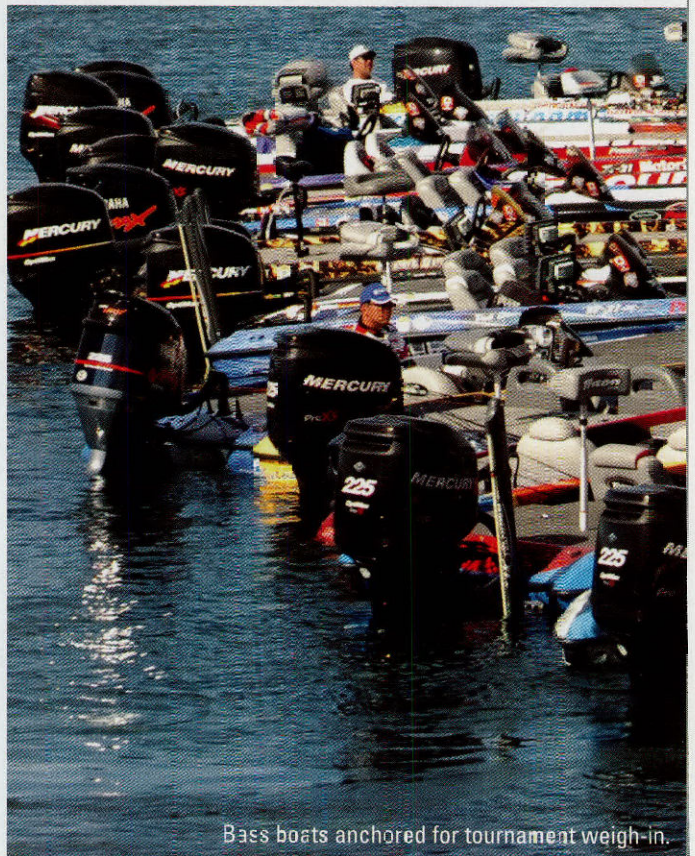


Bass fishing on Lake Fork



Lake Amistad

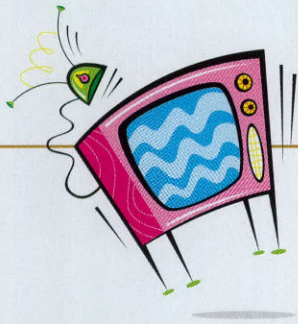
FOR SOME 300 GENERATIONS, NATIVE AMERICANS INHABITED ROCK SHELTERS HIDDEN IN THESE CANYONS, COOKING FIRES THAT BLACKENED THE CEILING OF THE CAVES AND PAINTING IMAGES OF SHAMANS AND STYLIZED ANIMALS RACING ACROSS SMOOTH ROCK FACES.



Bass boats anchored for tournament weigh-in.



# SIGHTS AND SOUNDS



THE FRONT LINE OF NEWS AND VIEWS



## TELEVISION

### LOOK FOR THESE STORIES IN THE COMING WEEKS:

#### July 1 - 8:

Yurt camping at Abilene State Park; new technology for game wardens; Dutch oven cooking; a family of birders; fall colors at Daingerfield State Park.

#### July 8 - 15:

Venomous snakes of Texas; tagging and tracking pintail ducks; McKinney Falls State Park, a capital getaway; misty sunrise in the Hill Country; experienced volunteers.

#### July 15 - 22:

Science and nature at WMAs; flying the Panhandle; finding inspiration in nature; heights of fancy at Davis Mountains State Park; wildlife preservation on private land.

#### July 22 - 29:

Horseback patrols in the Panhandle; restoring the black bear; developing threats to the Katy Prairie; butterflies; the Sam Bell Maxey House.

#### July 29 - August 5:

Focusing on hummingbirds; tubing on the Guadalupe River; Fairfield Lake State Park; a natural wetland water filter; wildlife improves the bottom line.



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**MINEOLA:** KMOO-FM 99.9 / 5:15 p.m.

**ODESSA:** KCRS-AM 550 / 5:50 p.m.;  
KOCV-FM 91.3 / 7:35 a.m.

**PECOS:** KIUN-AM 1400 / 10:30 a.m.

**ROCKDALE:** KRXT-FM 98.5 / 5:04 a.m.,  
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**SAN ANGELO:** KGKL-AM 960 / 6:32  
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**SAN ANTONIO:** KSTX-FM 89.1 / Tues. 2:04  
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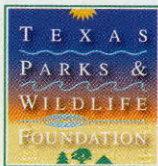
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# PARK PICKS

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## Bonham State Park

Hike, bike and mingle with your fellow campers around a lake with no name.

"I always call it intimate," says Lee Ellis, Bonham State Park's superintendent. The 262-acre park is packed with plenty to do like hiking, biking, camping and boating. He says that the park's size makes people more likely to mingle. "We get lots of repeats," he says. "I get to know the campers. It's a compact little park."

As soon as you enter the park (which is about 60 miles northeast of Dallas), you spot the lake. Don't mistake it for Lake Bonham, though. That's a different body of water just north of town. No, this lake is so special it doesn't even have a name. Ellis says some people call it Bonham State Park Lake, which is appropriate since it's the epicenter of the park.

And at just 65 acres, the lake is small enough to see across but big enough to hold boats. Lake lovers have to keep it under five miles per hour and there are no personal watercrafts allowed. While Ellis says the lake is ideal for kayaks and canoes it's actually not bad for motorized boats since you might be the only one out there. If you do find yourself alone on the lake, you'll have your pick of bass, crappie and catfish.

No need to worry about lake levels at this park. Even though the lake was low last year, it's getting better. "We're in good shape," says Ellis. Regular rainfall as well as the fact that they're not a water source for anybody has helped. Plus, Ellis adds, even when it was low, there was never a problem with silting. "It's such a clean lake," he says.

Many come out to use the clean, no-name lake just for the day. Ellis estimates that 70 percent of his visitors are day use. They mostly drive from the Dallas area and specifically from north of the Metroplex (Frisco, Plano, Allen and McKinney). Their busiest day? The Fourth of July, when he expects to be packed. For those who want to stay overnight, the park has 21 campsites. Keeping with its intimate reputation, the

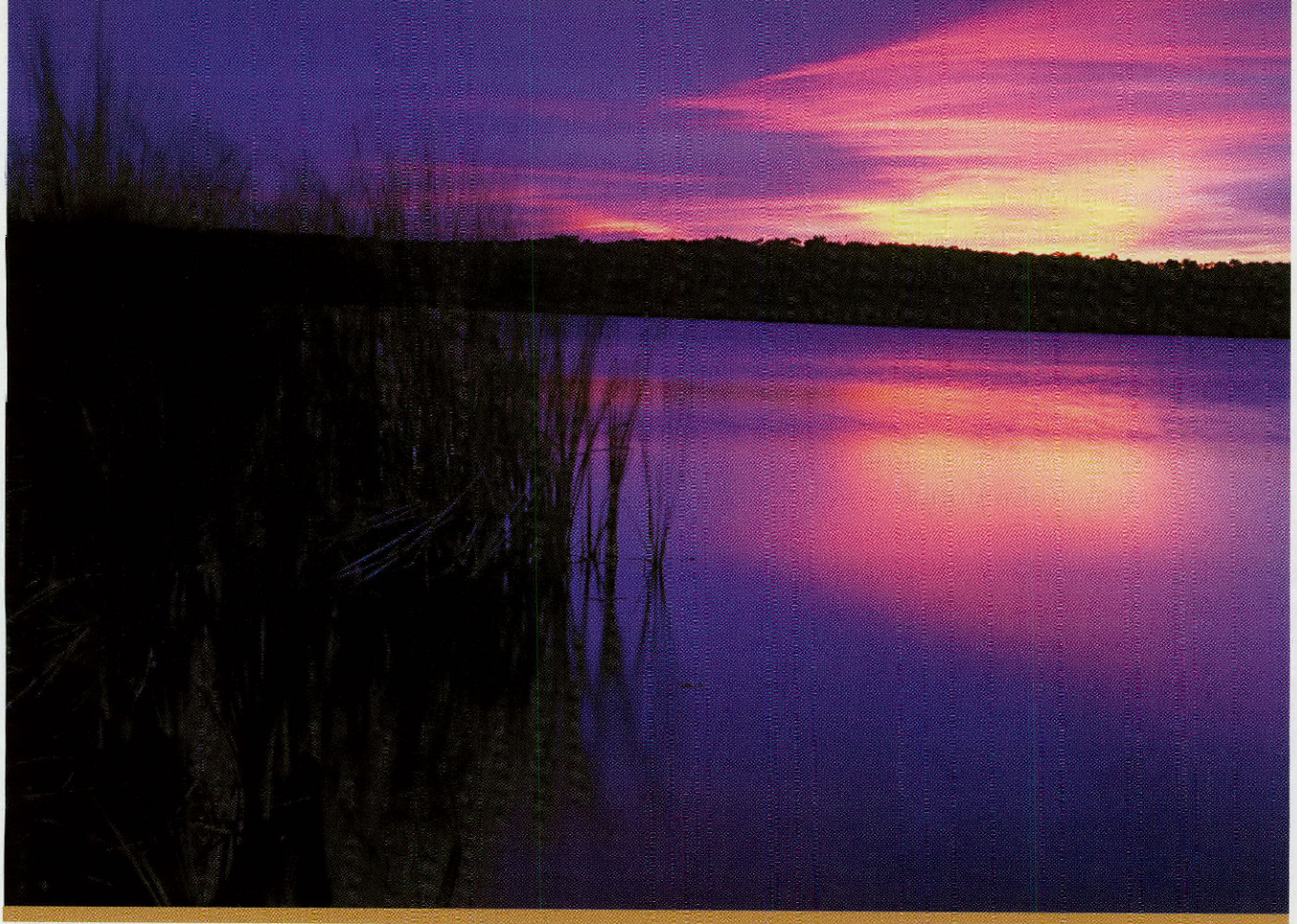
sites form a circle (perfect for social hour).

If you'd prefer to socialize with people you already know, you have to check out their group camping area with barracks. Set behind a private gate, it has five large cabins and a dining hall (which has its own commercial kitchen). With plenty of bunk beds and even a game room, the area can hold up to 94 campers. It's popular with church and Scout groups who love the privacy, the nice accommodations (each cabin has an A/C window unit) and their proximity to the lake and 11 miles of hike and bike trails.

While Bonham's popularity may grow and the lake may rise, Ellis has no plans to change the park's intimate setting. It will always be small, low-key and friendly. As he says, "It's a park you come to to kick back."

For more information call (903) 583-5022 or visit <[www.tpwd.state.tx.us/Bonham](http://www.tpwd.state.tx.us/Bonham)>. ★

—Elsa K. Simcik



## Cooper Lake State Park

Hurry before the crowds discover this northeast Texas haven.

If you make your way to Northeast Texas to visit Cooper Lake State Park, you'll find panoramic views, plenty of bass and deluxe cabins for sleeping. And the best part? You might have this pretty much all to yourself. "It doesn't get that crowded because lots of people don't know about it," says Rodney Franklin, the park's superintendent.

Why the secret? With its opening in the mid-90s, Cooper is a relatively new park. It's made up of two units — South Sulphur (which is a little over 2,000 acres) and Doctor's Creek (about 700 acres). Franklin manages both of them and explains that the secrets don't end there.

"We have the gamut of recreation," he says. This includes a nice beach area where visitors can relax, play or hop in the cool water. The 19,000-plus acre lake is ideal for jet skiing and boating.

That is, when conditions are ideal. And it's no secret that they haven't been for awhile. Cooper Lake like most other lakes in Texas, has suffered from low lake levels — last summer being no exception. The lake can blame its low levels on drought and the fact that it is a water source for Dallas, just about 90 miles away.

While the state of the lake forced Franklin to close the park's boat ramps last year — causing a decrease in visitation — he has higher hopes for this year. Thanks to some good winter rain he's been able to open two of his boat ramps. And that's especially great news for fishermen. The park features a wooded

area just for fishing that makes the bass-catching opportunities even better.

Franklin says that most of their visitors (both to the South Sulphur unit and Doctor's Creek) come just for the day. But for those who do come to spend the night, the park boasts a nice variety of facilities. They've got everything from primitive camping sites to traditional camping sites to equestrian sites. Sure, you have to bring your own horse but each equestrian site includes a 20-foot tether post. There are also 13 miles of trails for four-legged friends. And even if your group consists only of campers with two legs, you can still hike on the five miles of nature trails.

Besides the camp sites, the South Sulphur Unit also features indoor facilities at different levels of luxury. At the top level there are 14 cabins which are as nice as any hotel with the added bonus of lake views. For \$85 per night during peak season you get a living room, bedroom, kitchen and bath plus linens. If you don't need quite all that luxury you can opt for a furnished cottage (at \$45 per night with no linens or bathroom) or the basic screened shelter (for \$25).

No matter if you come for the day or stay for the night (in luxury or otherwise), you might want to hurry to Cooper Lake State Park. With the lake levels looking better they're sure to draw more crowds this summer. Guess that means the secret's out.

For more information call (903) 945-5256 or visit <[www.tpwd.state.tx.us/cooperlake](http://www.tpwd.state.tx.us/cooperlake)>. ★

—Elsa K. Simcik

For information about upcoming events in all your state parks, visit <[www.tpwd.state.tx.us/calendar](http://www.tpwd.state.tx.us/calendar)>.

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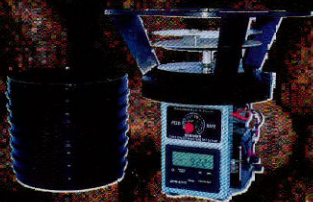
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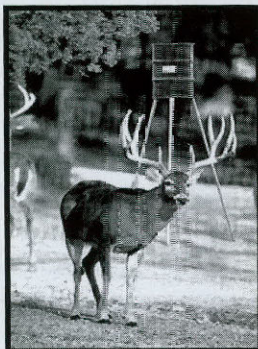
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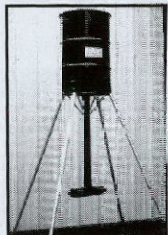


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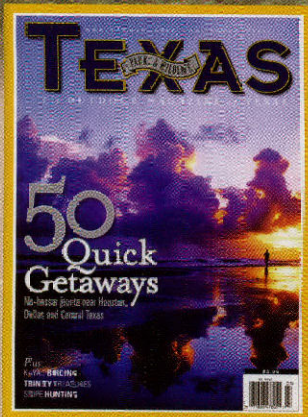
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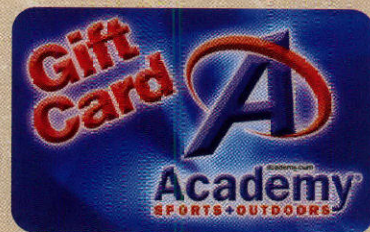
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# PARTINGSHOT

An evening fishing adventure in the shadow of Whitney Dam on Lake Whitney, southwest of Dallas. According to photographer Grady Allen, the trick in this situation is to “meter off” the most dominating aspect of the picture — in this case, the sky or the water, knowing that the man and boy will be silhouetted.

**IMAGE SPECS:**

Nikon F-5 with Nikor 24/85 zoom (set at 50 mm), shutter speed of 1/125 at f/8 on Fuji Velvia 50 ASA.



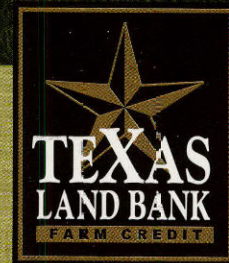


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