# TEXAS PARKS & WILDLIFE

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A Guide to the State Parks of Texas Inside

TEXAS PARKS & WILDLIFE

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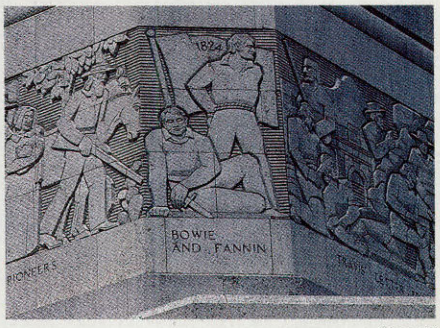


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## Covers

**Front:** This green tree frog is just one of the many wild creatures that will be making frequent appearances in the more than 100 state parks, recreational areas and historic sites this spring. The warmer weather of April and May also brings more campers, hikers, backpackers, anglers and picnickers to the parks. A guide to all the state parks begins following page 16. Photo by Stephan Myers. **Inside Front:** Sights such as this great purple hairstreak butterfly atop a purple coneflower provide proof that spring has indeed arrived. Photo by Paul M. Montgomery.

# A Resource in Peril

*Merlin Tuttle sets the mist net that resulted in the capture of mastiff bats, a species he had tried for years to catch.*

*Mastiff Bat*

# TEXAS BATS

As I lay on my back, scanning the starry sky, I listened intently to the myriad sounds of the desert night. The wind had just died when I heard faint pinging sounds approaching from perhaps a thousand feet or more up the canyon. I held my breath in anticipation, straining to glimpse one of America's least seen animals as it passed overhead. The darkness prevailed, and I saw nothing. Then the sounds circled back, now loud and clear, and the whistle of long narrow wings confirmed my suspicion.

I had finally located a rare western mastiff bat, one of the few bats that uses low-frequency sounds for navigation. These desert giants are by far the largest bats that inhabit the United States. Their wings span 21 inches, but because they are so narrow the bats must drop up to 15 feet just to gain flight. Nursery colonies live in crevices high up on overhanging cliff faces where they are rarely detected by people.

Article and Photos by Merlin D. Tuttle

*Long-nosed Bat*

*Western Pipistrelle*

*Spotted Bat*

Western mastiff bats were once relatively common residents of southwestern deserts, but in the past decade few have been seen, even by researchers. Three years ago, in August of 1986, I set out to find and photograph one. They had last been reported from the Big Bend area of extreme southwestern Texas, triggering my search there.

With the help of friends I combed the desert, both by plane and by foot, spending countless hours searching for isolated water holes near cliffs where mastiffs might roost. These bats must find pools that are large, or at least long and narrow, because they drink while flying at high speed. We set finely threaded mist nets over many water holes, catching and releasing nearly 1,000 bats of 15 species without catching a single mastiff.

Finally, I heard of a remote water hole where a colleague had caught these bats years earlier. To our dismay, the road had long since washed away, forcing us to move tons of rocks and sand in order to enter the area via a mostly dry stream bed. Worse yet, after inflicting serious damage on my four-wheel-drive vehicle, getting stuck multiple times, and working for hours in the 105-degree heat to reach the site, we found that it had been destroyed by a flood.

Not wanting to turn back in defeat, we spotted a distant cliff-walled canyon and pressed on. An hour later, we entered on foot. After three years of failure, I rounded a corner and came upon the ideal mastiff bat pond, 120 feet long by 12 feet wide, far from other water. My cheers echoed through the canyon.

The next evening we set three nets across the pond. To our disappointment the first mastiff passed just over the nets, but then it circled back, this time clearly coming in low enough to drink. My heart pounded as I heard the bat's loud pinging echolocation signals on a collision course with our nets. Moments later, the net stretched several feet as the large bat struck at high speed. In fact, the net stretched so tightly that it failed to catch the bat, which fell into the pond with a loud splash and quickly swam for the far shore. For once, I didn't mind jumping into waist deep water on a cool night! That bat and three more were caught in quick succession, unharmed either by the soft, elastic net or by the swim.

Even after 25 years of studying and photographing some 300 of the world's roughly 950 bat species, I marveled at seeing my first western mastiff bats. Their convoluted faces were set beneath oversized collapsible ears that protruded forward instead of up, reminding me of something prehistoric—perhaps not too farfetched an idea, since relatively modern bats probably occupied Texas more than 50 million years ago. Nevertheless, their inquisitive eyes and gentle dispositions made them immediately likeable.

The western mastiff is just one of 32 kinds of bats found in the state of Texas. Only ten additional species are known from all of the remaining United States and Canada combined. When it comes to bats, Texas is unique. It is not only home of more kinds of bats than any other state, it is also home of the world's largest bat colony, 20 million Mexican free-tailed bats, living in Bracken Cave in Central Texas.

The emergence of Mexican free-tailed bats at dusk is among the most spectacular sights in all of nature. Surprisingly, one such sight can be enjoyed in downtown Austin. Each summer evening, great columns can be

*Pallid bats (right) are not known to take flying prey, preferring instead to catch grasshoppers, crickets, scorpions and centipedes from the ground or foliage.*

*Mexican Free-tailed Bat*

*Huge columns of Mexican free-tailed bats, such as this one in Central Texas, can be seen for miles and may climb more than 10,000 feet above the ground. In addition to controlling night-flying insects, these bats produce some of the world's best fertilizer.*

seen for up to two miles, as the world's largest urban bat colony, approximately 750,000 bats, exits from under the Congress Avenue bridge spanning the Colorado River. These emergences attract people from all over the country and are best viewed from behind the Four Seasons Hotel. The famous Carlsbad Caverns colony in New Mexico is only about one-third as large.

Of course, the primary importance of Texas bats is their invaluable control of night-flying insects, including vast numbers of crop and yard pests. A single mouse-eared bat can catch 600 mosquito-sized insects in an hour, and the bats from three large free-tailed colonies near San Antonio consume up to a million pounds or more of insects each summer night. Such dramatic impact is widespread in Texas. For example, the bats living under the Congress Avenue bridge in Austin eat an estimated 15,000 pounds of insects nightly. Imagine the number of insects contained in a single pound, and then consider what Texas might be like without bats!

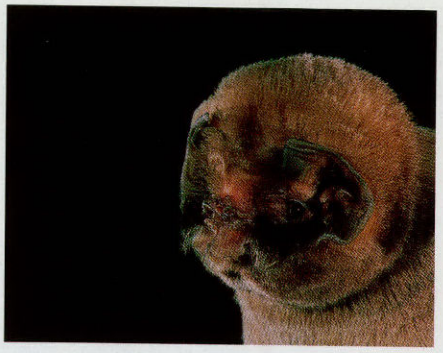
Different kinds of bats have their own unique prey preferences. Mastiff bats appear to feed primarily on a variety of small insects, including flying ants. Big brown bats feed mostly on beetles, while Mexican free-tailed, red and hoary bats prefer moths. The smallest bats, such as pipistrelles and the eight Texas species of mouse-eared bats, are more likely to eat small insects, including mosquitoes. Even some of the largest bats will sometimes feed heavily on mosquitoes when these are especially abundant. Pallid bats are not known to take flying prey, preferring instead to catch grasshoppers, crickets, scorpions and centipedes from the ground or foliage. Each kind of bat plays its own important role in nature's delicate balance.

Long-nosed bats, found in Mexico, southwest Texas, New Mexico and Arizona, are highly specialized for feeding on the nectar of agaves and other desert plants. Their noses and tongues are especially long, allowing them to reach deep into flowers. Some species of agave plants, including those from which tequila is made, are so dependent on these bats for pollination that the odds of successful seed production drop to 1/3000th of normal if they are not visited. In the Sonoran Desert of Arizona and Mexico, organ pipe, saguaro and cardon cacti are also heavily dependent on these bats.

Even though several of the largest bat colonies in Texas are located on protected private ranches, other colonies are clearly declining, and many already have been lost. Wherever bat caves are unprotected and located on lands readily accessible to the public, bats are being disturbed and their numbers are in decline. Caves that I personally have visited in the Austin area have averaged losses in excess of

*Red Bat*

*Southern Yellow Bat*



*Peter's Ghost-faced Bat*

90 percent, probably within the past 20 years. The state's most important colony, in Bracken Cave, is now surrounded by urban development and soon will require major protective action in order to survive.

Long-nosed bats have declined to the extent that a recent report in the U. S. Federal Register (Vol. 53, No. 190, 1988) noted "there is concern for the future of entire southwest desert ecosystems." These bats are now listed as endangered, but only two nursery colonies are known to remain. One of these is from the Big Bend area of Texas. It has declined by an estimated 50 percent in the past 20 years.

A decline in bat populations is caused by a variety of factors, ranging from habitat loss and pesticide poisoning to inadvertent human disturbance of roosts in caves, and intentional destruction. Of these, roost disturbance by amateur cavers and deliberate killing by people who needlessly fear bats are believed to outweigh all others. Many caves are not used by bats and can be explored without harm. Most others are required by bats only in winter for hibernation, or in summer for rearing young. Both can be explored during periods of bat absence. Local chapters of the National Speleological Society can be consulted for advice about specific caves.

A single, brief human visit to a cave where bats are hibernating can cost the bats 10 to 30 days' worth of stored fat reserves, and repeated visits can cause them to starve before spring. Disturbance of nursery colonies in summer leads to high juvenile mortality and abandonment of key roosts. The bats often have few other roosts available and do not survive.

Some large Texas colonies have been destroyed through cave commercialization. Other caves are permanently closed by owners who fear liability problems from people who might get hurt during exploration. When our Mexican free-tailed bats migrate south for the winter they encounter equally

## *They carry the seeds of the world's survival . . . and they need your help*

Forget those horror movies and horror stories.

The truth about bats is they're clean, intelligent mammals that are responsible for controlling vast numbers of insects, pollinating many of the world's most valuable plants and for 95 percent of the seed dispersal essential to the regeneration of tropical rain forests. Without rain forests, the world's entire ecological balance would be destroyed.

Due to people's fears and misconceptions, however, bats are being randomly and brutally exterminated. Many valuable species are endangered or already extinct.

Bat Conservation International was founded to educate people worldwide about these useful creatures. In Texas, Bat Conservation International has been instrumental in saving many of the largest bat colonies in the state. Much more needs to be done, however. BCI still lacks adequate funding to implement many of its conservation projects.

Please help support BCI by becoming a member and making a donation. The bats' survival—and possibly yours—depends on it.

**_____ Yes, I wish to become a member of Bat Conservation International**

**As a member of BCI, you will receive our quarterly publication, BATS, and a 10 percent discount on all specialty items in our catalogue.**

**Name** _____

**Address** _____

**City** _____ **State** _____ **ZIP** _____

**Mail this coupon with your tax-deductible contribution for $25, $50, $100, $500 or more payable to Bat Conservation International, P. O. Box 162603, Austin, Texas 78716.**

*Evening Bat*

*The unique color pattern of the hoary bat serves as camouflage. Hoary bats usually roost beneath the boughs of evergreen trees.*

serious problems from poorly planned vampire bat control efforts. Vampires do not live in the United States, but in Mexico they are known to form small colonies that can harm cattle. Such bats sometimes require control. The problem is that vast colonies of free-tailed bats are much more conspicuous, and their caves are often dynamited or burned, killing millions at a time under the mistaken notion that they are vampires. Five of the nine largest free-tailed colonies known in Mexico have been destroyed in the past two decades.

Concurrent losses in the Southwest are well documented. The famous Carlsbad Caverns colony of freetails had dropped from 8.7 million to 250,000, and the Eagle Creek Cave colony in Arizona plummeted from approximately 30 million in 1963 to a mere 30,000 just six years later. Now the colony of 20 million in Bracken Cave, Texas, is also threatened.

*Townsend's Big-eared Bat*

A major problem faced by bats everywhere is that we humans naturally fear most the creatures we understand least. Bats, being shy and active only at night, are seldom seen except when sick, leading to numerous unfounded fears and extreme intolerance.

Contrary to widely held misconceptions, bats are not blind, they do not become entangled in people's hair and they are no more likely to be sick or dirty than any other animal. It is true that, like many mammals, an occasional bat can contract rabies. But there is little cause for concern if we follow one simple rule—don't try to handle them. Any wild animal that can be caught and handled is more likely than others to be sick and potentially dangerous. It is comforting to know that even the few bats (less than one half of one percent) that contract rabies rarely become aggressive. Current research also has shown that bats, contrary to early fears, do not survive to become symptomless carriers, and they do not serve as reservoirs for outbreaks in other wildlife.

Since World War II, only 15 people are believed to have died of rabies from bats in all the United States and Canada. That's less than the number killed *annually* in the United States alone by dog attacks or from food poisoning contracted at church picnics. In an entire career of working with bats worldwide, I have never seen even one aggressive individual. For those who simply leave bats alone, the odds of being harmed are minuscule. Yet the advantages of sharing our neighborhoods with them are great.

Every time we lose another bat colony, we become more dependent on chemical pesticides for insect control. Pesticides already seriously threaten our personal and environmental health. Insecticide use in America has increased tenfold since the 1940s, while crop losses to insects have doubled. The number of insects resistant to pesticides doubled in the period from 1970 to 1980, and the trend continues.

Dr. Robert Metcalf, a professor of biology and entomology at the University of Illinois, recently reported that "There are now about 30 species (of insects) that nothing can kill." Dangerously late, we are discovering that we have disrupted some of nature's most important balances and that we are increasingly defenseless in our ongoing battle with crop pests.

Bats are not only a vital part of our Texas environment, they also are among our state's most fascinating and likeable animals, once we get acquainted. We still can take pride in having the world's largest bat colonies and in having more kinds of bats than any other state. Nevertheless, their survival rests in our hands and requires that we act promptly to protect key sites and to educate people everywhere to a greater appreciation of bat values. **

*Dr. Merlin D. Tuttle is founder and science director of Bat Conservation International, Inc.*

by Michael Rapp

# Bat Hotels For Brazos Bend

Glen Mills

"Would you like to build some bat hotels?", asked Dennis Jones, the Brazos Bend State Park naturalist, when I approached him about doing a service project at the park. I was an Eagle Scout candidate in Boy Scout Troop 99 in Houston, trying to fulfill my final requirement, a service project demonstrating leadership qualities I had learned in my years as a Boy Scout.

That was in March 1988. By mid-August, I had planned my project to build 10 of the three-foot by three-foot by 18-inch, solid cedar "hotels" which would be home to hundreds of bats.

It seemed like a good idea after Mr. Jones explained the need for the houses—to protect and encourage development of bat colonies and to teach the public the truth about bats. "We hope that through this project we can dispel some of the falsehoods and mythology about bats," said Jones. I liked this project because it was different, interesting and a challenge. Eagle Scout projects need to be beneficial to the community, as well.

Donald Rapp

*Michael Rapp (in uniform) received assistance from other scouts and some adults. Among them were (left to right) assistant scoutmaster Ralph Cox, David Cox and Joel Bercu*

"Hopefully the hotels will attract bats, which will consume insects in the park," said Joe Cochran, park superintendent. In this part of Texas, you want to do everything possible to help animals (bats) who can eat up to 3,000 mosquitos each per night. "I think it's for a good cause, conserving the bats," said Cochran.

Since bats are sensitive to man-made chemicals such as glues and preservatives, the bat hotels had to be constructed of solid, untreated cedar, which increased the cost to about $80 each. Additional structural support had to be added to withstand the high winds that tropical storms or hurricanes might bring.

The total project was going to cost more than $800, so I decided to approach local companies that had en-

Glen Mills

joyed a profitable year and whose leadership was most likely to aid community and conservation projects. Through personal presentations, over a period of six to eight weeks, I enrolled 11 sponsors, including the Burgess Buchanan family, ENTEX, Gulf Interstate Engineering, Gulf Southwest Bancorp, San Jacinto Savings, Shelton Greer Co., Stalhman Luber Co., Sterling Chemicals, Weekley Homes, and the Kenneth Williams family.

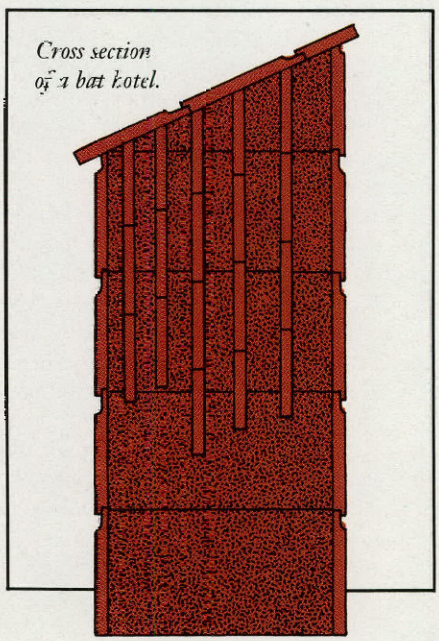
Dennis Jones obtained the construction plan from Bat Conservation International in Austin. "It seemed to be best for the park because hundreds of bats can occupy each house," he said. After building a prototype with my father, I showed my project to Boy Scouts in several troops. Ten other scouts volunteered to help me, and in six weeks we had all 10 hotels built and ready to install. The work included a strengthened supporting structure, a modified roof design and special templates to maintain the crevice spacing to accommodate the sizes of bats usually found in this area. Dr. Paul B. Robertson, associate science director of Bat Conservation International, provided detailed assistance.

One sponsor, Shelton Greer Co., a roofing contractor, let me use its large lift-bed truck to install the bat hotels at the park. With all materials, equipment (including a power generator) and scouts aboard, the truck backed up to the selected tree or pole under Dennis Jones' direction and the entire bed or working platform was elevated to the desired height.

A couple of hotels were stored at the park as spares, along with extra materials for repairs that may become necessary. As the bats move in, additional hotels can be placed in nearby locations.

I not only learned a lot about something new to me, I also was able to help the park and conserve some beneficial creatures. The project helped the public learn about the advantages and good points of bats. **

*One of Michael's 11 sponsors, Shelton Greer Co., lent the scouts a large lift-bed truck to install the bat hotels at Brazos Bend State Park. Park employees directed the placement of the solid cedar structures.*



# San Jacinto Monument Celebrates Golden Anniversary

by J. C. Martin

This year marks the golden anniversary of the San Jacinto Monument, which was constructed to commemorate one of the most decisive victories in history. Along with the San Jacinto Museum of History, the 570-foot monument took three years to complete and was dedicated on April 21, 1939.

A tapering column topped with a star symbolic of the Lone Star State, the monument also is a tribute to significant achievements seldom mentioned. While the monument commemorates the Texas Army's victory that gained independence from Mexico and eventually added a million square miles to the United States, it also represents the determination and hard work of 20th-century Texans who wanted to commemorate the victory with an appropriate tribute.

For many years, various organizations sought to erect a memorial on the battleground. The initiative began in 1856 with the Texas Veterans Association. Near the turn of the century, the Daughters of the Republic of Texas recognized the battleground's historic value and sought funds from the Texas Legislature for acquisition of the site. Their efforts were acknowledged when the legislature authorized the state to purchase the battleground from its private owners. Over the next 40 years, the battleground became a popular regional parkland.

As the 1936 centennial celebration of Texas Independence neared, two organizations, the Daughters and the Sons of the Republic of Texas, led lobbying efforts to gain support for construction of a San Jacinto commemorative. Local business leaders, led by Jesse H. Jones, a prominent Houstonian who later became U. S. Secretary of Commerce, joined their effort, and federal and state funds along with contributions were acquired for the memorial.

Alfred C. Finn, a talented Houston architect known for his art deco designs, was selected to design the monument. Finn commissioned William H. McVey, a Rice Institute instructor, to design and sculpt the friezes surrounding the base. The eight panels depict scenes of the Texas Revolution. The engineering design was by Robert J. Cummins, also of Houston. Cost of construction was $1.5 million.

The monument plans called for an octagonal shaft, faced with Texas Cordova shellstone, to rise above the battleground from a 125,000-square-foot base. Within the base, space was designed for two large entrance foyers and two large galleries. The San Jacinto Museum of History, a nonprofit, private organization, was chartered in 1938 to provide a premier museum of Texas and regional history in the base of the monument.

Approximately 70.7 million tons of Texas Cordova shellstone were needed to complete the structure and the surrounding terrace. This particular shellstone, quarried in Burnet County in Central Texas, is noted for its creamy color and numerous fossils, especially those of the large clam Trigonia. The shellstone is from the Lower Cretaceous period, and is about 100 million years old. Although it was left in its rough-sawn state for the exterior, the stone used for the interior was polished.

Ground was broken on April 21, 1936, on a project so unusual in both design and engineering that it challenged state-of-the-art construction technology and equipment. In charge of construction was W. S. Bellows Construction Company of Dallas and Houston.

The initial challenge was to build a foundation that could support the monument on a bed of red clay. A foundation five feet thick on the perimeter and 15 feet in the center with an integral mass footing was specified. During the base excavation, as soon as the excavating machines reached a grade, a three-inch-thick concrete seal slab was immediately cast to keep the clay moist and serve as a floor for the reinforcing bar.

Reinforcing bars, 100 feet long and two inches square, were spaced 6½ inches on centers both ways. The bars also were welded a the ends and every

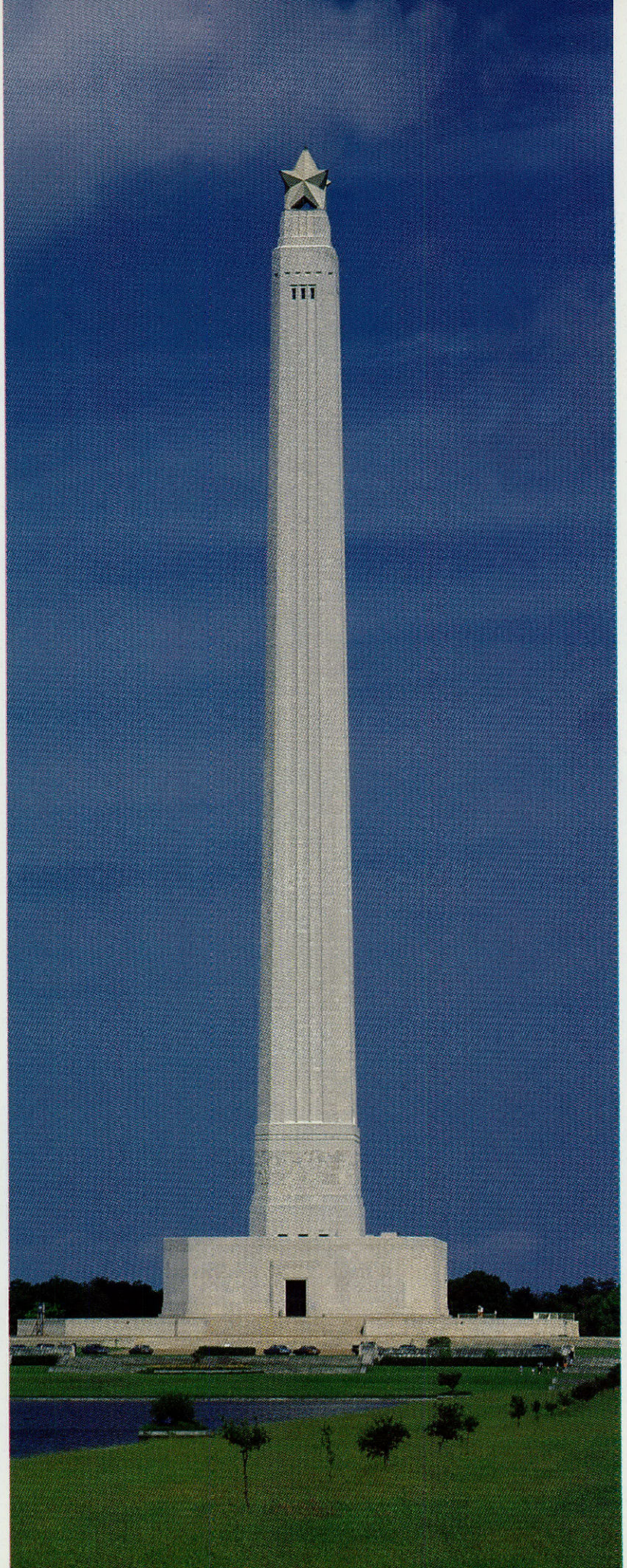
tenth bar was spot welded both ways for ease in spacing.

Rolled in Birmingham, Alabama, the bars were shipped by barge to Houston and unloaded on the Houston Ship Channel, one mile from the site. Because of their length, they were extremely limber and easily bent, which made handling difficult. A structural cradle was made to pick up the bars at two points, 65 feet apart, and they were unloaded from the barge by a derrick boom. The bars were then lashed to an 85-foot pole to prevent bending and hauled to the site by placing wheels under each end of the pole. Bars bent in handling presented a problem until it was discovered they could be straightened by using a truck to pull them through a railroad rail bender.

The real test came with pouring the foundation, which was a continuous pour. If the pour were not continuous, the entire foundation would have to be broken out and the contractor would have to start again. Bellows took every possible precaution. Although two mixers could provide a maximum 100 cubic yards of concrete per hour, two spare machines were on site. Two batching plants were stocked with sand and gravel when one was sufficient. Water was electrically pumped from a lake more than half a mile away. A gasoline road pump was hooked on to the line as a backup. Extra pipe and fittings were available in the event of a break.

A system of floodlights was installed for night work. Carbide lights were on standby. And as a precaution against rain, a large circus tent was set up over the excavation with drainage ditches provided to take away the runoff. Since there was no way to put a center pole in the tent, the ridge was suspended by a high line.

With those contingencies in place, the contractor then had to meet an-



*Half a century after its construction, the San Jacinto Monument still stands as a symbol of one of the most decisive victories in history. Recent repair projects are responsible for the monument's spiffy appearance.*

Gwen Fidler

other challenge. Since this was a Public Works Administration project, all labor came from the relief rolls within a 20-mile radius of the project. Of the men employed, barely one-third had ever worked on a construction job. Several dress rehearsals were held beforehand and to accommodate the men, coffee and sandwiches were available at all times.

The pour was completed in 57 hours, and everything went smoothly. During the nonstop work, the San Jacinto Inn restaurant located nearby supplied the workers with 3,800 meat sandwiches and 5,700 cups of coffee.

The basement walls, first floor slab and museum roof slab were framed and poured by ordinary construction methods. For the shaft, however, all concrete work went against the stone facing, which served as an outside form for the concrete. The working system involved two structural steel towers consisting of four eight-inch H-columns and four six-inch H-columns tied together with horizontal and sway bracing. A guy derrick was used to erect the towers and keep them about 100 feet ahead of the construction. A 50-square-foot structural steel working platform with hatches for two cages was suspended from cables. Using different drums and hand wenches, this platform could be cranked upward a foot in five minutes.

Twenty-five feet below and on the inside of the tower was a working scaffold the size of the inside of the shaft. From here the wall forms were erected and concrete placed. Fifteen feet below was another scaffold for wrecking the forms.

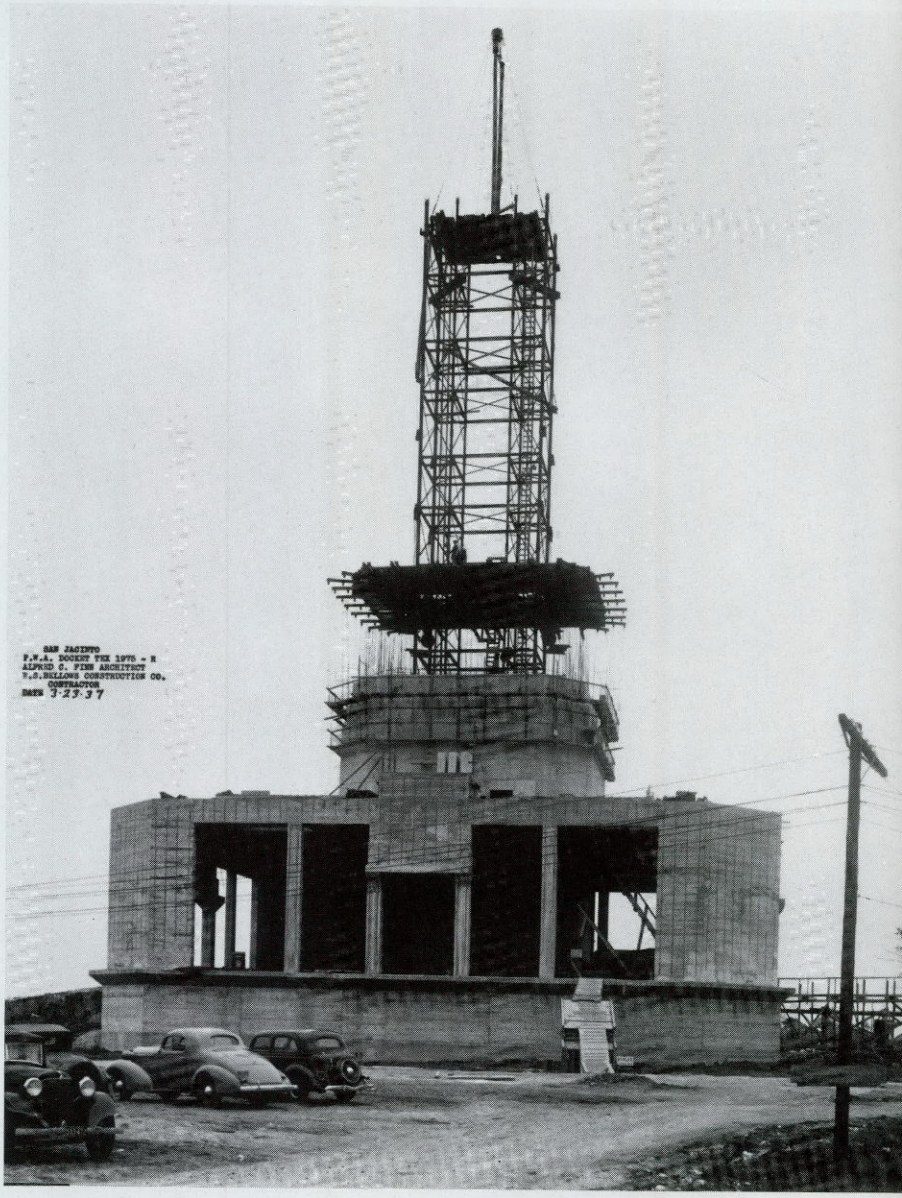
On the outside of the tower was another swinging scaffold—three feet wide—that encircled the tower. From here the masons set all stone. Ten feet below was a similar scaffold—this one only two feet wide—used for cleaning and pointing the stone, or completing all work, as the scaffolding system moved upward.

Seventy-five men made up the scaffold work force. With two courses of stone stocked ahead, the weight of their suspended work area was about 65 tons.

Since the first 60 feet of stone above the museum roof was sculpture stock for the friezes, practically every piece weighed four tons. These large stones were set by using two Chicago booms fastened to diagonal corners of the structural steel tower. These booms, as well as the guy derrick, were operated by electrical hoisting engines set in the basement.

Above the sculpture stock the remaining structure was stone courses two feet high with a maximum weight of 500 pounds each. These were taken on a cage to the top working platform, then lowered through trap doors with mobile hand-operated stone derricks to the wall below, where they were set by the masons.

Because the stone became the outside form for the concrete, high-tension steel was used to make wall-ties that passed through the bed joints. After the concrete was set, the ties were twisted off back into the concrete before the stone was pointed. The

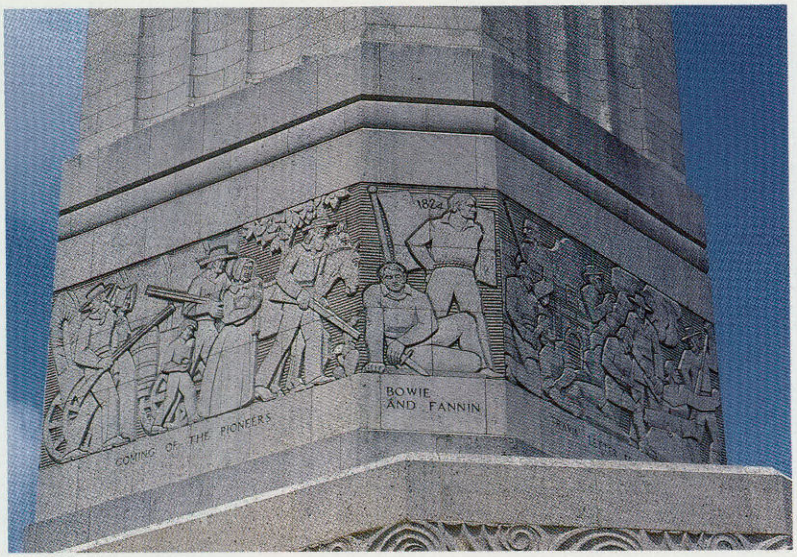



Historical photos courtesy of Houston Metropolitan Research Center, Houston Public Library and San Jacinto Museum of History

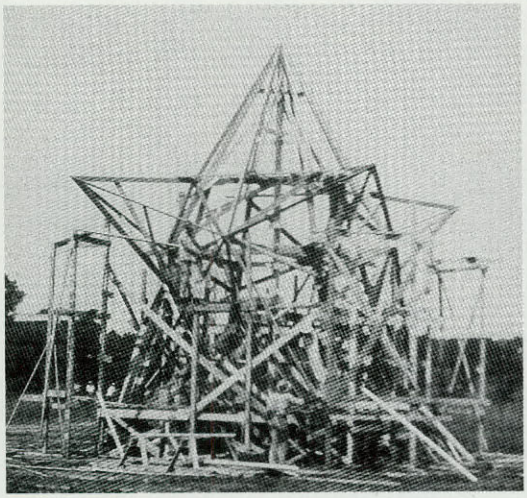
break-off was again used on the inside of the wall and after all ties were broken the forms dropped down and were used again.

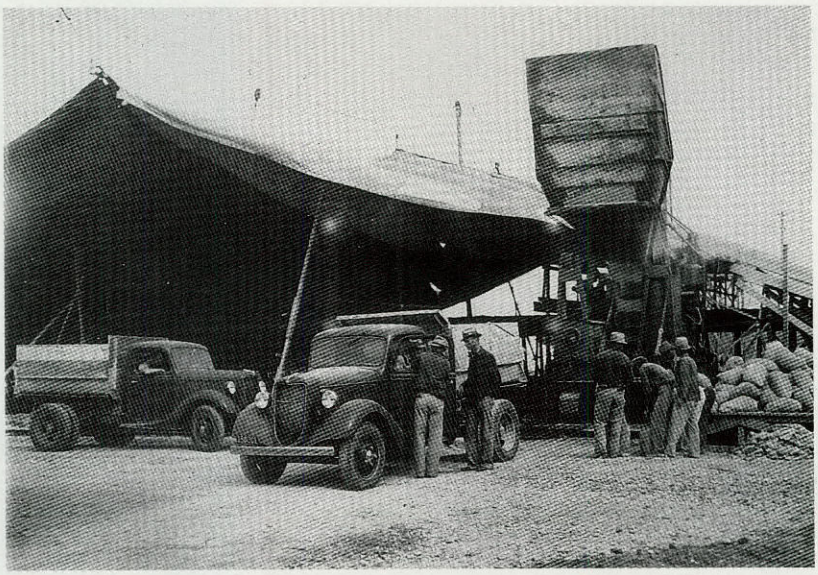
One of the procedures that slowed progress was setting the intersecting concrete tie-beams. These ran the entire height of the tower at 24-foot intervals.

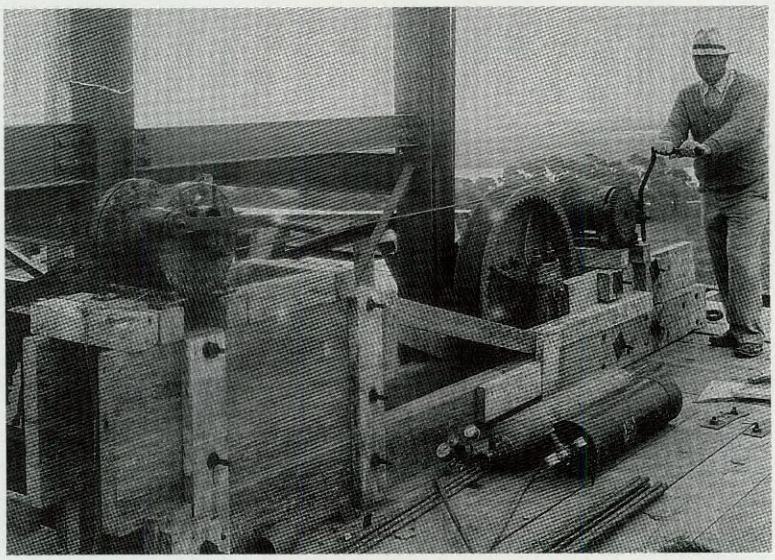
*William McVey, a professor at Rice University, designed the frieze around the base of the shaft.*




Gwen Fidler







*The 1937 photo at left shows the two scaffolding systems used to place the stone facing and the one above for the steel construction and concrete pouring operations. The foundation pour (above right) took 57 hours. The completed foundation was five feet thick on the perimeter and 15 feet in the center. A hoisting system (right) was used for lifting the Texas Cordova shellstone. Each cut piece weighed approximately 500 pounds. Above is the structural skeleton of the star for the top of the monument.*

# SAN JACINTO MONUMENT RESTORATION

by Dale L. Martin

The Parks and Wildlife Department has recently completed a repair project of "monumental" proportions at San Jacinto Monument. The 50-year-old monument, the focal point of San Jacinto Battleground, has up to 2 million visitors every year and houses the invaluable collections and exhibits of the San Jacinto Museum of History.

The Texas Legislature authorized approximately $5.6 million to finance the restoration project, which encompassed three distinct phases of work. Foremost in the minds of those involved were the challenges of keeping the monument open to the public and maintaining security and safety throughout the building.

The first phase included cleaning, waterproofing and repairing the star and restoring and waterproofing the limestone sheathing of the shaft. The electrical system was replaced, and the air-conditioning system was thoroughly overhauled. In the public museum spaces, the walls, ceiling, floors and lighting fixtures were refurbished. Additional fire protection was added to the storage areas, and the security system was modernized. Thanks to excellent coordination among contractors, park staff and museum personnel, the public was minimally inconvenienced.

Phase II began in May 1985, and concentrated on the exterior. The terraces surrounding the monument were replaced and a new drainage system was installed, both vital to the continued long life of the building. Massive new concrete slabs were poured, and the limestone steps and walls were repaired. Electrical service was installed the length of the shaft to air condition the observation deck and elevator equipment. Windows on the observation deck were replaced with safety glass.

By 1986 the monument was ready for the Sesquicentennial Celebration held in the park April 21 and 22, 1986. The monument was the focus of the two-day celebration of the 150th anniversary of Texas independence.

The third and final phase of monument restoration began in 1986. The heating systems, all potable water systems and the storm and septic sewer systems were replaced. Major repairs were made to the roads outside the monument, and a sprinkler system was installed in the lawns.

This project, completed 50 years after the monument's construction, ensures that it will remain a fitting memorial to those Texans who fought and won their independence and secured the fundamental liberties enjoyed in Texas today. **

Each beam had 16 large reinforcing bars running from wall to wall. The guy derrick hoisted them on the outside of the tower and slid them into place end-wise. One day a week the upward progress had to stop to frame the beams, place the steel and pour them. A concrete stairway was framed and poured as the tower went up, and since the stairs carried into the tie-beams, the phase could not lag.

In brief, the operation consisted of placing the steel, setting a stone course, building two feet of forms, cranking up the working platform two feet, then pouring. This operation was repeated three, sometimes four times daily. The result in a week was 24 feet of tower in four days and one day for beam construction.

When the entire height was completed, the scaffold was wrecked and lowered to the ground. It was time to build the star.

To build the star, beams were placed on the top slab and allowed to cantilever out over the walls about six feet. Planks went down on the beams to create a scaffold.

I-beams, to be used to get materials to the star, were extended out windows at the observation floor 500 feet above the ground. Ninety feet of tubular tower then was erected on these cantilever beams up the outside of the shaft. Materials were brought up the shaft 500 feet, then transferred to an outside cage and carried up.

Before the actual star was built, a one-inch scale model was made of plywood, erected in the air and revised several times until Finn was satisfied with the shape. Bellows then built a full size wooden model and drew a set of plans from the model. The model also was used to develop plans for the somewhat complicated structural steel construction.

Steel, concrete and stone went into the star. Given its 35-foot dimensions, the points overhung the 19-foot square base, making construction even more difficult.

Removing the guy derrick after the construction of the structural steel frame was another problem. The derrick needed a straight drop and the monument's exterior tapers. So the mast and boom had to be lowered inside the tower.

The star construction demanded a tremendous amount of cutting and fitting. Indicative of the difficulty of the task was the amount of stone used—only two carloads—and the size of each piece brought to the top, none larger than a square foot. Even so, the star was completed in a mere 20 days.

As impressive as the workmen's accomplishments were in erecting the monument, equally extraordinary was their perfect safety record. No serious injury accident occurred throughout construction.

Today the monument still stands, shining proud against the Texas sky. In celebration of its 50th anniversary, festivities will be held at the battleground. Planning the festivities are the Texas Parks and Wildlife Department, which maintains the monument and the battleground, the Daughters of the Republic of Texas, the Sons of the Republic of Texas and the San Jacinto Museum of History.

The public is invited to the formal rededication of the monument on Friday, April 21. Educational and historical activities on Friday will include Republic-era reenactors and 19th-century "games on the ground." **

*J.C. Martin is director of the San Jacinto Museum of History.*

ercy Williamson

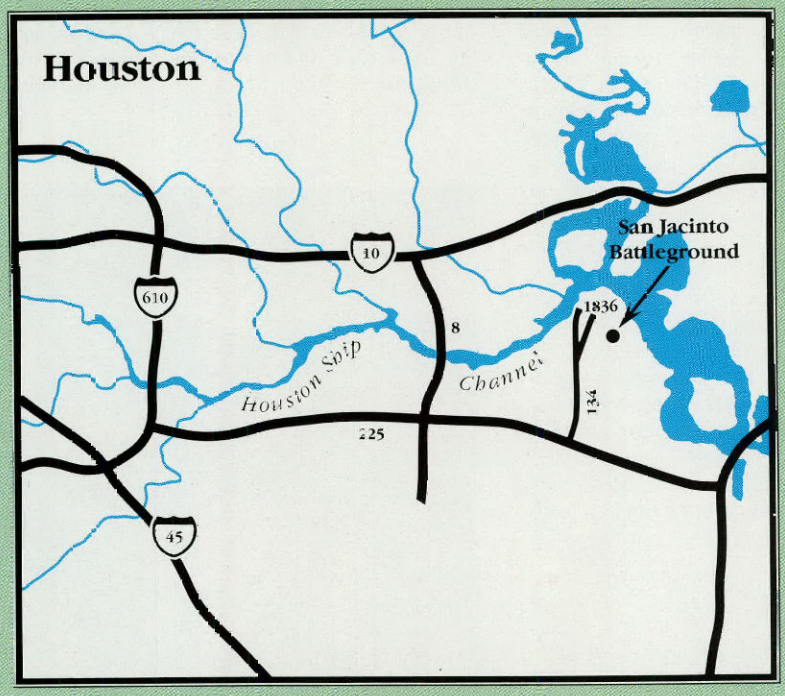
*The San Jacinto Monument was the focus of a 1986 celebration marking 150 years of Texas independence. A rededication of the monument will be held on April 21, 1989.*

## SAN JACINTO BATTLEGROUND
### STATE HISTORIC PARK

The park is located in Harris County, southeast of Houston and adjacent to the Houston Ship Channel. From Houston, take Texas 225 east for 11 miles to Texas 134, then north four miles to Park Road 1836. It is open daily, 8 a.m. to 9 p.m. (8 a.m. to 7 p.m. January through March). For information, call 713-479-2431.

The San Jacinto Museum of History Association operates the museum in the monument. It is open daily except Christmas Day and Christmas Eve, 9 a.m. to 6 p.m. For information, call 713-479-2421.

Admission to the monument and museum is free. Monument elevator charges are $2 for adults and 50 cents for children under 12.



# Outdoor Roundup by Jim Cox

## Six East Texas Areas Stocked with Deer

Crews from the Texas Parks and Wildlife Department's Wildlife Division used drive nets and special net guns to capture wild white-tailed deer in Central and South Texas for stocking in East Texas.

By February 1, about 400 deer had been corraled, loaded into trucks and released at selected Type II wildlife management areas. Officials hoped to release between 800 and 1,000 whitetails in 10 areas during the winter trapping period.

Horace Gore, white-tailed deer program leader, said that while deer populations are excessively high in many parts of East Texas, the Type II lands selected for stocking are good candidate sites for deer releases. "These areas are primarily forest products lands that have been open to hunting for many years, and the deer populations are below capacity because of heavy hunting pressure," said Gore.

Much of East Texas was included in the either-sex system of whitetail bag limits during the 1988–89 season in order to make it easier for hunters to harvest surplus antlerless deer. "There is a wide variation of deer densities in East Texas," Gore noted, "so that's why some regions are overpopulated while others need help."

Gore explained that deer are collected in Central and South Texas because the terrain is more conducive to trapping than it is in East Texas. "We have collected deer mainly from ranches that have surplus deer," Gore said, "but we also have trapped in subdivisions, state parks and industrial parks where deer have become a problem."

The deer translocation program is financed in part by funds raised from the Type II public lands hunting program launched during the past deer season. Purchasers of $35 permits were offered access to some 670,000 acres for hunting and camping.

Type II permits, along with map booklets, will be available from department offices by August 1. Limited use permits, which allow the holder to enter and use Type II areas without hunting, also will be available for $10.

## Dance Celebration Planned at Landmark Inn

A "Heritage Dance Celebration" is set for 1–3 p.m. April 8 at Landmark Inn State Historic Site in Castroville.

Texas Parks and Wildlife Department officials said three groups will perform authentic German, Alsatian and Mexican folk dances, representing the three ethnic groups that settled Castroville.

German dances will be performed by the New Braunfels Germanfold Dancers, Alsatian by the Alsatian Dancers of Texas and Mexican by the Ballet Folklorico de Navarro.

Castroville is 30 minutes west of San Antonio on U.S. Highway 90. For further information call the park at 512-538-2133.

## Big Bass Grows Past State Record Weight

Austin college student Troy Johnson can now claim he owns the biggest largemouth bass ever caught in Texas. But the big fish is not a new state record.

Johnson's fish was caught almost exactly a year ago at Gibbons Creek Reservoir near Bryan. At that time, the 16-pound, two-ounce lunker was the fourth-largest bass ever caught in Texas.

Johnson loaned the big female to the Texas Parks and Wildlife Department's "Operation Share A Lone Star Lunker" program headquartered at the Tyler State Fish Hatchery.

The big fish adapted to aquarium life so well she spawned five times last spring and still had enough vigor to gain more than two pounds during the year.

When hatchery superintendent David Campbell had to do maintenance work on the 3,000-gallon aquarium he took the opportunity to weigh the prize fish. At 18 pounds, 13.28 ounces, the big fish is one pound, 2.5 ounces heavier than the current state record bass caught by Mark Stevenson from Lake Fork in November 1986.

Thus Johnson has bragging rights to the state's biggest bass but no state record since the fish's weight when legally caught is the only valid weight for the record book.

Bill Rutledge, chief of the department's Hatcheries Branch, said Johnson's bass continues to amaze biologists. "This fish is only eight years old, which is still relatively young for a bass," said Rutledge, "so it makes you wonder just how large she can get." Rutledge believes the fish was one of the original group of fingerling Florida-strain bass stocked at Gibbons Creek in 1981.

For comparison, Stevenson's state record bass, which weighed 17 pounds, 10.7 ounces, was nine years old when caught in 1986. Rutledge said bass are known to live longer than 10 years, but determining exact age by counting rings on the fish's scales becomes difficult with the older fish.

The Operation Share A Lone Star Lunker program, now entering its third season, is now open. Anglers catching 13-pound-plus largemouths can allow the department to use them for spawning. Participating anglers receive fiberglass replicas of their fish, and in most cases the fish are returned to their lakes of origin after the spring spawning season. Fishermen catching prospective lunker fish should call the Tyler hatchery at 214-592-7570. The lunker program is supported by four corporate sponsors: Lone Star Brewing Co., Jungle Labs, Inc., Skeeter Boats and Honey Hole Magazine.

*Continued on page 17*

Leroy Williamson

*Troy Johnson's Gibbons Creek monster is still alive and spawning, while its replica adorns a shiny new hatchery facility at San Marcos.*

Leroy Williamson

*Deer populations are booming in much of East Texas, but some Type II hunting lands still can benefit from whitetail stocking programs.*

# A Guide to the State Parks of Texas

CONTENTS

Laurence Parent

*Balmorhea State Recreation Area, site of the world's largest spring-fed swimming pool, is a welcome oasis between El Paso and Big Bend.*

# Welcome to the State Parks of Texas

Thousands of people have discovered that Texas state parks are perfect places for camping trips, Sunday afternoon outings and historical study, but most Texans have seen only a fraction of the more than 100 parks located all across the state.

This special section of *Texas Parks & Wildlife* magazine is designed to acquaint you with the parks and historical areas: where they are, what facilities are available and how to contact them. On page P4, you'll find some of the most frequently asked questions about Texas state parks. There also is a chart that will tell you at a glance about the activities and facilities in each park.

Whether you're looking for a park close to home or across the state, the map in the center of this section will show you where the parks are. Many of the historical day-use parks are close to parks with campgrounds, so keep this in mind when you're planning a trip.

Variety is the key word when talking about Texas state parks. Choices range from the huge Palo Duro Canyon in the Panhandle to the sandy coastal parks. The scenic Hill Country has a number of parks, as does the East Texas Pineywoods. The historical parks and historic sites encompass many periods of the state's past.

Outdoor recreation can be enjoyed year around in Texas, and you can have an economical vacation by taking advantage of the parks and historical areas. State parks are accessible to all Texans, whether you want to stay close to home or travel across the state.

# Questions and Answers about Texas Parks

**When are the parks open?**

Most parks are open every day, all year. Parks with overnight facilities close at 10 p.m. to day-use visitors. Day-use-only parks are open 8 a.m. to 5 p.m. Some historical parks are closed Mondays and Tuesdays. A few parks are closed during the fall public hunts, for Christmas, or for annual maintenance projects. Contact each park or Austin Headquarters for schedules.

**Is there a fee for using the park?**

Most parks require a nominal daily entrance fee. A facility use fee is also charged depending on what facilities are used. Refer to the **Fee Schedules** section and the corresponding charts on the following pages.

No fee will be charged for individuals entering and leaving the park when the purpose of entry is to bring individuals to the park who have paid the per person entry fee.

**Are Annual and Group Permits available?**

Yes. Refer to **Annual Permits** section for details.

**Are Senior Citizen discounts available?**

A **State Parklands Passport** exempts all persons 65 or older and veterans with 60 percent VA disability from paying an entrance fee. Passports are available at most parks and at the Austin Headquarters. Those eligible must apply in person with proper identification and proof of age or disability.

**Is there a parking fee?**

Only if visitors exceed the two-vehicle limit (a combination of motor vehicles and trailers) for **campsites, cabins,** and **shelters.** A $2.00 per day fee is charged for each vehicle over the two-vehicle limit. Boat trailers and small utility trailers do not count. Excess vehicles must be parked in areas designated by the Park Manager.

**Can I make reservations?**

Yes, and reservations are recommended for overnight facilities, group facilities and the State Railroad—especially during the busy summer months. Write or call each park between 8 a.m. and 5 p.m., daily. Refer to **Reservations** section for specific details.

**Can group facilities be reserved?**

Yes. Drawings are held annually on January 11th for groups to reserve buildings during the year from February 1 to January 31. After the drawings, it's first-come, first-served. Refer to **Group Facilities** section for more information.

**What's the check-out time for overnight facilities?**

2 p.m. at most park facilities; 12 noon at Indian Lodge and Landmark Inn.

**Do overnight facilities have capacity limits?**

Campsites and screened shelters are designed to accommodate only one family or party unit of not more than eight persons.

Cabin capacities are posted in each cabin and at park headquarters. Room capacities for Indian Lodge, San Solomon Springs Courts, and Landmark Inn are posted in the rooms and at the registration desk.

**Is firewood available?**

Gathering firewood within the parks is not allowed. However, firewood can be purchased from concessioners at selected parks.

**Are pets allowed in the parks?**

Yes, but they must be confined or on a leash no longer than six feet. Pets are not allowed in public buildings or swimming areas.

**Are parks and facilities handicapped-accessible?**

Yes. Most parks have facilities accessible to the handicapped. Request specific information from Austin Headquarters.

**Do you accept credit cards?**

No.

## ANNUAL PERMITS

A **$25 ANNUAL PARK ENTRANCE PERMIT** is valid at most parks (passenger-carrying buses not eligible).

**$4.00 DUPLICATE ANNUAL ENTRANCE PERMIT for additional vehicles.**

**A $13.00 RESTRICTED ANNUAL PARK ENTRANCE PERMIT** is valid at one (1) park designated at time of purchase (passenger-carrying buses not eligible).

**$1.00 REPLACEMENT FOR ANNUAL, RESTRICTED ANNUAL, OR DUPLICATE.**

These permits may be purchased at any state park where applicable.

A **$25.00 ANNUAL GROUP ENTRANCE PERMIT** is valid for youth groups (18 years of age and under) at all parks where applicable. Each permit is valid for up to 50 persons. Park entry may be by motor vehicle (no limit on number of vehicles), bus, bicycle or on foot. Write to Austin Headquarters for required application form.

Additional facility use fees are still required.

NOTE: TO BE VALID, ENTRANCE PERMITS MUST BE PERMANENTLY ATTACHED IN LOWER LEFT-HAND CORNER OF THE VEHICLE WINDSHIELD, ABOVE OR TO THE RIGHT OF THE VEHICLE INSPECTION STICKER.

Lercy Williamson

*Camping is pleasant almost any time of the year at Davis Mountains State Park. Since the park elevation ranges from 4,900 feet to 5,500 feet, the summers are cool and the winters mild.*

## RESERVATIONS

**How do I make reservations?**

Stop by, write, or call the park headquarters between 8 a.m. and 5 p.m. daily.

**How far in advance may I reserve a facility?**

90 days is the maximum advance reservation permitted for campsites, cabins and screened shelters. Reservations for Indian Lodge, San Solomon Springs Courts and Landmark Inn are made in the same manner prescribed for cabins, but for as much as 12 months in advance. Designated group facilities may be reserved up to 12 months in advance. Refer to **Group Facilities** section for details.

**Is a reservation fee required?**

Yes, if reservations are made more than 10 days in advance. The reservation fee is equal to one day's fee for each facility reserved and will be applied to the total fee due upon registration. Telephone reservations will be held only five days to allow receipt of the reservation fee.

**What about cancellations and refunds?**

If a reservation or any part of a reservation is cancelled at least 72 hours before the arrival date, the reservation fee will be refunded; otherwise, the fee will be forfeited.

Reservations made 10 days or less in advance will be cancelled at 6 p.m. on arrival date unless late arrival privileges have been arranged with the park.

**Can I guarantee my reservation for late arrival?**

Yes, but you must call the park headquarters between 8 a.m. and 5 p.m. either on the day of arrival or the day before to arrange late arrival privileges. (This is required only for reservations with no fee.)

**Can I reserve a specific site?**

**For campsites and shelters:**

No. However, your request may be considered if, on arrival, (1) the site will accommodate your equipment, and (2) no user fee has been paid for it. Reservations for adjoining or adjacent facilities will be honored subject to availability.

**For cabins:**

Preferences will be honored if available; confirmations will be made by facility number. The department reserves the right to change assignments if confirmed cabin is out of service upon arrival.

**How long may I stay at a facility?**

14 days, continuously.

## GROUP FACILITIES

Drawings are held annually on January 11th to reserve designated group facilities for the year beginning February 1st–January 31st. After the drawings, it's first-come, first-served. Then, reservations may be made as explained in **Reservations.**

The drawings are held at the respective park headquarters at 10 a.m.

Each group may submit only one entry but may list four dates in order of preference as alternatives, should the dates of their first choice be unavailable.

Groups should obtain an entry blank from a park with group facilities and leave the completed form at the park headquarters beginning December 1st.

Participants will be notified as soon as possible if the reservation is confirmed. A reservation fee in the amount of one day's user fee must be received by the park by 5 p.m. January 31st. Otherwise, the reservation will be cancelled.

The reservation fee is applied to the total fee which is due upon arrival.

If the group facility reservation is cancelled at least 72 hours before the arrival date, the reservation fee will be refunded, otherwise, the fee will be forfeited.

# Facilities and Activities

| | Acreage | Daily Entrance/Use Fee (See P12) | Annual, Restricted, Group Permits Valid | State Parklands Passport Valid | Day Use Only | Historic Structure | Museum and/or Exhibit | Restrooms | Showers | Trailer Dump Station | Camping: Primitive | Camping: With water | Camping: With water & elec. | Camping: With water, elec., sewage | Screened Shelter | Cabins | Overnight Group Facility | Day Use Group Facility | Nature/Hiking Trails | Equestrian Area | Playground | Picnicking | Swimming Pool | Boat Ramp | Fishing | Swimming | Water Skiing | Groceries (seasonal) | Miscellaneous |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Abilene** | 621.4 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | ■ | | ■ | ■ | ■ | | | ■ | ■ | | | | | | L |
| **Acton** *(Burial Site of Davy Crockett's Wife)* | .006 | | | | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | | |
| **Admiral Nimitz** *(Japanese Garden of Peace; History Walk of the Pacific War)* | 9.1 | B | | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | A |
| **Atlanta** | 1,475.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | | | | ■ | ■ | | | ■ | | ■ | □ | □ | □ | | |
| **Balmorhea** *(San Solomon Springs Courts)* | 45.9 | A, K | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | | | | | ■ | ■ | | | | | | I |
| **Bastrop** | 3,503.7 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | □ | | | ■ | G, D |
| **Battleship Texas** | | B* | | | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | |
| **Bentsen-Rio Grande** | 587.7 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | | ■ | | | | ■ | ■ | | ■ | ■ | | ■ | □ | | | | |
| **Big Spring** | 370.2 | A | ■ | ■ | ■ | | ■ | ■ | | | | | | | | | | ■ | | | ■ | | | | | | | | D |
| **Blanco** | 104.6 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | | ■ | ■ | | ■ | | | | □ | □ | | | B |
| **Bonham** | 261.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | ■ | ■ | | | ■ | | | ■ | ■ | □ | | | B |
| **Brazoria County** | 501.6 | | | | | | | | | | ◪ | | | | | | | | | | □ | | | | □ | □ | | | |
| **Brazos Bend** | 4,897.0 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | | ■ | ■ | | ■ | ■ | | | ■ | | | | |
| **Bryan Beach** *(undeveloped Gulf Beach)* | 8.78 | | | | | | | | | | ◪ | | | | | | | | | | □ | | | | □ | □ | | | |
| **Buescher** | 1,017.3 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | ■ | | ■ | ■ | ■ | | ■ | ■ | | | □ | □ | | | |
| **Caddo Lake** | 480.2 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | ■ | | ■ | ■ | □ | □ | | B |
| **Caddoan Mounds** | 93.5 | C | | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| **Caprock Canyons** | 13,960 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | ■ | ■ | ■ | | ■ | | ■ | ■ | □ | | | |
| **Cassells Boykin** | 265.0 | H | | | | | | ■ | | ■ | | ■ | | | | | | | | | | ■ | | ■ | □ | □ | □ | | |
| **Choke Canyon** *(Callihan Unit)* | 1,100 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | ■ | | | ■ | ■ | | ■ | ■ | ■ | ■ | □ | □ | □ | ■ | A, B |
| **Choke Canyon** *(South Shore Unit)* | 385 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | | ■ | ■ | | ■ | □ | □ | □ | | |
| **Cleburne** | 528.8 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | | ■ | | ■ | □ | □ | | ■ | B |
| **Colorado Bend** *(only 300 vehicles allowed)* | 5,328.3 | A, G | ■ | ■ | | | | ■ | | | ■ | | | | | | | | ■ | | | | | | ■ | □ | | | |
| **Confederate Reunion Grounds** | 74.1 | | | | ■ | | | ■ | | | | | | | | | | ■ | ■ | | ■ | | | | □ | □ | | | |
| **Copano Bay**+ | 5.9 | D | | | | | | ■ | | | | | | | | | | | | | | | | ■ | ■ | | | | |
| **Copper Breaks** | 1,888.7 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | ■ | ■ | | ■ | | ■ | ■ | □ | | | L |
| **Daingerfield** | 550.9 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | | ■ | | ■ | ■ | | | ■ | | ■ | ■ | □ | | ■ | B |
| **Davis Mountains** *(Indian Lodge)* | 1,869.4 | A, J | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | | | ■ | ■ | | | ■ | | | | | | | D, I |
| **Dinosaur Valley** *(Dinosaur Footprints)* | 1,272.2 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | ■ | ■ | | ■ | | | □ | □ | | | L |
| **Eisenhower** *(Marina)* | 457.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | | ■ | | ■ | ■ | □ | □ | | |
| **Eisenhower Birthplace** | 2.8 | C* | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| **Enchanted Rock** *(only walk-in tent campsites available; no vehicles permitted in camping area)* | 1,643.5 | A | ■ | ■ | | | | ■ | ■ | | ■ | ■ | | | | | | ■ | ■ | | ■ | ■ | | | | | | | |
| **Fairfield Lake** | 1,460.0 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | ■ | ■ | | | ■ | | ■ | ■ | □ | □ | | |
| **Falcon** | 572.6 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | | ■ | | | ■ | ■ | | ■ | □ | □ | □ | | |
| **Fannin Battleground** | 13.6 | | | | ■ | | ■ | ■ | | | | | | | | | | ■ | | | ■ | ■ | | | | | | | |
| **Fanthorp Inn** | 1.4 | C | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| **Fort Griffin** | 506.2 | A | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | | | ■ | | | □ | | | | L |
| **Fort Lancaster** | 81.6 | | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| **Fort Leaton** | 16.5 | C* | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | ■ | | | | | | | | |
| **Fort McKavett** | 81.2 | | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | ■ | | | | | | | | |
| **Fort Parker** | 1,485.2 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | ■ | | | ■ | | | ■ | | | | | | | | |
| **Fort Richardson** | 396.1 | A | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | ■ | | ■ | ■ | | ■ | | | ■ | ■ | □ | □ | | B |
| **Franklin Mountains** *(pedestrian access only)* | 16,108 | | | | ■ | | | | | | | | | | | | | | | | | | | | □ | | | | |
| **Fulton Mansion** | 2.3 | B* | | | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | |
| **Galveston Island** *(Summer Dramas "The Lone Star" and "Oklahoma")* | 1,944.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | | ■ | | ■ | | ■ | | ■ | | | ■ | | | □ | □ | | | |
| **Garner** | 1,419.8 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | | | □ | □ | | ■ | B, M |
| **Goliad** *(General Ignacio Zaragoza)* | 185.7 | A | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | ■ | ■ | ■ | | ■ | ■ | ■ | | □ | | | | |
| **Goose Island** | 314.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | ■ | | ■ | ■ | | ■ | ■ | □ | □ | | |
| **Governor Hogg Shrine** *(Honeymoon Cottage & Stinson Home)* | 26.7 | C* | | | ■ | ■ | ■ | ■ | | | | | | | | | | ■ | | | ■ | | | | | | | | |
| **Guadalupe River** | 1,938.1 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | ■ | ■ | | | | □ | □ | | | |
| **Hill Country** | 5,369.8 | | | | | | | | | | ◪ | | | | | | | ■ | ■ | | | | | | | | | | |
| **Hueco Tanks** *(Indian Pictographs)* | 860.3 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | | ■ | | | | | | | | |
| **Huntsville** | 2,083.2 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | | ■ | | | ■ | ■ | | ■ | | | ■ | ■ | □ | | ■ | B, M |
| **Inks Lake** | 1,201.0 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | | ■ | ■ | | ■ | ■ | | ■ | ■ | □ | □ | ■ | B, G |
| **Jim Hogg** | 177.4 | | | | ■ | ■ | ■ | ■ | | | | | | | | | | | ■ | | ■ | | | | | | | | |

## MISCELLANEOUS

* Charge is only for conducted tours
\+ Facilities not operated by Parks & Wildlife
□ Permitted but facilities not provided
■ Facilities/services provided
◩ Primitive camping–no charge
B Boats for rent (seasonal)
H Horses for rent (seasonal)
D Scenic Drive
L Texas Longhorn Herd
A Auditorium
G Golf
M Miniature Golf (seasonal)
I Hotel Type Accommodations

| | Acreage | Daily Entrance/Use Fee (See P12) | Annual, Restricted, Group Permits Valid | State Parklands Passport Valid | Day Use Only | Historic Structure | Museum and/or Exhibit | Restrooms | Showers | Trailer Dump Station | Camping: Primitive | Camping: With water | Camping: With water & elec. | Camping: With water, elec., sewage | Camping: Screened Shelter | Camping: Cabins | Overnight Group Facility | Day Use Group Facility | Nature/Hiking Trails | Equestrian Area | Playground | Picnicking | Swimming Pool | Boat Ramp | Fishing | Swimming | Water Skiing | Groceries (seasonal) | Miscellaneous |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jose Antonio Navarro | .6 | C | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| Kerrville | 517.2 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | ■ | ■ | | ■ | ■ | □ | | | |
| Lake Arrowhead | 524.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | ■ | | ■ | | ■ | ■ | □ | □ | ■ | |
| Lake Bob Sandlin | 641.0 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | | ■ | ■ | | | ■ | | ■ | ■ | □ | □ | | |
| Lake Brownwood | 537.5 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | | | ■ | | ■ | ■ | □ | □ | ■ | |
| Lake Colorado City | 500.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | | | ■ | | ■ | ■ | □ | □ | | |
| Lake Corpus Christi | 365.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | | ■ | | | ■ | ■ | | ■ | ■ | □ | □ | ■ | B |
| Lake Lewisville | 721.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | ■ | | ■ | ■ | | | | ■ | | ■ | □ | □ | □ | | |
| Lake Livingston | 635.5 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | ■ | | ■ | | ■ | | | ■ | ■ | ■ | ■ | | □ | ■ | |
| Lake Mineral Wells | 2,905.0 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | □ | | ■ | B |
| Lake Somerville | 5,200.0 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | □ | □ | | |
| Lake Texana | 575.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | ■ | ■ | | ■ | ■ | ■ | | ■ | ■ | □ | □ | | |
| Lake Whitney *(Airstrip)* | 955.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | ■ | | ■ | | ■ | ■ | | ■ | □ | □ | □ | | |
| Landmark Inn | 4.7 | L | | | | ■ | ■ | ■ | | | | | | | | | ■ | ■ | | | ■ | | | | | | | | I |
| Lipantitlan | 5.0 | | | | | | | | | | ◩ | | | | | | | | | | ■ | | | | | | | | |
| Lockhart | 263.7 | A | ■ | ■ | | | | ■ | ■ | | | ■ | ■ | ■ | | | ■ | ■ | | | ■ | ■ | | | | | | | G |
| Longhorn Cavern+ *(Daily Cavern Tours)* | 639.0 | F | | | ■ | | ■ | ■ | | | | | | | | | | | | | ■ | | | | | | | | |
| Lost Maples | 2,174.2 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | ■ | | | ■ | | | □ | □ | | | | |
| Lyndon B. Johnson | 732.8 | | | | ■ | ■ | ■ | ■ | | | | | | | | | ■ | ■ | | ■ | ■ | ■ | | □ | | | | | A L |
| Mackenzie+ | 542.2 | | | | | | | ■ | | | | ■ | | | | | | | | | ■ | ■ | | ■ | | | | | G |
| Magoffin Home | 1.5 | C | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| Martin Creek Lake | 286.2 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | ■ | ■ | | ■ | | | ■ | ■ | | ■ | | ■ | □ | □ | □ | | | |
| Martin Dies, Jr. | 705.0 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | | ■ | ■ | | ■ | | ■ | ■ | □ | □ | | | |
| Matagorda Island | 7,325.0 | | | | | ■ | | ■ | | | ◩ | | | | | | | | | | □ | | | □ | □ | □ | | | |
| McKinney Falls | 640.6 | A | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | | ■ | ■ | | ■ | | ■ | ■ | ■ | | ■ | | | □ | | | | | |
| Meridian | 502.4 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | ■ | | | | ■ | | ■ | □ | □ | | | | |
| Mission Tejas | 118.0 | A | ■ | ■ | | ■ | | ■ | ■ | | | ■ | ■ | ■ | | | | ■ | ■ | | ■ | | | □ | □ | | | | |
| Monhans Sandhills | 3,840.0 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | | ■ | | | | | | | | |
| Monument Hill/Kreische Brewery | 40.3 | A | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | ■ | | ■ | ■ | | | | | | | | |
| Mother Neff | 259.0 | | | | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | ■ | | ■ | | | □ | | | | | |
| Mustang Island | 3,790.2 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | | ■ | | | | | | | | ■ | | | □ | □ | | | | |
| Old Fort Parker | 11.1 | C | | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| Palmetto | 263.6 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | ■ | | ■ | ■ | | ■ | □ | | | | |
| Palo Duro Canyon *(Summer Drama "Texas")* | 16,402 | A | ■ | ■ | | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | | | | ■ | ■ | | ■ | | | | | | ■ | L D H |
| Pedernales Falls | 4,860.0 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | | ■ | | | | | ■ | | | | ■ | | □ | □ | | | | |
| Port Isabel Lighthouse | .6 | C | | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | | |
| Port Lavaca+ | 1.8 | D | | | | | | ■ | | | | | | | | | | | | | | | | ■ | ■ | | | | |
| Possum Kingdom | 1,528.7 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | ■ | | | | | ■ | | | ■ | ■ | □ | □ | ■ | B L |
| Purtis Creek | 1,533.0 | A E | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | ■ | | | ■ | | | ■ | ■ | | | | |
| Queen Isabella+ *(County boat ramp adjacent)* | 7.0 | D | | | | | | ■ | | | | | | | | | | | | | | | | | ■ | | | | |
| Rusk/Palestine | 136.0 | | | | | | | ■ | ■ | ■ | | ■ | ■ | ■ | | | | ■ | | | ■ | | | | □ | | | | B |
| Sabine Pass Battleground | 56.3 | | | | ■ | | | ■ | | | | | | | | | | | | | ■ | | | ■ | □ | | | | |
| Sam Bell Maxey House | .4 | C | | | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | |
| San Jacinto Battleground & Monument | 974.4 | | | | ■ | ■ | ■ | ■ | | | | | | | | | | ■ | | | ■ | | | | □ | | | | |
| San Jose Mission+ | 22.6 | | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| Sea Rim | 15,099.1 | A | ■ | ■ | | | | ■ | ■ | ■ | ■ | | ■ | | | | | | ■ | | ■ | | | ■ | □ | □ | | | |
| Seminole Canyon *(Indian Pictographs)* | 2,172.5 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | | | | | | ■ | | ■ | | | | | | | | |
| Sheldon | 2,503.0 | | | | ■ | | | | | | | | | | | | | | ■ | | □ | | | ■ | ■ | | | | |
| Starr Mansion | 3.1 | C | | | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | |
| Stephen F. Austin | 667.4 | A | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | | ■ | | ■ | ■ | | | ■ | ■ | | ■ | ■ | ■ | | □ | | | | G |
| Texas State Railroad *(Contact Park for schedule of runs)* | 488.7 | I | | | ■ | | ■ | ■ | | | | | | | | | | | | | | | | | | | | | |
| Tips+ | 31.3 | | | | | | | ■ | ■ | | | ■ | ■ | | | | | ■ | | | ■ | | | | □ | | | | |
| Tyler | 985.5 | A | ■ | ■ | | | | ■ | ■ | ■ | | ■ | ■ | ■ | ■ | | ■ | ■ | ■ | | ■ | | | ■ | ■ | □ | | ■ | B |
| Varner-Hogg Plantation *(Plantation House Museum)* | 65.7 | B* | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | ■ | | | | | | | | |
| Washington-on-the-Brazos *(Anson Jones Home)* | 154.3 | C* | | | ■ | ■ | ■ | ■ | | | | | | | | | | ■ | ■ | | ■ | ■ | | | | | | | A |

# The State Parks of Texas

## State Parks

1. Bastrop
2. Bentsen-Rio Grande
3. Buescher
4. Caddo Lake
5. Caprock Canyons
6. Copper Breaks
7. Daingerfield
8. Davis Mountains
9. Dinosaur Valley
10. Galveston Island
11. Garner
12. Guadalupe River
13. Brazos Bend
14. Huntsville
15. Inks Lake
16. Lake Mineral Wells
17. Longhorn Cavern
18. Martin Dies, Jr.
19. McKinney Falls
20. Monahans Sandhills
21. Mother Neff
22. Mustang Island
23. Palmetto
24. Palo Duro Canyon
25. Pedernales Falls
26. Sea Rim
27. Tyler

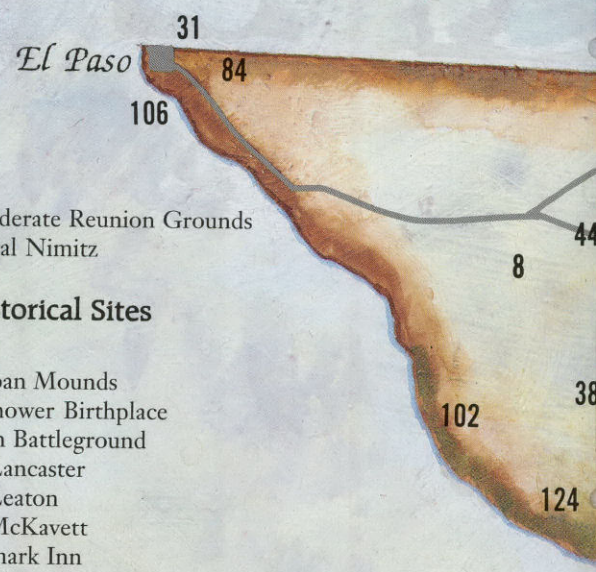
*28. South Llano River Site
*29. Resaca de la Palma Site
*30. Village Creek Park Site
31. Franklin Mountains
32. Choke Canyon
*33. Lake Houston
34. Rusk/Palestine
35. Matagorda Island
36. Colorado Bend
*37. Davis Hill Site
*38. Elephant Mountain
*39. Fort Boggy
*40. Kickapoo Cavern
*41. Matagorda Peninsula

## State Recreation Areas

42. Abilene
43. Atlanta
44. Balmorhea
45. Big Spring
46. Blanco
47. Bonham
48. Brazoria County
49. Bryan Beach
50. Cleburne
51. Eisenhower
52. Fairfield Lake
53. Falcon
54. Fort Parker
55. Goose Island
56. Sheldon
57. Kerrville
58. Lake Arrowhead
59. Lake Brownwood
60. Lake Colorado City
61. Lake Corpus Christi
62. Lake Livingston
63. Lake Somerville
64. Lake Whitney
65. Lockhart
66. Mackenzie
67. Martin Creek
68. Meridian
69. Possum Kingdom
70. Purtis Creek
71. Tips
72. Lake Texana
*73. Arroyo Colorado Site
74. Lake Bob Sandlin
75. Lake Lewisville
*76. Eagle Mountain Lake
*77. Cedar Hill
78. Cassells Boykin
*79. Lake Tawakoni

## State Historical Parks

80. Fort Griffin
81. Fort Richardson
82. Goliad/General Ignacio Zaragoza
83. Governor Hogg Shrine
84. Hueco Tanks
85. Jim Hogg
86. Lyndon B. Johnson
87. Mission Tejas
88. Sabine Pass Battleground
89. San Jacinto Battleground/ Battleship Texas
90. Seminole Canyon
91. Stephen F. Austin
92. Texas State Railroad
93. Varner-Hogg Plantation
94. Washington-on-the-Brazos




95. Confederate Reunion Grounds
96. Admiral Nimitz

## State Historical Sites

97. Acton
98. Caddoan Mounds
99. Eisenhower Birthplace
100. Fannin Battleground
101. Fort Lancaster
102. Fort Leaton
103. Fort McKavett
104. Landmark Inn
105. Lipantitlan
106. Magoffin Home
107. Monument Hill/Kreische Brewery
108. Jose Antonio Navarro
109. Old Fort Parker
*110. Rancho de las Cabras Site
111. San Jose Mission
112. Fanthorp Inn
113. Starr Mansion
*114. Lubbock Lake Landmark

## State Historic Structures

115. Fulton Mansion
116. Port Isabel Lighthouse
117. Sam Bell Maxey House
*118. Sebastopol House

*Park Not Open To Public


**State Natural Areas**

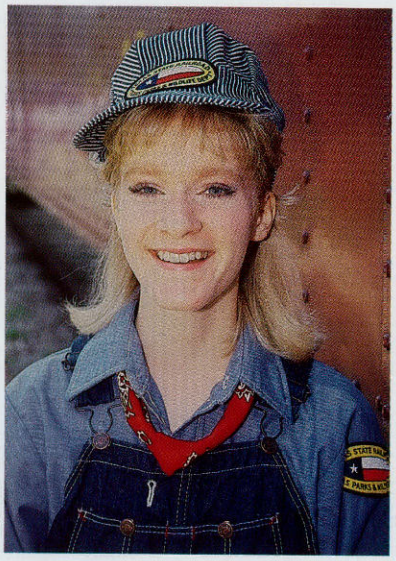
119. Lost Maples
120. Enchanted Rock
121. Hill Country
*122. Honey Creek
*123. Devils Sinkhole
*124. Big Bend Ranch
*125. Devil's River

**State Fishing Piers**

126. Copano Bay
127. Port Lavaca
128. Queen Isabella

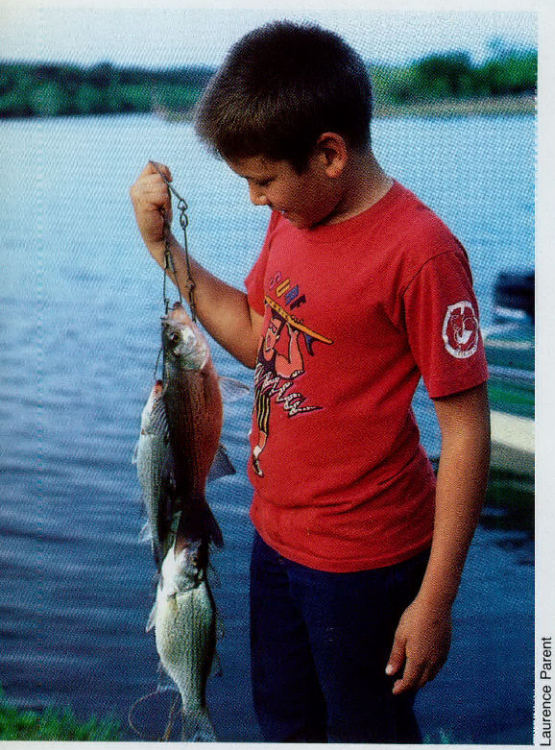
Coordinated by
B. Paez, Zane Morgan
and Barry Hutcheson

# Directory of State Parks



Leroy Williamson

*A smile is part of the uniform and welcome to those who ride the State Railroad between the Pineywoods towns of Rusk and Palestine.*



Laurence Parent

*Scuba and snorkeling opportunities are rare in West Texas. The San Solomon springs at Balmorhea State Park, right, attract divers from El Paso to Midland. Inks Lake State Park, above, is a pretty spot to fish for white bass when the fish make their spring run up the Colorado River close to Burnet and Marble Falls.*

| | |
|---|---|
| 1-800-792-1112 | TEXAS PARKS AND WILDLIFE DEPARTMENT |
| 512 389-4890 | Austin Headquarters |
| | 4200 Smith School Road, Austin 78744 |
| 915 572-3204 | ABILENE Route 1, Tuscola 79562 |
| 512 997-4379 | ADMIRAL NIMITZ P.O. Box 777, Fredericksburg 78624 |
| 214 796-6476 | ATLANTA Route 1, Box 116, Atlanta 75551 |
| 915 375-2370 | BALMORHEA Box 15, Toyahvale 79786 |
| 512 321-2101 | BASTROP Box 518, Bastrop 78602 |
| 713 479-2411 | BATTLESHIP TEXAS 3527 Battleground Road, La Porte 77571 |
| 512 585-1107 | BENTSEN-RIO GRANDE VALLEY P.O. Box 988, Mission 78572 |
| 915 263-4931 | BIG SPRING Box 1064, Big Spring 79720 |
| 512 833-4333 | BLANCO Box 493, Blanco 78606 |
| 214 583-5022 | BONHAM Route 1, Box 337, Bonham 75418 |
| 713 471-3200 | BRAZORIA COUNTY c/o TPWD, 105 San Jacinto Street, La Porte 77571 |
| 409 553-3243 | BRAZOS BEND 21901 FM 762, Needville 77461 |
| 409 737-1222 | BRYAN BEACH c/o Galveston Island State Park, Route 1, Box 156A, Galveston 77551 |
| 512 237-2241 | BUESCHER P.O. Box 75, Smithville 78957 |
| 214 679-3351 | CADDO LAKE Route 2, Box 15, Karnack 75661 |
| 409 858-3218 | CADDOAN MOUNDS Route 2, Box 85C, Alto 75925 |
| 806 455-1492 | CAPROCK CANYONS P.O. Box 204, Quitaque 79255 |
| | CASSELLS BOYKIN c/o Martin Dies, Jr. State Park, Route 4, Box 274, Jasper 75951 |
| 512 786-3868 | CHOKE CANYON (Calliham) Box 2, Calliham 78007 |
| 512 786-3538 | CHOKE CANYON (South Shore) Box 1548, Three Rivers 78071 |
| 817 645-4215 | CLEBURNE Route 2, Box 90, Cleburne 76031 |
| 817 562-5751 | CONFEDERATE REUNION GROUNDS c/o Fort Parker, Route 3, Box 95, Mexia 76667 |
| 915 628-3240 | COLORADO BEND Box 118, Bend 76824 |
| 512 729-8633 | COPANO BAY Concessioner, P.O. Box 39, Fulton 78358 |
| 817 839-4331 | COPPER BREAKS Route 2, Box 480, Quanah 79252 |
| 214 645-2921 | DAINGERFIELD Route 1, Box 286-B, Daingerfield 75638 |
| 915 426-3337 | DAVIS MOUNTAINS Box 786, Fort Davis 79734 |
| 817 897-4588 | DINOSAUR VALLEY Box 396, Glen Rose 76043 |
| 214 465-1956 | EISENHOWER Route 2, Box 50K, Denison 75020 |
| 214 465-8908 | EISENHOWER BIRTHPLACE 208 East Day, Denison 75020 |
| 915 247-3903 | ENCHANTED ROCK Route 4, Box 170, Fredericksburg 78624 |
| 214 389-4514 | FAIRFIELD LAKE Route 2, Box 912, Fairfield 75840 |
| 512 848-5327 | FALCON P.O. Box 2, Falcon Heights 78545 |
| 512 645-2020 | FANNIN BATTLEGROUND Fannin 77960 |
| 409 873-2633 | FANTHORP INN P.O. Box 296, Anderson 77830 |
| 915 762-3592 | FORT GRIFFIN Route 1, Albany 76430 |
| 915 836-4391 | FORT LANCASTER P.O. Box 306, Sheffield 79781 |
| 915 229-3613 | FORT LEATON P.O. Box 1220, Presidio 79845 |
| 915 396-2358 | FORT MCKAVETT P.O. Box 867, Fort McKavett 76841 |
| 817 562-5751 | FORT PARKER Route 3, Box 95, Mexia 76667 |
| 817 567-3506 | FORT RICHARDSON P.O. Box 4, Jacksboro 76056 |

Laurence Parent

Laurence Parent

Leroy Williamson

*The Fulton Mansion near Rockport, upper, has been restored and redecorated to the 19th Century splendor when the mansion was the busy social center of the Texas coast. Dwarf palmettos growing in peat bogs create a lush, junglelike setting at Palmetto State Park near Gonzalez, above.*

| | |
|---|---|
| 512 729-0386 | FULTON MANSION P.O. Box 1859, Fulton 78358 |
| 409 737-1222 | GALVESTON ISLAND Route 1, Box 156A, Galveston 77554 |
| 512 232-6132 | GARNER Concan 78838 |
| 512 645-3405 | GOLIAD (General Zaragoza) P.O. Box 727, Goliad 77963 |
| 512 729-2858 | GOOSE ISLAND Star Route 1, Box 105, Rockport 78382 |
| 214 763-2701 | GOVERNOR HOGG SHRINE Route 3, Park Road 45, Quitman 75783 |
| 512 438-2656 | GUADALUPE RIVER HC 54, Box 2087, Bulverde 78163 |
| 512 796-4413 | HILL COUNTRY Route 1, Box 601, Bandera 78003 |
| 915 857-1135 | HUECO TANKS Rural Route 3, Box 1, El Paso 79935 |
| 409 295-5644 | HUNTSVILLE P.O. Box 508, Huntsville 77340 |
| 915 426-3254 | INDIAN LODGE Davis Mountains State Park, Box 786, Fort Davis 79734 |
| 512 793-2223 | INKS LAKE Route 2, Box 31, Burnet 78611 |
| 214 683-4850 | JIM HOGG Route 5, Box 80, Rusk 75785 |
| 512 226-4801 | JOSE ANTONIO NAVARRO 228 S. Laredo, San Antonio 78207 |
| 512 257-5392 | KERRVILLE 2385 Bandera Highway, Kerrville 78028 |
| 817 528-2211 | LAKE ARROWHEAD Route 2, Box 260, Wichita Falls 76301 |
| 214 572-5531 | LAKE BOB SANDLIN Route 5, Box 224, Pittsburg 75686 |
| 915 784-5223 | LAKE BROWNWOOD Route 5, Box 160, Brownwood 76801 |
| 915 728-3931 | LAKE COLORADO CITY Route 2, Box 232, Colorado City 79512 |
| 512 547-2635 | LAKE CORPUS CHRISTI Box 1167, Mathis 78368 |
| 214 292-1442 | LAKE LEWISVILLE Route 2, Box 353H, Frisco 75034 |
| 409 365-2201 | LAKE LIVINGSTON Route 9, Box 1300, Livingston 77351 |
| 817 328-1171 | LAKE MINERAL WELLS Route 4, Box 39C, Mineral Wells 76067 |
| 409 535-7763 | LAKE SOMERVILLE (Birch Creek) Route 1, Box 499, Somerville 77879 |
| 409 289-2392 | LAKE SOMERVILLE (Nails Creek) Route 1, Box 61C, Ledbetter 78946 |
| 512 782-5718 | LAKE TEXANA P.O. Box 760, Edna 77957 |
| 817 694-3793 | LAKE WHITNEY Box 1175, Whitney 76692 |
| 512 538-2133 | LANDMARK INN P.O. Box 577, Castroville 78009 |
| 512 398-3479 | LOCKHART Route 3, Box 69, Lockhart 78644 |
| 512 756-4680 | LONGHORN CAVERN Concessioner, Rt. 2, Box 23, Burnet 78611 |
| 512 966-3413 | LOST MAPLES HC01, Box 156, Vanderpool 78885 |
| 512 644-2252 | LYNDON B. JOHNSON Box 238, Stonewall 78671 |
| 806 762-6411 | MACKENZIE Director, Parks & Recreation, City Hall, Lubbock 79408 |
| 915 533-5147 | MAGOFFIN HOME 1120 Magoffin Avenue, El Paso 79901 |
| 214 836-4336 | MARTIN CREEK, Route 2, Box 20, Tatum 75691 |
| 409 384-5231 | MARTIN DIES, JR. Route 4, Box 274, Jasper 75951 |
| 512 983-2215 | MATAGORDA ISLAND P.O. Box 117, Port O'Connor 77982 |
| 512 243-1643 | MCKINNEY FALLS 7102 Scenic Loop Road, Austin 78744 |
| 817 435-2536 | MERIDIAN Box 188, Meridian 76665 |
| 409 687-2394 | MISSION TEJAS Route 2, Box 108, Grapeland 75844 |
| 915 943-2092 | MONAHANS SANDHILLS Box 1738, Monahans 79756 |
| 409 968-5658 | MONUMENT HILL/KREISCHE BREWERY Route 1, Box 699, La Grange 78945 |
| 817 853-2389 | MOTHER NEFF Route 1, Box 58, Moody 76557 |
| 512 749-5246 | MUSTANG ISLAND P.O. Box 326, Port Aransas 78373 |
| 817 729-5253 | OLD FORT PARKER Route 3, Box 746, Groesbeck 76642 |
| 512 672-3266 | PALMETTO Route 5, Box 201, Gonzales 78629 |
| 806 488-2227 | PALO DURO CANYON Route 2, Box 285, Canyon 79015 |
| 512 868-7304 | PEDERNALES FALLS Route 1, Box 31 A, Johnson City 78636 |
| 512 943-1172 | PORT ISABEL LIGHTHOUSE P.O. Box 863, Port Isabel 78578 |
| 512 552-4402 | PORT LAVACA Concessioner, P.O. Box 434, Point Comfort 77979 |
| 817 549-1803 | POSSUM KINGDOM Box 36, Caddo 76029 |
| 214 425-2332 | PURTIS CREEK Route 1, Box 506, Eustace 75124 |
| 512 761-9807 | QUEEN ISABELLA Concessioner, P.O. Box AK, Port Isabel 78578 |
| 214 683-5126 | RUSK/PALESTINE Route 4, Box 431, Rusk 75785 |
| 214 785-5716 | SAM BELL MAXEY HOUSE 812 South Church Street, Paris 75460 |
| 713 479-2431 | SAN JACINTO BATTLEGROUND 3523 Highway 134, La Porte 77571 |
| 713 479-2019 | SAN JACINTO MONUMENT 3800 Park Road 1836, La Porte 77571 |
| 409 971-2559 | SEA RIM/SABINE PASS BATTLEGROUND P.O. Box 1066, Sabine Pass 77655 |
| 915 292-4464 | SEMINOLE CANYON P.O. Box 820, Comstock 78837 |
| 713 456-9350 | SHELDON LAKE Route 5, Box 563A, Houston 77044 |
| 214 935-3044 | STARR FAMILY HOME 407 West Travis, Marshall 75670 |
| 214 683-2561 | STATE RAILROAD P.O. Box 39, Rusk 75785 |
| 409 885-3613 | STEPHEN F. AUSTIN P.O. Box 125, San Felipe 77473 |
| 214 597-5338 | TYLER Route 29, Box 29030, Tyler 75706 |
| 409 345-4656 | VARNER-HOGG Box 696, West Columbia 77486 |
| 409 878-2214 | WASHINGTON-ON-THE-BRAZOS Box 305, Washington 77880 |

# Fee Schedules *See chart on P6*

All fees subject to change without notice.

**A. Park Entrance Fees**

1. per motor vehicle (includes aircraft) ..... $ 2.00 per day
2. per person—applicable only when park entry is on bicycle, foot, or boat
   - Adults ..... $ .50 (each) per day
   - 12 yr. & under ..... $ .25 (each) per day
3. Buses (passenger-carrying)

| | # of Persons | Cost |
|---|---|---|
| Adults | 1–11 | $ .50 ea. (min. $2.00) |
| | 12–47 | $ 6.00 per bus |
| | 48 or more | $10.00 per bus |
| 12 years of age & under | 1–29 | $ .20 ea. (min. $2.00) |
| | 30 or more | $ 6.00 per bus |

Holders of Parklands Passport are not counted in determining occupancy of a bus.

**B. Historic Sites Fees**

Adults ..... $ 2.00
Children 6–12 yrs ..... $ 1.00
Under 6 yrs ..... Free
*Charge is only for conducted tours
All student groups sponsored by colleges, universities and public or private schools offering accredited courses are admitted for a single fee of $1.00 for the entire group.

**C. Historic Sites Fees**

Adults ..... $ 1.00
Children 6–12 yrs ..... $ .50
Under 6 yrs ..... Free
Buses (20 min) per person ..... $ .50
*Charge is only for conducted tours
All student groups sponsored by colleges, universities and public or private schools offering accredited courses are admitted for a single fee of $1.00 for the entire group.

**D. Fishing Piers**—$1.00 per rod, pole, throwline, etc. Valid for 24-hour period beginning at 5 a.m. on day fee is paid.

**E. Purtis Creek**—boat fee is $5.00 per day. Maximum of 50 boats on the lake. Call the park for reservations.

**F. Longhorn Cavern**

Adults ..... $ 5.00
4–12 yrs ..... $ 3.25
Under 4 yrs ..... Free
Organized Groups (min. 20 persons) ..... $ 2.50 per person

**G. Colorado Bend**—user fee

Adults ..... $ 2.00 per day
Children 6–12 yrs ..... $ 1.00 per day
Under 6 yrs ..... Free
Maximum 300 vehicles

Laurence Parent

*Youngsters trace the outline of a dinosaur footprint in the Paluxy River. The prints and a newly installed exhibit to interpret the ancient history of this region near Glen Rose are part of Dinosaur Valley State Park.*

**H. Cassells Boykin**

Campsites ..... $ 4.00 per day

**I. Train Fares**
(State Railroad State Historical Park only)

Adult—round trip ..... $ 8.00
Child—round trip ..... $ 6.00
Adult—one way ..... $ 6.00
Child—one way ..... $ 4.00
2 yrs of age & under ..... Free
(Child rate applicable to 3 yrs. through 12 yrs.)
Reservations: stop by, write, or call toll free (Texas only) 1-800-442-8951 8 a.m. to 5 p.m. daily

**J. Indian Lodge** (Davis Mountains State Park)

Single ..... $30.00
Double ..... $35.00
Double w/two beds ..... $40.00
Suite w/two beds ..... $45.00
Each additional adult ..... $ 5.00
Each additional child 6–12 yrs ... $ 2.00
Children under 6 ..... Free
(Includes towels, linens, maid service, telephone and television)
Indian Lodge is closed for a two-week period beginning the second Monday in January of each year.
Check-out time is 12 noon.
Hotel tax applicable.

**K. San Solomon Springs Courts**
(Balmorhea State Recreation Area)

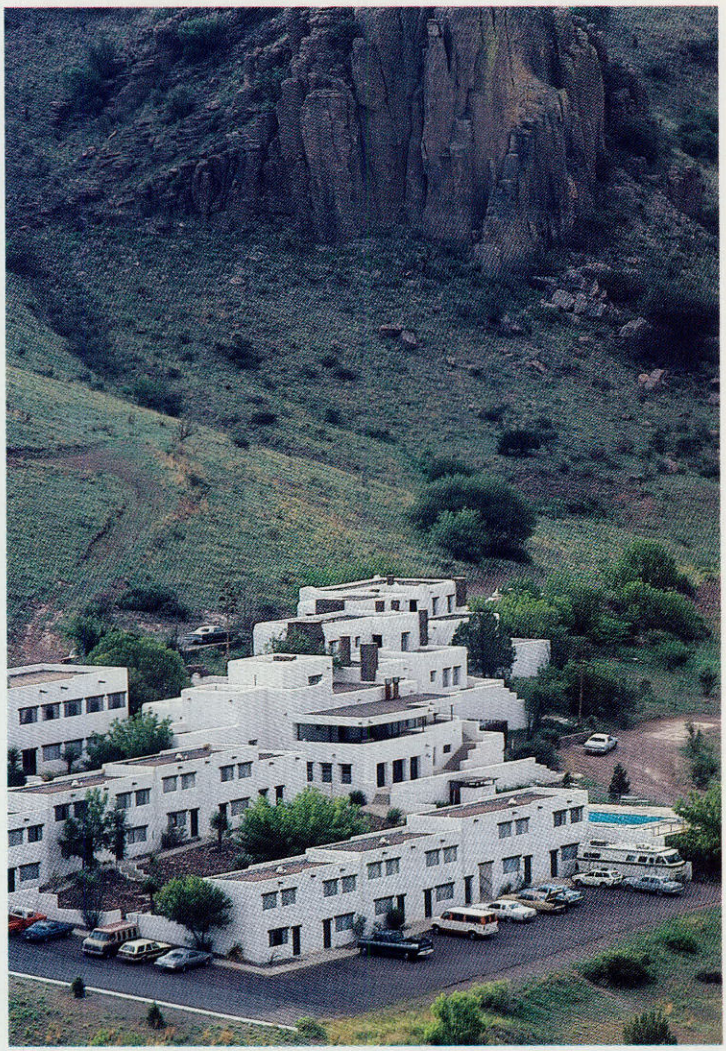
One person ..... $25.00
Each additional adult ..... $ 5.00
Each additional child 6–12 yrs ... $ 2.00
Children under 6 ..... Free
Extra cost for kitchen unit ..... $ 5.00
(Includes towels, linens, and television)
Check-out time is 2 p.m.
Hotel tax applicable.

**L. Landmark Inn**

One person ..... $25.00
Double (2 persons) ..... $30.00
Each additional child 6–12 yrs ... $ 2.00
Children under 6 ..... Free
(Includes towels and linens)
Check-out time is 12 noon.
Hotel tax applicable.

**M. Cabins**

1–2 persons ..... $25.00
Each additional adult ..... $ 5.00
Each additional child 6–12 yrs ... $ 2.00
Children under 6 ..... Free
(Includes towels and linens)
Check-out time is 2 p.m.
Hotel tax applicable.



Leroy Williamson

*The pueblo-style Indian Lodge at Davis Mountains State Park was built by workers of the Civilian Conservation Corps back in the 1930s. The 39-room lodge offers comfortable accommodations in a serene mountain setting. Its pool is even heated to take the edge off swimming in the crisp mountain air.*

**N. Screened Shelters** ..... $12.00

Electrical service and shelter capacity is limited to one family or party unit of not more than eight persons.

**O. Campsites**

Primitive ..... $ 4.00
Campsites
w/water ..... $ 6.00
w/water, elec ..... $ 9.00
w/water, elec, sewer hookups .. $10.00

Note: Fees based on type of site occupied regardless of utilities used. Capacity requirements will be observed; parties requiring larger accommodations must obtain additional facilities.

# Rules and Regulations

## Summary of regulations governing the use of Texas State Parks, Historic Sites, Scientific Areas and Forts including encompassed waters with the incorporation of related legislative enactments

**Regulations adopted pursuant to authority granted by Acts 1971, 62nd Legislature, Regular Session, Ch. 383 (Codified as Sec. 13.101–13.110, Parks and Wildlife Code)**

A full text of the Rules and Regulations adopted by the Parks and Wildlife Commission on March 4, 1982 is available on request. For specific details on regulations refer to PWD-L-4000-000A-5/86, obtain at park headquarters

### LEGISLATIVE ENACTMENTS

The penalty for violation of a Texas State Park regulation is a Class C Parks and Wildlife Code Misdemeanor.

Sec. 12.406 Class C **Parks and Wildlife Code** Misdemeanor—An individual adjudged guilty of a Class C Parks and Wildlife Code Misdemeanor shall be punished by a fine not less than $25 nor more than $200.

These regulations may be enforced by any peace officer of this State (Sec. 13.109, **Parks and Wildlife Code**), including duly appointed employees of the Texas Parks and Wildlife Department designated as peace officers by authority of Sec. 11.019, **Parks and Wildlife Code.** A citation may be issued by these officers for violation of a regulation.

As authorized by Sec. 13.108, **Parks and Wildlife Code,** any person causing, contributing to, or directly or indirectly responsible for disruptive, destructive, or violent conduct endangering the health, safety, or lives of persons, animals, or property may be removed from a Unit of the State Park System for a period up to forty-eight (48) hours; a person may be enjoined from re-entry for a longer period for cause shown by a court of competent jurisdiction. Before removal, a person shall be placed on notice of this fact by the Park Superintendent or his subordinate and given an opportunity to correct his or her conduct.

Hunting is prohibited, except by permit (Sec. 62.061, **Parks and Wildlife Code**).

Removal of rock, earth, coal, slate, minerals or other materials without consent of the Park Superintendent constitutes theft (Sec. 31.03, **Penal Code**).

Willful damage to or destruction of State or private property constitutes Criminal Mischief (Sec. 28.03, **Penal Code**).

Archaeological sites and features are Landmarks unless otherwise designated by the State Antiquities Committee and a permit is required to alter, take or excavate the site. American Indian or aboriginal paintings, hieroglyphics, marks or carvings are protected (Sec. 191.002, **Natural Resources Code**).

Dumping of trash, sewage, or waste into or adjacent to any water is a violation of Chapter 26, Subchapter D, **Water Code.**

Disposing of trash, junk, garbage, refuse, unsightly matter or other solid waste on a public highway, right-of-way, other public property or into inland or coastal waters without written consent of the owner, agent, or official in charge, is a violation of Sec. 2.01, **Litter Abatement Act,** Revised Civil Statutes, Art. 4477-9a.

Disorderly conduct is prohibited (Sec. 2.01), **Penal Code**).

All Texas laws governing the operation of motor vehicles are applicable within a State park.

All provisions of Title 4, **Parks and Wildlife Code,** concerning water safety provisions apply to lakes and waters in a State park.

### REGULATIONS—GENERAL

1.03 Payment of an entrance fee is required to enter a State park.

1.04 Payment of a user fee is required for use of most facilities. A facility may be used only for its intended purpose. Only authorized equipment may be used at a facility.

Stephan Meyers

*This young angler will be plenty surprised if he hooks a "bull" red in the surf at Sea Rim State Park. Fishing by anglers of all ages is one of the main attractions to Sea Rim near Beaumont. In addition to red drum, whiting and speckled trout can be caught in the surf. Sea Rim's marshland lake system has abundant reds, trout, croaker and sheepshead.*

Stephan Meyers

*The clear waters of the Frio River run through Garner State Park. The river's cypress-lined banks are popular with swimmers, canoeists and tubers.*

1.05 Facility users may not exceed the maximum limit of persons, vehicles, and equipment established for a facility. Only the type of vehicles, trailers and equipment designated for a facility may be used.

1.06 Facility users may not occupy a facility past an established checkout time unless it is determined that the facility is not needed for incoming visitors.

1.07 Wildlife within a park is protected and may not be harmed, harassed, caught, possessed, removed, or hunted except by permit.

1.08 Plants, trees and dead wood are protected and may not be damaged or removed from a park.

1.09 Fires may be built only in camp stoves or fireplaces. Firewood may not be gathered unless authorized by the Superintendent. Fireworks and explosives are not permitted.

1.10 Pets must be secured by a leash of six feet or less or confined. Pets other than seeing eye dogs are not permitted in public buildings or swimming areas. Horses may be ridden only in areas designated for that purpose. Noisy, vicious or dangerous animals are not permitted.

1.11 Loaded firearms are prohibited. Discharging a firearm or other hunting device is prohibited unless during authorized hunting by special permit or by law enforcement personnel.

1.12 During posted closing hours, unauthorized persons may not enter or remain in a park.

1.13 An assembly or a demonstration may be held only after written authorization.

1.14 Public nudity or disrobing is prohibited.

1.15 When notice is posted declaring an area or facility closed to public entry or use, unauthorized persons may not enter or remain in the closed area.

1.16 No alcoholic beverages may be sold or publicly consumed.

1.17 Solicitation of funds, distribution of circulars, and the sale or offer of sale of any item may be done only after a permit or written concession contract has been issued.

1.18 Use of metal detectors is prohibited.

1.19 Adults may not permit a minor under their supervision to violate these rules.

1.20 A vehicle or other property that is abandoned or unattended and creating a hazardous or unsafe condition, or in an unauthorized place is subject to removal, impoundment or sale, as provided by law.

## VEHICLES

2.01 Speed limits on park roads may not be exceeded. Speed may not be excessive for the conditions.

2.02 Vehicles may not be operated except upon roads and parking areas open to vehicles.

2.03 Vehicles and trailers must be parked only in parking areas designed, constructed or designated for parking.

2.04 Two and three-wheeled motorized vehicles must be equipped with an unmodified street legal muffler and a U.S. Forest Service/U.S.D.A. approved spark arrester/exhaust system. They may be operated only in areas designated for their use and at posted times. A street legal bike may be operated by a licensed operator on park roads open to vehicular traffic. Indiscriminate operation of vehicles is prohibited. Pedestrians, bicycles and horses are prohibited from using mini-bike trails.

2.05 Use of a motor vehicle or bicycle on a pedestrian trail is prohibited.

2.06 Vehicle traffic between the park closing hour and 6 a.m. is for emergency or necessary purposes only. Indiscriminate traffic in camping areas is prohibited.

## CAMPING

3.01 Campers must obtain a camping permit (1.04) and not exceed the established limit for the number of persons and the type and number of vehicles and equipment at the facility (1.05), and may camp only in a facility designated for that purpose.

3.02 Continuous occupancy of camping facilities by the same person or group is limited to 14 consecutive calendar days, unless an alternate time limit has been established or unless the occupied facility is not needed for incoming park visitors.

3.03 Persons under 18 years of age may stay overnight only if they are accompanied by parent or legal guardian or with his/her written permission, or if in a group supervised by a responsible adult for each 15 persons under 18 years of age.

3.04 Noise may not be broadcast into the camp or sleeping quarters of another visitor between 10:00 p.m. and 6:00 a.m. Electronic broadcasts must be confined to the camp or picnic area of the person creating the sounds at all times. Excessive noise and disturbing conduct are prohibited.

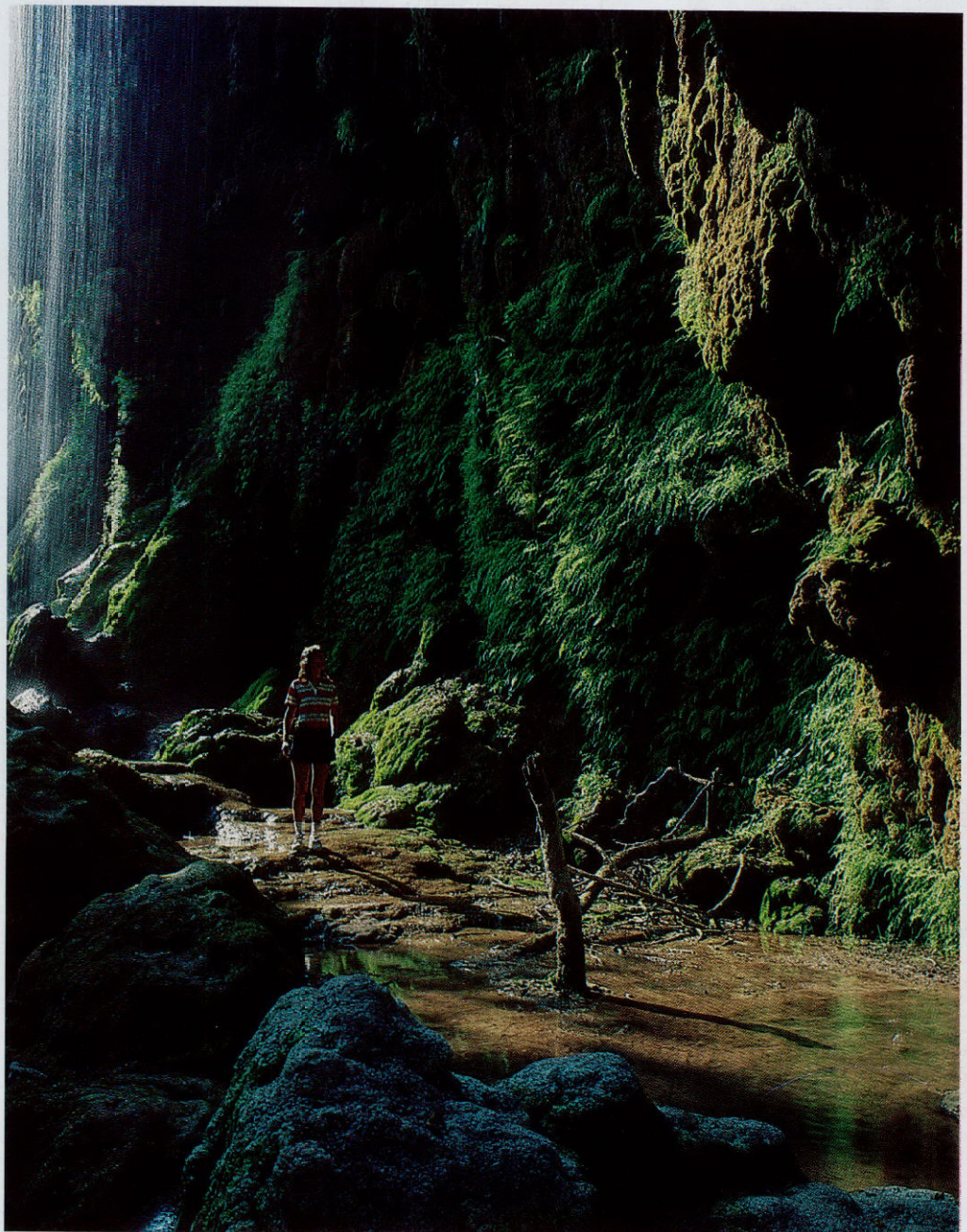
## WATER SPORTS

4.01 Swimming is restricted to designated areas and daylight hours. Water skiing, similar activities and operating a motorized ski device on lakes of less than 650 surface acres located in a State park are prohibited.

4.02 Boats may be docked only at designated mooring areas between 10 p.m. and 6 a.m., except by permit.

4.03 Glass containers are not permitted in the water of, or on the beach adjacent to, a swimming area.

Stephan Myers



Laurence Parent

*Gorman Falls at Colorado Bend State Park*

# Outdoor Roundup *Continued from page 16*

## Texas Fishing Called a $4.1 Billion Industry

Sport fishing in Texas' fresh and salt waters is a $4.1 billion annual industry, according to the Texas Parks and Wildlife Department.

Dr. Gary Matlock, director of TPWD's Fisheries Division, told members of the Texas Outdoor Writers Association at their annual meeting in Kerrville during January that the $4.1 billion estimate was prepared by department economist Robin K. Riechers.

"This kind of figure serves to point out the importance of fishing to the state's economy," Matlock told the writers. "It's even more impressive to consider that it reflects only direct fishing trip expenditures. If you add boats, motors, trailers and associated equipment, the figure climbs into the $10 billion plus range."

Matlock explained that the estimates are based on a formula using baseline data from the 1980 National Survey of Fishing, Hunting and Wildlife-Associated Recreation conducted by the U.S. Fish & Wildlife Service, and preliminary data from recent statewide surveys of both fresh and saltwater fishermen. The survey's estimated expenditures by recreational fishermen in Texas were adjusted to 1987 levels by using the federal Consumer Price Index.

The analysis of the U.S. Fish & Wildlife data showed the economic impact of inland sport fishing was $2.9 billion, while coastal fishing showed a total of $1.2 billion. When saltwater commercial fishing activity is added, the total statewide economic impact rises to $4.8 billion, Matlock said.

Matlock said the TPWD's role in this multi-billion-dollar arena involves regulation of harvest, stocking of sport fish and protection and enhancement of the habitat needed by fish.

One of the department's major accomplishments of the past decade has been establishment of the GCCA/CPL Marine Development Center at Corpus Christi. "With the participation of private industry and conservation organizations we have been able to produce and stock more than 100 million red drum, mostly fry, in Texas' bay systems," Matlock said. He added that the department also now has one of the nation's most modern freshwater hatchery facilities in the new A. E. Wood facility at the San Marcos Hatchery.

## 1988–89 Texas Deer Harvest May Show Downturn

After four years of record white-tailed deer harvests, hunting may have returned to more normal levels during the 1988 regular season, according to the Texas Parks and Wildlife Department.

Horace Gore, white-tailed deer program leader, said he expects the harvest to be 10 to 15 percent below the 1987 harvest of approximately 505,000 deer. "Judging from field reports it appears hunting was slow because of weather conditions," Gore said.

Unusually warm, windy conditions prevailed during much of the early part of the deer season when the largest numbers of hunters traditionally are in the field. "There was less deer movement than normal because of the warm weather and a surprisingly good acorn crop in many areas," Gore said.

Dry weather also had a negative effect on hunting, as oat patches and other food plots failed to produce enough greenery to attract deer in numbers, he added.

Deer movement in some regions was reduced to the point that some landowners were concerned about overharvest, especially in East Texas where the either-sex system of bag limits went into effect for the first time. "Our field biologists have kept tabs on the deer population, and they believe the difficulty in seeing many deer is caused by a lack of deer movement and not a scarcity of deer," Gore explained. "The deer are present in high numbers just as they were last year."

Gore speculated that even if the harvest dropped 12 percent from the 1987 total, it still would be equal to the 1986 harvest. "We had such good range conditions during the mid-1980s it almost became automatic that the harvest would set a record every year," Gore said. "It seems the harvest this year is simply returning to a realistic level, mainly because of weather conditions."

Leroy Williamson

*These East Texans may not have spent much money to catch a mess of crappie, but fresh and saltwater fishermen as a group shell out some $4.1 billion annually to enjoy their favorite pastime.*

## Wildflower Day Slated at McKinney Falls Park

State parks officials are planning a colorful "Wildflower Day" at McKinney Falls State Park near Austin on April 8 from 8 a.m. to 5 p.m.

Joining the Texas Parks and Wildlife Department in conducting the event will be representatives of the National Wildflower Research Center and the Texas Department of Highways and Public Transportation.

Planned events include wildflower tours and lectures, displays of live wildflowers, wildflower art, special activities for children and a photography workshop. As many as 100 specimens of wildflowers will be displayed at park headquarters, and a talk will be given on planting and selecting wildflowers for home use.

McKinney Falls State Park is located approximately 13 miles southeast of the State Capitol at the confluence of Onion and Williamson Creeks. To reach the park from Interstate Highway 35, take the William Cannon exit east to the Nuckols Crossing intersection; go straight, then turn left on Bluff Springs Road which becomes Scenic Loop Road. The park entrance is on the left. From U.S. Highway 183, take Scenic Loop Road west to the park entrance.

All standard entrance and facility use fees will apply, but the wildflower day activities will be free.

## Fanthorp Inn Hosts Celebration of Methodism

The public is invited to Fanthorp Inn State Historic Site in Anderson on April 29 to commemorate the 150th birthday of the First United Methodist Church of Anderson. The event is scheduled for 11 a.m. to 4 p.m.

Visitors are asked to bring a picnic lunch. Park Superintendent Jo Frances Greenlaw said tours of historic Fanthorp Inn are $1 for adults and 50 cents for children 6–12.

Fanthorp Inn is located about three blocks south of the Grimes County Courthouse in downtown Anderson. For further information call the park at 409-873-2633.

Grady Allen

by John Peslak, Jr.

# If it whistles like a duck . . .

Several years ago, I was in a photo blind next to a South Texas stock tank when I heard an odd whistling overhead: *pee-chi-chi-nee*. Shortly, six ducks unlike any I had seen before skimmed like skiers across the water's surface. My camera's motor drive whined and I had photographed my first black-bellied whistling ducks.

Blackbellies are common to the tropical lowlands of Mexico and Central America. The northernmost birds are migratory, visiting Texas from April through early October. This is an unusual duck, not only because it whistles but also because it walks with an assured stride on land.

The blackbelly can balance on the most precarious perches such as strands of barbed wire, and it can even maneuver down vertical tree trunks. Both sexes are identical in appearance. They have an elegant chestnut plumage with a black breast, a coral red bill and long pink legs. Like geese, they mate for life. Indeed, the black-bellied whistling duck shares a number of behaviors with the geese and swans. This is reflected in its scientific name of *Dendrocygna autumnalis*, meaning autumn tree swan.

The blackbelly makes its living at night. During the day it catnaps in small groups nestled in the tall grass along the water's edge. Late in the afternoon, the group begins to stir. Each bird stands up, walks about and preens its feathers. To loosen tight muscles, the bird arches its back while stretching its neck. Like a ballerina performing an arabesque, its legs are alternately stretched backward while each wing is fully extended.

The duck then steps into the shallows, usually sipping some water before the serious business of eating begins. It lowers its head to the water and, looking like a vacuum cleaner, separates out seeds and bits of vegetation.

To the chagrin of farmers, blackbellies relish grain. The ducks gather at the edge of a grain field before entering en masse. Their feeding technique was described as early as 1878: "When corn is nearly ripe, . . . (the black-bellied whistling ducks) alight on the stalks, strip the ears of their husks and pull grain from the cob, making this their chief food during the season." As a matter of fact, in Mexico they are called *patos maizal*, cornfield ducks.

The breeding season brings the black-bellied whistling duck to Texas each spring. Unlike other migrants, which often begin nesting soon after their arrival, the blackbelly's nesting and brood rearing season extends from May to October.

About a week before egg laying begins, the birds look for a suitable nest site, usually in the area they used in previous years. Selection of a site is a family decision. The pair lands on a perch and scrutinizes the area for likely possibilities. Although the ducks nest on the ground, they look for cavities about four feet high and within 50 feet of water in old ebonies, hackberries, live oaks and mesquites.

If they spot a good hole, one of the pair flies over to it. The bird climbs down to it and with an outstretched neck, studies the opening. If it passes inspection, the birds take turns entering for further examination. They usually consider several sites before making a final decision. Only the birds know for sure how this is done, but the need for a nearby perch is important.

Blackbellies nest in loose colonies and

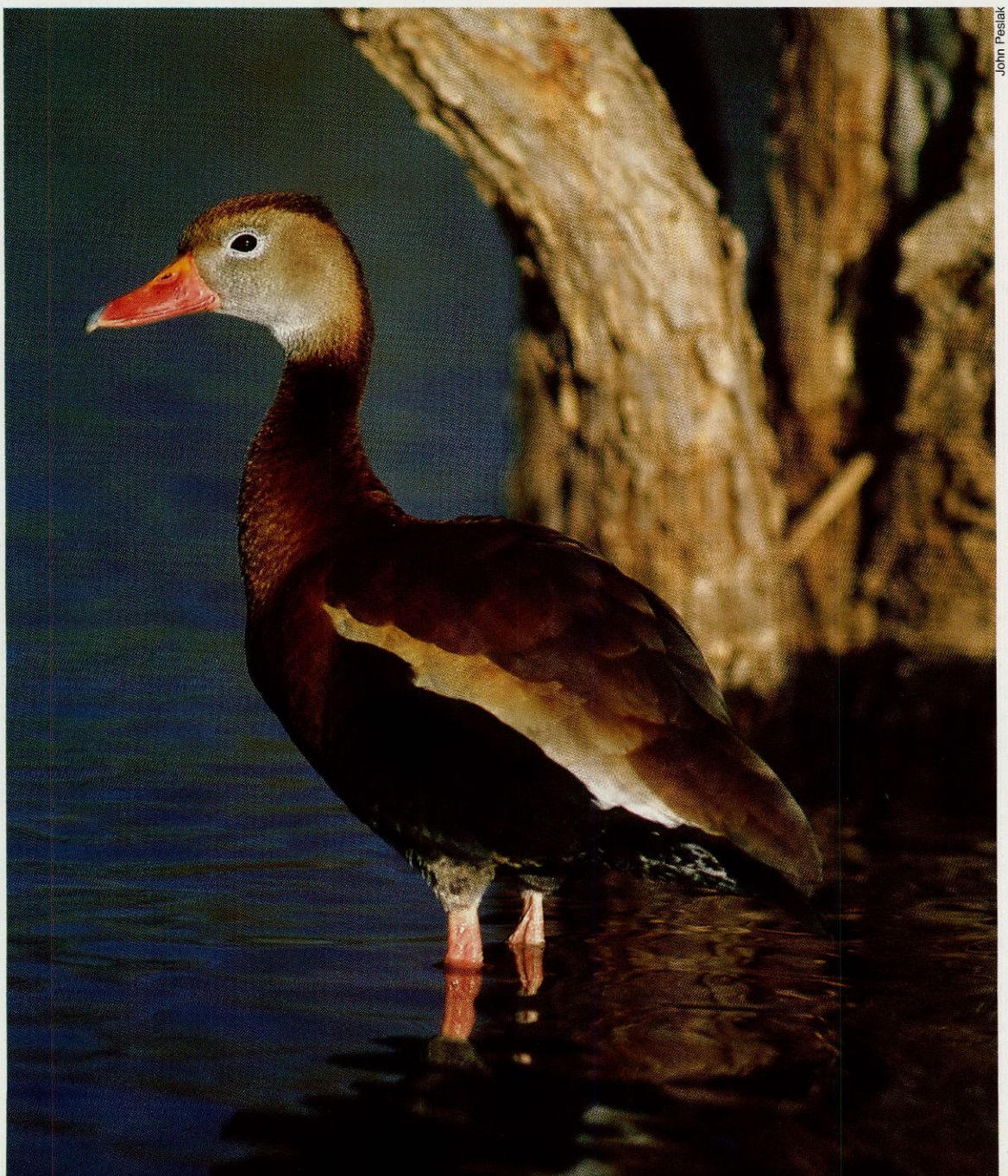
*Black-bellied whistling ducks are unusual in several respects, not the least of which is the odd whistling noise they make. These elegant looking birds have chestnut plumage, a coral red bill and long pink legs.*

a comical sidelight to nest selection occurs when more than one pair eyes the same cavity. The scene resembles a large family waiting to brush their teeth in a single bathroom. The birds take turns entering the hole and squabbles inevitably occur, with the dominant birds driving the others away. Two birds may, nonetheless, be insistent enough to try squeezing into a cavity big enough only for one.

After ownership of a hole is established, the hen lays one chickenlike egg each day until 12 to 16 eggs rest on the cavity's bare floor. Oddly enough, she and her mate may end up incubating many more. The black-bellied whistling duck is a "dump" nester, meaning more than one hen may lay eggs in the same nest. It is not known why some of the birds dump their eggs in another nest, but it can become ridiculous. For example, one nest was found with 17 eggs; two days later it had 50. However, the parade didn't stop there. A week later, one gallant bird was trying to cover a mound of 90 eggs. Although raccoons and snakes eat blackbelly eggs, it is this dumping that causes the greatest egg loss because the sitting bird cannot properly incubate them all.

Both sexes incubate the eggs in 24-hour shifts, changing places in the nest with little ceremony. The incubating bird often flies out to its loafing mate, which then returns to the nest. Because of this close sharing of nest duties, the death of one parent causes the other to abandon the eggs.

When incubation is successful, the youngsters hatch in 28 days. In one of those romantic natural history descriptions common in the 1800s, yet completely wrong, it was said: " . . . the young are lowered to the ground



John Peslak

John Peslak

one at a time in the mouth of the mother; after all . . . (are) safely landed she then cautiously leads her young to the nearest water."

Actually, the black and white striped babies, often called "little convicts," are precocial, meaning they are fully active as soon as they hatch. When called by the hen, the chicks jump out of the nest and are led to water.

The first week or so is a dangerous period for the ducklings. Looking like little wind-up toys, they energetically search the water's surface for plant matter and spiders. The parents try to protect their charges by convoying them about with one adult in front and the other in the rear. If a predator appears, one parent attempts to distract it by flopping off as if injured while the other leads the ducklings to safety. Nevertheless, up to 30 percent of the brood will be lost during the first week.

The family unit remains together throughout the summer. Prior to returning to Mexico in September or October, it joins other blackbellies to form flocks of up to several thousand birds.

Such numbers of black-bellied whistling ducks are a recent phenomenon in Texas. Early in this century, the bird was localized in the lower Rio Grande Valley. However, since 1955, it has experienced a dramatic range extension along a line from Del Rio to San Antonio to College Station to Madisonville to Beaumont.

For example, San Antonio had its first blackbelly sighting in 1958. In 1964, 800 birds were spotted around Lake Corpus Christi, and in 1972, they nested for the first time in Brazos County. The Attwater Prairie Chicken National Wildlife Refuge had its first brood in 1979, and a brood was first seen in Uvalde County in 1980. Today, the TPWD's annual fall survey of the species finds flocks of up to 6,000 birds.

The experts are not sure why the blackbelly's numbers have increased in Texas, but the TPWD recognizes that this population increase offers an opportunity for Texas hunters. Blackbellies have been legal game since the 1984–1985 waterfowl season, but the opportunity to bag one has been limited since most of the birds return to Mexico before the season opens. If the population continues to increase, however, the department hopes to open a September season.

To increase production of the bird, the TPWD participates in a cooperative nest box program with the Houston group, Waterfowl Habitat Alliance of Texas (WHAT Ducks) and the Texas Forestry Association. These groups supply materials for the boxes, which are assembled by the Texas Department of Corrections Unit at Palestine. The TPWD then handles applications for the boxes from interested landowners and distributes them, along with support poles and predator guards, free of charge.

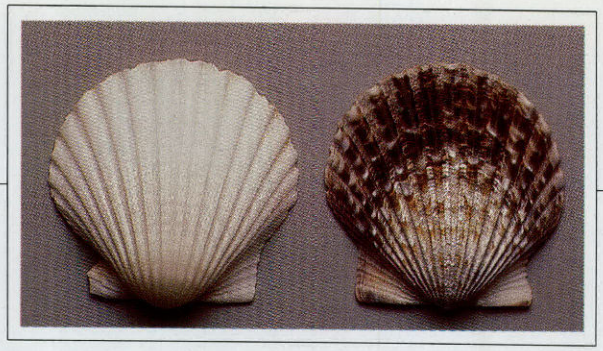
If you would like to participate in this effort, you need suitable habitat: shallow wetlands, ponds or manmade lakes with heavily vegetated margins. Also, for a nest box program to be successful there must be a local breeding population of blackbellies. If you have seen the birds in spring or summer in your area, they probably have been breeding nearby.

If you are interested in having these boxes on your land and are willing to maintain them, contact the Texas Parks and Wildlife Department for an application. The address is 4200 Smith School Road, Austin, Texas 78744. Not only will you enjoy seeing these beautiful birds, you also will be contributing to hunting in Texas and the enjoyment of guys like me who like to photograph our state's wildlife. **

Joe V. Corso, Jr.

Steve Bentsen

*The black and white striped chicks (below), often called "little convicts," are precocial, meaning they are active as soon as they hatch. As the chicks grow they lose the stripes (left), but they don't develop the colorful bills and legs until adulthood. Late in the afternoon the ducks preen, stretch and sip water before eating (opposite).*



# Scallops

Article by Barbara Dunn and Photos by Stephan Myers

They roll in with the foamy lapping of incoming tides. When the water rushes back and percolates away, they are left glistening and quiet in the sun. In ancient civilizations scallops were used as tools and currency, while today they are gathered for decorations and collections. They are the remnants, the shells, of one of the largest animal kingdoms on Earth.

In late summer, the locals around Corpus Christi drive out to the Laguna Madre equipped with buckets and ice chests. They take off their shoes and wade into the lagoon, often using snorkels and masks to peer through the three-foot deep water in search of small, two-inch depressions in the sand. Burrowed in these holes are bay scallops. When the scallops detect the fishermen approaching they jump into a flurry of activity, jetting away in a series of silent clackety-clacks.

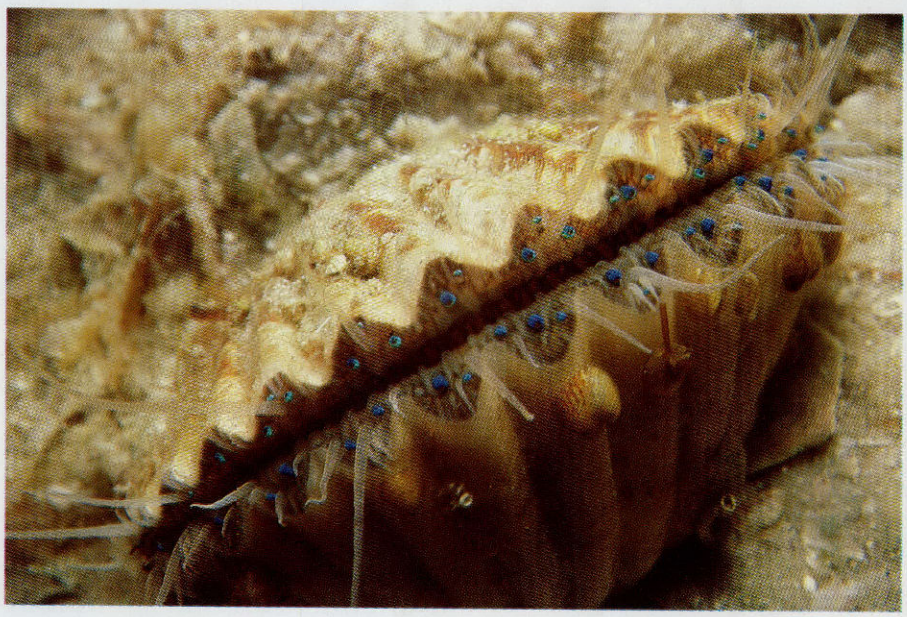
Two of the scallops found in the Laguna Madre are the calico scallop, *Argopecten gibbus* and the blue-eyed scallop, *Amplicostatus*. They are subspecies of the Atlantic bay scallop. The calico scallop is found on the East Coast, Bermuda and from South Texas to Brazil. The blue-eyed scallop is found from Central Texas to Mexico and Colombia. They live in eelgrass beds and sandy-mud bottoms near the low-tide line and below in shallow water.

These scallops are part of the mollusk phylum. It is the most adaptive of all the animal groups and its 100,000 species are found everywhere—from the deepest oceans to the highest mountains, in the Arctic and in the tropics. Mollusks range in size from the barely visible sea snail to the 60-foot long giant squid.

Earliest mollusk fossils date back 600 million years to the Cambrian period. Modern classes were distinct by 500 million years ago. The bivalves, named after their two valves or shells, are the second largest class of mollusk and include scallops, clams, oysters and mussels. They are also known as the Pelecypoda, meaning "hatchet foot." They live in salt water and fresh water, and are well adapted for burrowing in the mud.

The bay scallop's evolution did not parallel that of its mollusk relatives. Instead of becoming more complex, the scallop lost is head and its foot. Its internal anatomy became more centered on feeding instead of reproduction or circulation.

The valves, or shells, of the bay scal-



*The bay scallop has well-developed eyes that are set in rows alongs the edge of the mantle. These eyes are bright blue and each has a lens, retina and optic nerve. Scallop shells are variable in color and mottled, combining white, red, purple, brown, orange and yellow.*

lop are some two inches wide. They are joined at a hinge and held together by a horny ligament, and movement of the shells is controlled by a large adductor muscle. Their color is highly variable and mottled, combining white, red, purple, brown, orange and yellow. They appear furry under the water because the upper shell is usually coated with algae.

The mantle is the scallop's major shell-producing organ. It lies inside the shell and forms a pocket in which the internal organs lie. It is lined with a network of tiny tubes, which secrete particles of calcium carbonate intermittently, giving the shells their characteristic ribbed surface. The mantle also contains chromogenic cells which secrete pigment.

Inside the edge of the shells lie curtains of tissue from top and bottom which meet and enclose a water chamber. Just outside of these curtains is a fringe of small tentacles which monitor the water flowing into the body cavity. The tentacles are sensitive to large objects, and if something too big to be eaten bumps against them, the shells shut tight.

Bay scallops are filter feeders. Water passes through the gills as it flows into the body cavity. The gills perform the dual function of absorbing oxygen and straining tiny one-celled plants, animals and bacteria (plankton) from the water. Their gill surfaces are covered with cilia to circulate water and they secrete mucus for cohesion of food particles.

The bay scallops themselves are part of the plankton population in their early stages of life. Eggs are fertilized in the water and form planktonic larva. These are free-floating organisms which have not yet formed a hard shell. This method of reproduction is important for dispersal, yet millions of larva become prey for other filter-feeding organisms during their journey on the ocean currents. They are fed upon by stone crabs, black drum, sheepshead and sting rays. When the survivors grow a shell, they settle down to begin an adult life burrowed in the mud. At the Laguna Madre, they can usually be spotted around April and are ready for harvest by late summer.

At low tide adult scallops become prey for gulls. Laughing, herring and ring-billed gulls pick up the shells and carry them upward 30 feet or more, and then drop them. The fall causes the shells to split open, exposing the soft inner organs to the gulls.

*The Laguna Madre (above) is good bay scallop habitat. These unusual bivalves live in sandy-mud bottoms near the low-tide line and below in shallow water.*

The bay scallop is an unusual bivalve because it has eyes and it can swim. The eyes are well-developed and set in rows along the edge of the mantle. They are bright blue and each has a lens, retina and optic nerve. The eyes are quick to detect shadows, giving the scallop time to swim away from danger. The strong adductor muscle vigorously opens and closes the valves in a clapping fashion, expelling water from the mantle cavity in quick jets. The scallop can swim three to five feet at a time.

Scallops are usually unaffected by shellfish harvest closures because they are not eaten whole and raw like oysters. Other bivalves such as oysters may not be harvested during such closures because they may ingest toxic materials in the water.

Curiously, the population of bay scallops varies widely at the Laguna Madre. In some years there are millions, in others, practically none. Rick Tinnen, head of the Marine Science Institute in Port Aranasas, says, "There is no set cycle. The numbers are related to a variety of environmental factors such as salinity, freshwater inflow and nutrients." Average saltwater salinity is 35 parts per thousand. Tinnen has found bay scallops living as high as 48 parts per thousand in the Laguna and 26 parts per thousand in Galveston Bay.

The only edible part of the bay scallop is the adductor muscle. Scallop harvests in the Laguna Madre are regulated by the Texas Parks and Wildlife Department, which requires fishermen to have a fishing license with a saltwater stamp. There is no bag limit. If scallops are collected commercially, a commercial fishing and boating license is required. However, the high variability of their abundance, as well as the localized nature of the existing populations, probably precludes the development of a commercial fishery for bay scallops.

There are few people who travel to or live along the coast who have not met a live bay scallop or its remains. Every child and adult enjoys strolling along the sand, head down, intent on finding the biggest and most colorful shell to add to their collection. Although in life scallops are harvested for the preparation of popular meals, it is in death that their shape and beauty have been most appreciated. **

Stephan Myers

 by Ilo Hiller

# Molting and Metamorphosis

## *When animals change their skins*

Molting is defined as periodically casting off an outer covering. Such a definition oversimplifies a process that can be so varied and fascinating to observe.

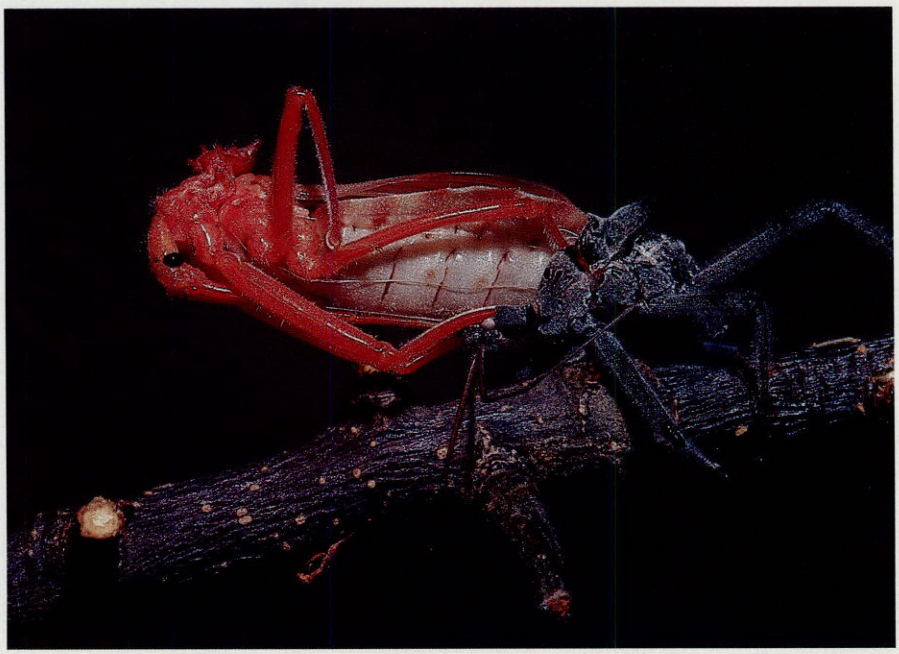
If we look closer at the process of molting (sometimes called shedding), we discover that most animals, including humans, do it in some form or another. Although we may not notice it, we are constantly shedding our outer skin as dried cells flake off. A more obvious molt for mammals takes place when they replace their summer and winter coats of fur.

Birds molt at least once a year, replacing all of their old, worn feathers in a definite pattern over a period of several weeks. They often appear ragged or scruffy during the process. Some birds have seasonal molts, changing the coloration of their feathers between summer and winter to help them blend into their surroundings. Others take on brilliant colors during the breeding season. Young birds may go through a series of juvenile molts until they obtain their adult plumage.

Amphibians, reptiles and arthropods (insects, spiders and crustaceans) also shed their skins or shells. How often this occurs depends upon the species, time of year, location and age of the animal. Some species of amphibians eat their cast-off skin. Reptile skins are often picked up by a bird and used as nesting material. Beach visitors may find the cast-off shells of crabs while collecting sea shells.

Some of the most interesting and easily observed molts occur among the insects. Growth in insects is not a gradual process as it is with many other animals. Insect bodies are covered with a hard skin, or exoskeleton, known as the cuticula. As the insect grows, this outer covering becomes tightly stretched and a new skin forms beneath it.

A special molting fluid is released between the old and new skins. This fluid, which keeps the two skins separate, dissolves some of the inner layers of the old skin. When the insect is ready to molt, the fluid containing the dissolved material from the old skin is absorbed by the new inner skin. The outer skin dries, splits and the insect crawls out of it. After the molt, while the new skin is still soft, the insect expands its body. The new skin then hardens around the insect's larger body. This process is repeated as often as needed. Some insects molt more than 20 times, others only a few.



Gwen Fidler

*Some of the most interesting and easily observed molts occur among the insects. The molt may take the form of a complete metamorphosis with a drastic body change as in the cicada (left) or it may be a gradual development in stages from immature young to adult as in the wheel bug (right).*

Molting also occurs in insects during the process known as metamorphosis.

Metamorphosis is the word used to describe the distinct changes in the body form of an animal between birth and adulthood. Two well-known examples of metamorphosis are the transformation of the tadpole into a frog and the caterpillar into a butterfly.

One advantage of metamorphosis is that it allows some species to live in two different environments during their lifetime.

The tadpole is an aquatic animal with gills for removing oxygen from the water and a tail for swimming. It feeds on plants and minute aquatic animals. When transformed into a frog it can leave the water, breathe air and feed on prey that is not aquatic, such as insects.

The caterpillar eats leaves and is well adapted for crawling around on its food plant. When it becomes a butterfly, its wings carry it from flower to flower to sip plant nectar.

Although biologists divide insect metamorphosis into five different categories, we are only going to look at two—gradual and complete metamorphosis.

Some insects go through metamorphosis in gradual stages of development from immature young (nymph) to mature adult. These stages are called instars. The nymph molts from one instar to the next, and each stage, although similar to the one before, is closer to the adult stage as features such as wings and reproductive organs develop. There is little or no change in the insect's food and habits during gradual metamorphosis and there is no pupal stage or distinct resting period before the adult stage. Grasshoppers, katydids, wheel bugs and roaches are examples of this type of insect metamorphosis. Cicadas also skip the pupal or resting stage, but fall into a different category because the food habits of the young and adult are different.

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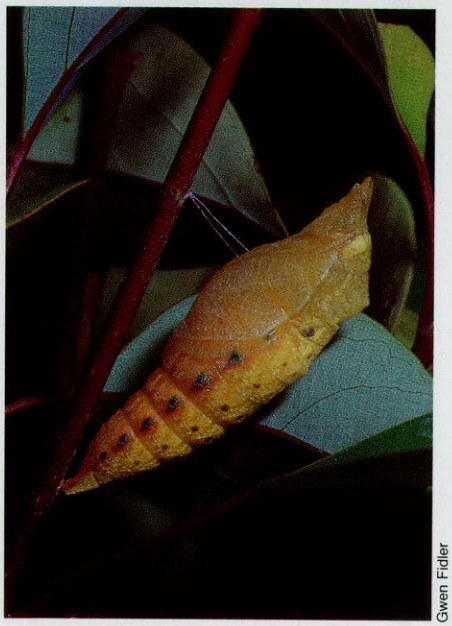

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*The young swallowtail larva will molt to its more commonly seen green phase (top left) and the caterpillar will continue to molt as needed as it grows. When it is time to begin changing into a butterfly, the caterpillar attaches itself to a twig (extreme left), sheds its outer skin as it transforms into chrysalis (left and above), molts into a pupa inside the chrysalis, is transformed into a butterfly and then emerges (right).*

Other insects go through true or complete metamorphosis, which involves dramatic changes in body form. The young insect (larva) looks nothing like the adult it will become. The larva that hatches from the egg is usually a wormlike creature that feeds and increases in size through a series of molts. Toward the end of the last larval stage the larva spins a cocoon, buries itself in the ground or hides in some other secluded location.

During this resting stage the larva begins its transformation. It molts into a pupa, which is the stage between the larva and adult. Transformation continues. (This is easy to say, but it is hard to imagine what actually takes place. The body and organs of the larva/pupa must be taken apart completely and reassembled into new organs, such as wings. One researcher described it as taking a car apart and using the materials to build an airplane.) When transformation is complete, the pupal skin is molted and the adult emerges. Butterflies, moths, bees and ants are examples of this type of insect metamorphosis

If this quick look at molting and metamorphosis has sparked an interest, you might want to do some research on your own to discover how some insects, such as mosquitos and dragonflies, spend part of their lives as aquatic creatures. **

Paul M. Montgomery

*If you are observant you may find the cast off skins of insects, such as this grasshopper exoskeleton, attached to twigs and stems. You will notice that the entire skin is molted, including the eye scales and antennae.*

Stephan Myers

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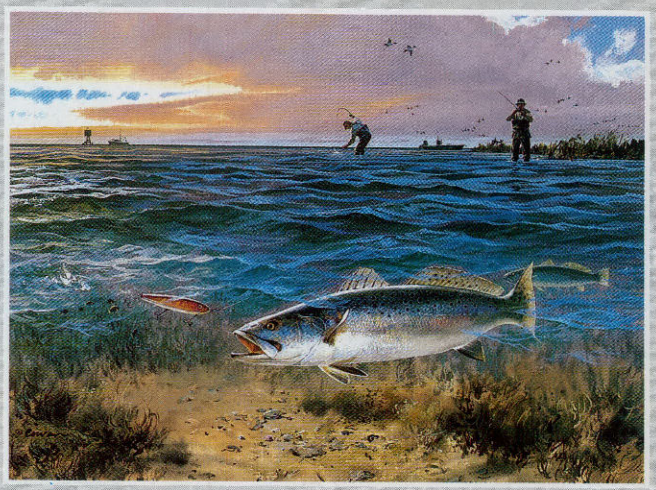

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# Letters

### Big Trees

In reference to the January 1989 article, "Stalking the Champion Trees" by Mike Blakely, it seems quite possible that the live oak pictured on page 4, along with the cottonwood on page 8, are not large, single trees, but the result of the merger of groups of saplings that have grown large enough to combine with each other.

This trait seems to be common among live oaks, which often sprout from the roots of a mother tree rather than from individual acorns. The two trees mentioned appear to originally have been five or more single trees.

The white oak on page 5 is a beautiful tree, but it would be considered an overgrown sapling in southern Maryland.

Charles D. Grundy
Colleyville

I read with interest the article "Stalking the Champion Trees," probably because I am co-owner of the new state champion Texas live oak tree.

Located in Rio Frio, not far from Bill Burditt's place, this tree often is compared to the famous Goose Island oak.

Last fall a man from the Texas Forest Service came amd measured the tree, after which he declared it to be a state (and probable national) champion Texas live oak. He said the Goose Island tree was a coastal live oak.

I lived in the shadow of this champion tree when I was a girl and have many fond memories of "tree visitors."

Eva Sanderlin
Knippa

■ It sounds like you have a very big and beautiful tree. However, recent literature recognizes both Coastal and Hill Country live oaks as being members of the same species.

We're pleased that you enjoyed the Big Trees article. Regretably, William Burditt died in December 1988 before the story was published. We wish he were here to see the story and your response to it.

### Insects in Camouflage

Your January 1989 issue was great. We especially enjoyed the articles "Stalking the Champion Trees" and "Nature's Camo."

However, we noticed two errors in the captions on pages 25 and 31. In both captions, the insects identified as walkingsticks are praying mantises.

Praying mantises have small necks and relatively large, triangular-shaped heads. They can turn their heads to look over their shoulders. Walkingsticks have blunt heads of no greater diameter than their necks.

Travis R. Aven
Yantis

Although I'm a country boy and not an entomologist, I think the two critters identified as walkingsticks in both captions are in fact praying mantids or mantises, with good camouflage.

One of my references, Swan and Papp's "The Common Insects of North America," identifies similar insects as *Tenodera aridifolia sinensis* or Chinese mantid, a species that is Asiatic in origin and probably not especially common in Texas. Another reference, Ross E. Hutchins' "Insects," has a black and white photo of what he refers to as a Chinese mantis, *Paratenodera sinensis*, next to a common local type. This foreigner bears a striking resemblance to a walkingstick species known to be common in Texas, *Diapheromera femorata*.

D. B. Gregory
Boerne

■ We had numerous readers question the walkingsticks, and they were right. Both insects identified as walkingsticks in "Nature's Camo" are indeed praying mantises. The one on page 25 is a Brunner's mantis, *Brunneria borealis*. Only females are known in this species. The photo on page 31 is a slim Mexican mantis, *Oligonocella mexicana*. The mantis in this photo is a female because only females are wingless in this species. Both the Brunner's mantis and slim Mexican mantis are common in Texas.

### Galveston Fishing

My wife and I enjoy *Texas Parks & Wildlife* magazine very much, but we would like to see more articles and photos on Galveston Beach and Galveston Bay fishing.

We are partial to the Galveston area because we have lived here for more than 65 years.

Gus E. Swanson
Galveston

■ We have a story on the Galveston area planned for 1990.

### BACK COVERS

**Inside:** Long-nosed bats, shown here pollinating an agave, are highly specialized for feeding on the nectar of desert plants. This appropriately named bat has an especially long nose and tongue, allowing it to reach deep into flowers. Some species of agave are so dependent on these bats for pollination that without them, the odds of successful seed production drop to 1/3000th of normal. Recently declared endangered, long-nosed bats in Texas are found only in the Big Bend region. (See story on Texas bats on page 2.) Photo by Merlin D. Tuttle, Bat Conservation International. **Outside:** To some outdoor enthusiasts these are tree ducks. Others call them whistling ducks or blackbellies. All three names are correct. These miniature black-bellied whistling ducks have not fully developed the elegant chestnut plumage, black breast, coral red bill and long pink legs. Blackbellies share many behaviors with geese and swans; the scientific name of the black-bellied whistling duck is *Dendrocygna autumnalis*, meaning autumn tree swan. Blackbellies can balance on the most precarious perches and maneuver down vertical tree trunks. Sexes are identical and like geese, blackbellies mate for life. Common to the tropical lowlands of Mexico and Central America, the northernmost blackbellies are migratory, visiting Texas from April through early October. (See story on page 18.) Photo by Steve Bentsen.