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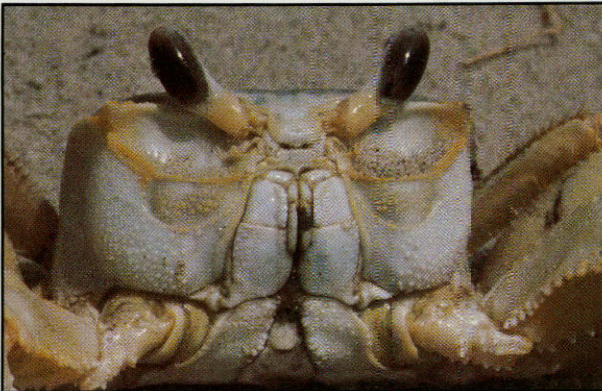
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Front Cover: Moths are masters at camouflage. The polyphemus moth, *Antheraea polyphemus*, has large eyespots on each wing that help protect it, and like other moths its coloring and texture help it blend into the background. Moths sit for hours in the same position during the day, making them easy to photograph. (See story on page 16). Photo by Paul M. Montgomery.

Inside Front: Jackrabbits become active at twilight and forage well into the night. Photo by Glen Mills.



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Spring Squirrel Hunters Have the Woods to Themselves

by Ray Sasser

A late-season front had dropped about half an inch of cooling rain on the hardwood bottoms flanking the Neches River in deep East Texas. The front had moved on through, leaving the predawn sky washed clean and the stars winking like finely cut diamonds held just so before a strong light.

The woods were damp and deliciously cool. I slipped in noiselessly and took a front row seat on a hollow log, shivering just a little as my pants soaked up the chilled rainwater with spongelike efficiency.

Nature's stage lights came up ever so slowly and the cast of characters began to appear. An armadillo shuffled by, an interesting, though dull-witted holdover from a different time, a survivor whose nine-banded armor once protected it from hairy carnivores, but now proves totally ineffective in shielding it against speeding automobiles.

Birds began their daily stirrings. The scratch of claws on bark followed by a staccato "rat-tat-tat" signalled that a pileated woodpecker was busily jackhammering his breakfast from a nearby pine snag.

The secret to a successful squirrel hunt is to get into shooting range without alarming the animal. Find a likely stand of woods and sit or stand as still as possible listening for squirrel sounds such as the rustle of leaves or scratch of claws on bark. If you have to stalk a squirrel, do so as quietly as possible.

Another scratching sound of claws on bark warranted closer attention. The sound was followed by the "whoosh" of a leafy limb bending under a significant weight, then springing back as the weight was transferred. The limb showered water droplets as I turned my head slowly and spotted the springtime drama's lead player, a gray squirrel, silhouetted against the rising sun.

Slowly the squirrel began working in my direction. He was a bundle of paranoid nerves—understandable for a mammal so low on the food chain. I let him come and, five minutes later, slowly shouldered the 12-gauge and brought the squirrel to earth.

The early May morning soon warmed enough to spawn a horde of mosquitoes and make me thankful for the modern miracle of bug dope. By then my game sack was bulky with the heft of three gray squirrels, called cat squirrels in this neck of the woods, and an oversized fox squirrel I'd caught napping on a bare pine limb.

I walked now at a fast hiker's pace, the spring woods a verdant canopy of new life. I'd just reached the boggy dirt road and started for the firmer ground where I'd left my vehicle when a venerable pickup came churning through, slinging mud and fortunately not capable of sliding out of the deep ruts.

The driver was an old gentleman wearing overalls and a soiled felt

hat. He slid the pickup to a skittering halt just a few feet away and appraisingly eyed my shotgun, game vest and camo clothing.

Then the old man spat messily and I saw that not all the brown coloration on the side of his truck was mud.

"I got a good mind to turn you in," he said, the words delivered with a certain degree of venom.

"Really?" I said, trying to sound surprised but realizing what the old man thought. "What for?"

"Why you know good and well what for. Huntin' squirrels out of season, that's what for."

"Well, sir, I appreciate your concern for the law, but there's a spring squirrel season running the entire month of May in most East Texas counties."

The old-timer mulled over what I'd said. His brow was wrinkled into a wondrous network of folds slowly eroded by a long life out of doors. He was trying to figure out if I might be telling the truth. Finally, he must have decided that I was too flagrant or too stupid to be a poacher, walking around like that on a public road. He spat on the old truck again, clanged it into low gear and went spinning and sliding away.

"Spring squirrel season," I heard him say. "What'll they think up next?"

Well, "they" actually thought up the idea a long time ago. Most northeast Texas counties have had a spring

season on squirrels for over 20 years. In 1979, the Texas Parks and Wildlife Department opened spring squirrel seasons during the month of May in all southeast Texas counties under its regulatory control.

There are apparently a lot of folks out there like the old-timer I encountered who've never heard of spring squirrel hunting. The sport isn't exactly setting the woods on fire, although Gary Spencer, a Texas Parks and Wildlife Department upland game biologist in Jasper, thinks the lack of popularity has more to do with tradition than anything else.

"We're gaining a few spring hunters every year but the sportsmen are just not used to hunting this time of year," explains Spencer. "Traditionally, spring is the time to go fishing and plant gardens. Sportsmen get excited about hunting in the fall."

Some hunters still cling to the mistaken belief that spring hunting will result in less game for the more popular fall season. Spencer says that's not so.

"Squirrels in East Texas produce two litters of young in most years," he explains. "The spring season coincides with the weaning of the early spring litter. Many of those squirrels born in the spring will be sexually mature in time to contribute to the fall crop."

"Hunters kill only about 15 percent of the East Texas squirrels. Since the annual mortality rate may run as high as 50 percent, hunters have no impact on overall squirrel numbers, even with the spring season."

What the two-litter reproductive cycle means is that the squirrel population peaks in October when fall hunting begins. In the spring there are only about half as many squirrels available to hunters.

But this doesn't mean spring hunters can expect conditions to be twice as difficult as those found by fall hunters. In some public area squirrel hunts monitored by Texas Parks and Wildlife, spring success was just as high as during fall hunts on the same areas.

Lack of hunting pressure in May certainly has a lot to do with spring hunting success. Squirrels that are

hunted hard become extremely wary and difficult targets for all but the most accomplished woodsmen.

For many sportsmen, the primary appeal of spring squirrel hunting is that they're likely to have the woods all to themselves. For instance, the hunt I described at the beginning of this story took place in a popular stand of woods owned by a timber company and open to all hunters during legal seasons.

In October, those same woods may contain almost as many hunters as squirrels. On that spring hunt, I never saw another hunter, nor heard a shot other than my own.

With the steady decline of good East Texas squirrel habitat that's open to the public, a hunt without competition is a premium experience. Except for the lack of hunters, hunting East Texas bushytails in May is very much like hunting them in early October.

Weather is likely to be about the same. Most years there will be some hot days and some pleasantly cool days. The hardwoods are loaded with leaves, except now all leaves are green instead of the traditional colorful fall kaleidoscope.

Keep a sharp eye out for poisonous snakes, which are also present in October, and don't venture into the woods without an ample supply of insect repellent. Repellent-soaked pants cuffs will ward off most ticks and chiggers.

The Pineywoods belt is home to two different squirrel species. There's the popular gray, or cat squirrel, and the much larger, more sedate fox squirrel. Both offer their own brand of challenge, with personalities largely dictated by their preferred habitat.

You'll find cat squirrels in the bottoms, along creek and river drainages. They prefer dense understory. Good cat squirrel habitat can be a nightmare of tangled second-growth hardwood and vines. With an abundance of escape routes and a balancing ability that would shame a highwire artist, cat squirrels most often run from danger. The resulting shots, with squirrels leaping from limb to limb, branches and leaves

running interference, are extremely sporting.

The fox squirrel is not only different in color and size, he's also as different in personality from his cat squirrel cousin as Tom Landry is different in football philosophy from Bum Phillips. Fox squirrels prefer upland habitat, though fox and cat squirrel populations often overlap. The classic fox squirrel woods resemble a park, with large, mature trees shading the forest floor and preventing underbrush from flourishing.

With fewer avenues of escape and less maneuverability than the smaller cat squirrel, a fox squirrel that detects danger often will try to hide rather than run. And, if you think a fox squirrel is a master of disguise in a frost-bared beech tree, try searching for him in a springtime hardwood loaded with new leaves.

Best bet for success on both fox and cat squirrels is to get within good shooting range without alarming the game. You can do that by still-hunting, an acquired skill with the most essential element being patience.

Since squirrels do most of their feeding early and late in the day, it's important to be in the woods during peak hours. The most important part of still-hunting is the "still" part. Hunters who move constantly through the woods as if they're on an afternoon stroll don't see much game.

An effective plan is to slip as quietly as possible into a stand of likely woods, then find a comfortable seat. Sit as still as possible, listening for squirrel sounds, such as the rustle of leaves, the whoosh of limbs bending, then springing back, the scratch of claws on bark and the chatter of the more vocal squirrels.

Sit or stand quietly for 15 minutes or so in a likely area. If you don't spot game, move to a new vantage point as silently as possible. Remember that you don't need to move far to command a good view of woods you couldn't see from the previous spot.

Once you see a squirrel, watch for awhile to determine what the animal is doing. If he's feeding your way, just sit still and let him come. If it's



Cat squirrels usually run from danger, and it takes a skillful hunter to bag an animal that's leaping from limb to limb. A squirrel is a bundle of paranoid nerves, but it's also tough and tenacious of life.

obvious that you'll have to stalk close enough for a shot, plan the stalk before you move. Use vegetation to hide your approach, moving very slowly and being careful to make as little noise as possible.

A squirrel stops whatever it's doing periodically and takes a long, hard look around for danger. Cat squirrels look around more often than do fox squirrels. The secret is to move when the squirrel is occupied and freeze when the animal stops to look around.

In the fall, when vegetation is off the trees, some East Texas hunters like to use a trained dog to trail and tree squirrels. Leave the dog at home during spring hunts. The leaves are so thick you probably won't find many of the squirrels your dog trees.

Expert shots often do well with .22 caliber rifles once the leaves have fallen, but spring is not a good time to hunt squirrels with a rifle. The

shotgun is the accepted tool for this sort of work. Almost any shotgun will do the job, although the .410 bore is suspect, since it creates a very ragged pattern that's likely to wound squirrels without killing cleanly.

Squirrels may be small, but they're pretty tough little critters and very tenacious of life. Cripples can escape easily in the thick cover. It's a good idea, then, to shoot high-velocity loads at squirrels. No. 6 or No. 4 shot are good choices.

A squirrel's diet changes from necessity in the spring when acorns, beech nuts and other mast is not available. It will eat mushrooms, insects, buds and berries this time of the year. Squirrels do not change their territory dramatically. Good fall squirrel woods also produce game in the spring.

Mulberries are a particular favorite of spring squirrels. Find a mulberry tree with berries and you're in business. The berries attract bushytails the way a magnet draws steel filings.

Best East Texas action in May comes in the snarled bottomland haunts of the cat squirrel. Cat

squirrels tend to congregate in much higher densities than do fox squirrels. A good spring gray squirrel population may exceed one squirrel per acre. Fox squirrels require more elbow room and a typical spring population may number only one animal per three or four acres.

There are many counties in Texas that have no closed season or bag limit on squirrels, but fall squirrel hunting is not a popular sport in such areas of the state, despite occasional good populations of fox squirrels.

Squirrel hunting and East Texas just seem to go hand in hand. And that's fortunate because East Texas also claims much of the state's open hunting lands.

Gary Spencer recommends trying your luck in Davy Crockett, Angelina and Sabine National Forests. Detailed maps are available by sending \$1 for each map to National Forests of Texas, P.O. Box 969, Lufkin, Texas 75901. Include a self-addressed, stamped envelope.

Major East Texas timber companies also make lands available to public squirrel hunting. For information, try Southland Paper Mills, Inc., P.O. Box 149, Lufkin, Texas 75901; Temple Industries, Diboll, Texas 75941; International Paper Co., P.O. Box 909, Woodville, Texas 75979; Kirby Lumber Co., P.O. Box 1514, Houston, Texas 77001; or Southwestern Timber Co., 229 Bowie St., Jasper, Texas 75951.

As with almost any large tract of woods, only a small area within the many acres produces good squirrel hunting. In the fall, these hotspots draw heavy traffic from other hunters. In May, there's a good chance you'll have them all to yourself.

Be sure to check hunting regulations for the county you intend to hunt. A few counties not under the Parks and Wildlife Department's regulatory authority don't allow spring squirrel hunting. And it might be a good idea to take along a copy of the Texas Hunting Guide, 1982-83, just in case you run into a crusty local who hasn't heard about spring squirrel season and is seriously considering a citizen's arrest on an apparent poacher. **

Hidden Beauty of the



Polyphemus moth, *Antheraea polyphemus*

MOTH

Article and Photos by Paul M. Montgomery

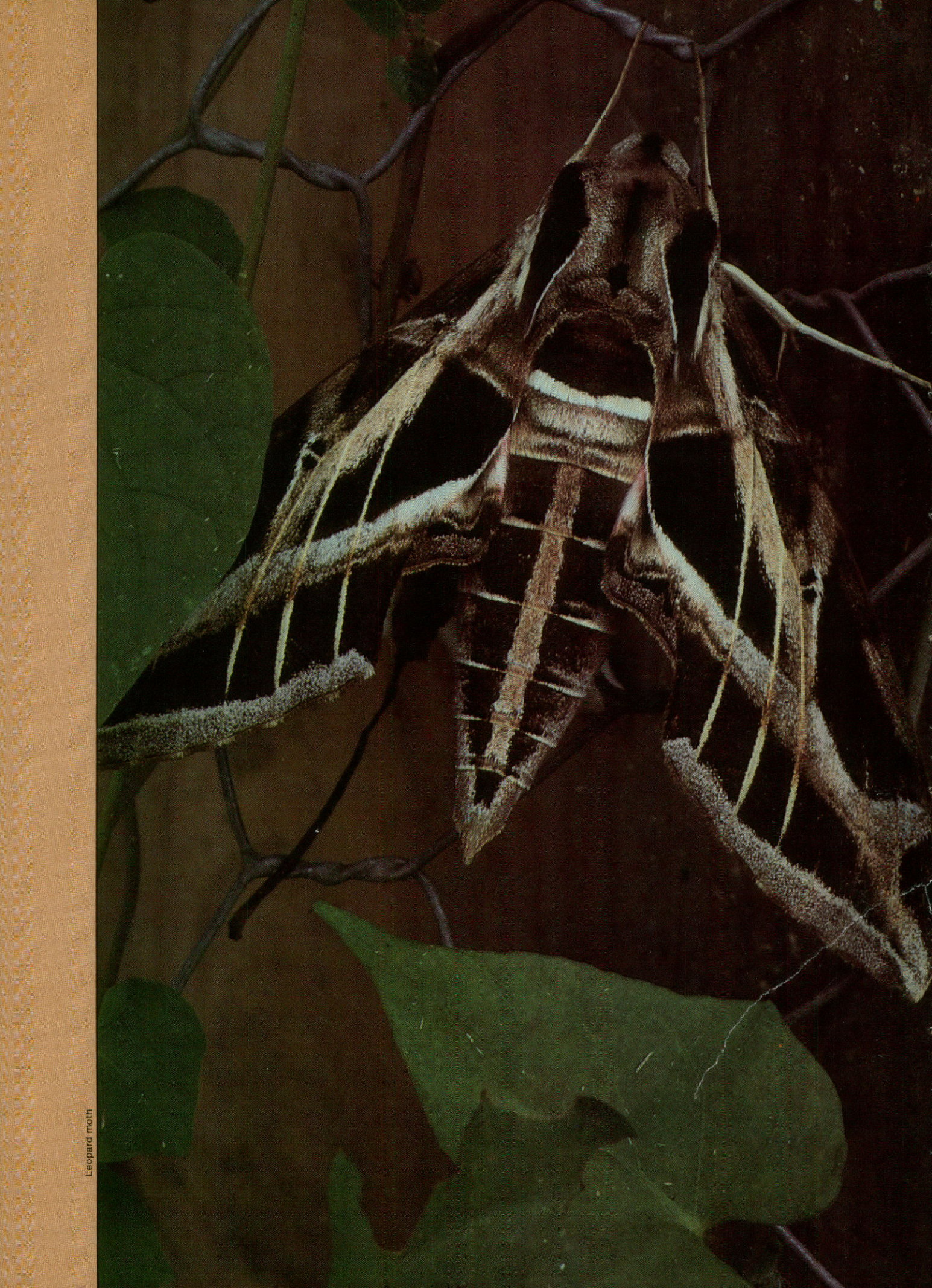
In 1903, W.J. Holland published a popular guide to the moths of North America titled "The Moth Book." In it he describes his method for procuring moths with "four pounds of cheap sugar, a bottle of stale beer and a little rum." By brushing trees with this mixture Dr. Holland was able to attract moths for capture and identification.

Although I have never tried his recipe to attract moths, I have been amazed to find so many hiding themselves on the branches and trunks of trees in my backyard. My first encounter with this defensive aspect of their lives came while photographing a tree roach late last summer. At first I could not believe the thoroughness with which the moth blended into the texture and coloring of the tree limb. It was almost invisible! As my awareness of this protective device grew, I came to marvel at the incredibly subtle beauty of moth and tree bark blending together in a way only nature could intend.

Moths will sit for hours in the same position during the day. At this time they easily are photographed, but they are capable of explosive flight when disturbed. The hind wings of most moths are hidden during the day, concealing the incredible varieties of red, orange, blue and green shades that often mark the hind wing. With the exception of the polyphemus, grey underwing and white-lined sphinx, the fore wing is usually all that can be seen, but the hind wings become evident if the moth is disturbed or if it recently has landed on the tree trunk.

The sugar, beer and rum mixture might work if one were intent upon capturing these creatures. However, for me at least, the greater aesthetic challenge is to see them as they hide, capture them on film as they rest and leave them at their peace. **





Leopard moth

Cagger moth, *Apatela* sp.



Ermine moth



Grey underwing moth, *Catocala illa*



Luna moth, *Actias luna*

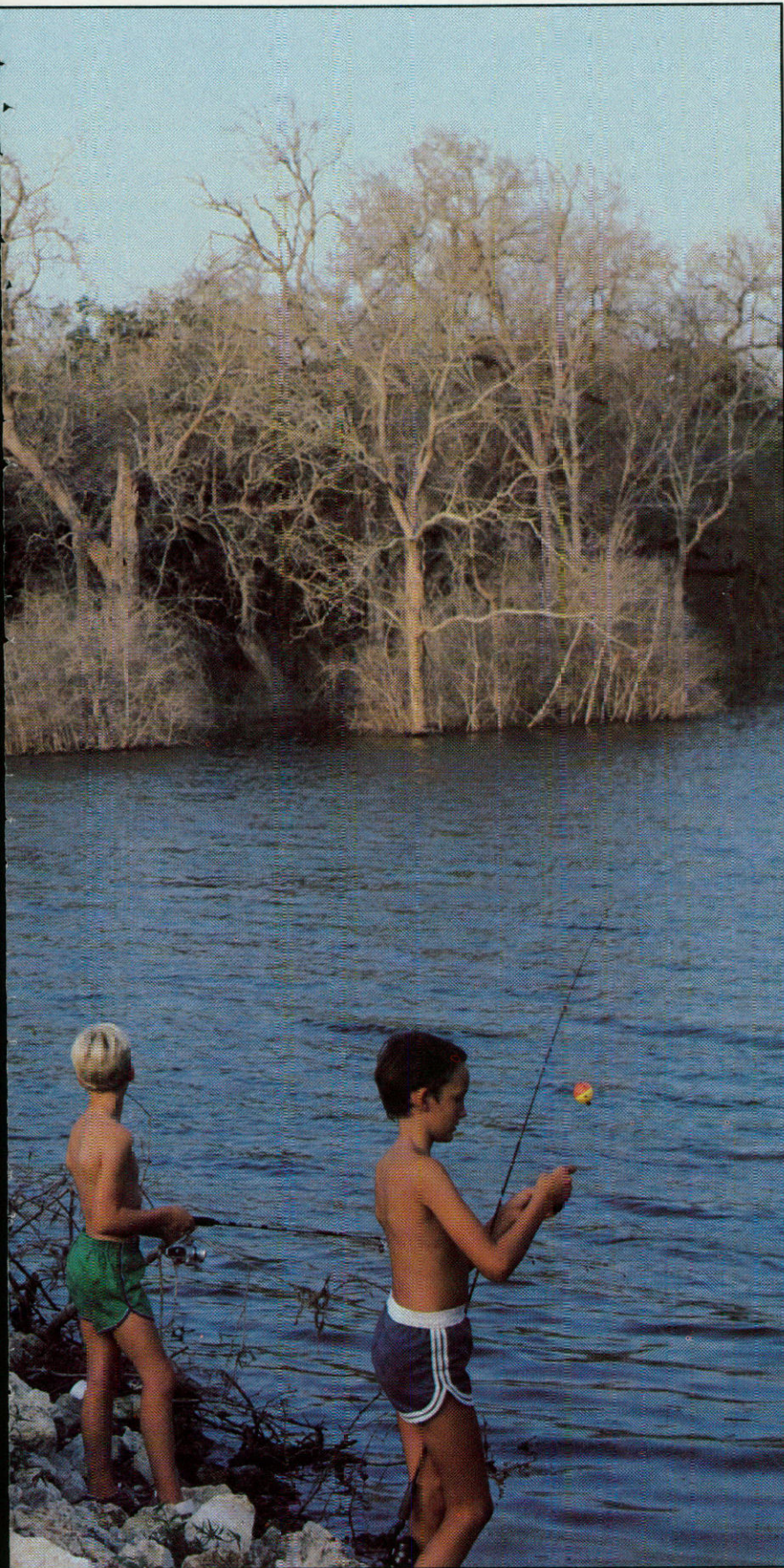


Virginia creeper sphinx moth



Salow moth, *Glaea* sp.





The Attractions of Man-Made Structures:

Part I- Docks, Piers and Others

by Jim Cox

The lakeside resident was settled comfortably in his lounge chair, soaking up the sun's rays and perusing the morning paper. Out on the lake, a troll motor-powered boat silently approached, pulling to within casting range of the man's covered boat dock.

The lounge's attention was wrested from the sports page by a considerable splashing and animated conversation. To his surprise, he saw an angler lower-lipping a healthy largemouth bass hooked from beneath an empty boat slip.

The landowner and his fellow lakeside dwellers probably never thought they were contributing to fishermen's success when they built their boat docks, piers or other shoreline facilities. But to largemouth bass in some lakes, these artificial contraptions are about the only shelter in an otherwise barren aquatic environment.

The past decade or so has ushered in a new breed of bass fishermen who worship at the shrine of "structure." They have learned that

Heavy rocks used to construct jetties, such as these at Lake Texana State Park, offer dwelling places for crawfish and cover for small organisms, increasing fish concentrations. The trick is to get a lure near the rocks without snagging.

largemouths spend at least a portion of their lives snuggled up to objects, not unlike a cottontail rabbit in a briar patch. The reasons for this behavior among fishes is not totally clear, although in the case of largemouth bass it probably is related to its evolution as a river fish. Although the majority of Texas bass live in and are caught from lakes instead of rivers, the wily largemouth still seeks a riverine type of environment featuring plenty of hiding places such as stumps, cutbanks and weed beds.

Many Texas bass lakes are well endowed with such structure, but most are not. Even lakes that possess a fair amount of brush, trees and other vegetation when impounded often fail to sustain a long-lasting bass fishery because the deterioration process eventually eliminates the woody cover while siltation flattens out the lake's bottom topography.

This lack of cover does not automatically preclude good bass produc-

Fish use the pilings under piers for shade and cover, and bridges form an obstacle for floating brush and debris that can collect on the upstream side.

tion in a lake, since other factors such as water quality, forage fish and the like also enter in. However, it does present problems for the angler, who may have to search more water to find structure harboring bass.

The answer to the problem often is fishing around man-made structures. These can be divided into two categories—those built for man's pleasure or commerce, including boat docks, boat ramps, bridges, levees and power plant structures; and fish attractor reefs deliberately constructed and sunk into lakes to concentrate game fish. This month we'll talk about the first group of structures. Here are some often-overlooked hideouts that produce bass, crappie, sunfish and other species.

Boat Ramps—A veteran Lake Travis fisherman enjoys telling the story about a predawn experience with his notoriously slow fishing partner who always took too much time to launch his boat. Weary of waiting, he tossed a lure near the edge of the ramp and caught a two-pound largemouth, which he brought up the ramp and tossed into the lap of his surprised partner as he was

backing the boat toward the water. Paved boat ramps get lots of boat traffic but little fishing pressure, as fishing parties crank up and roar off to distant hotspots.

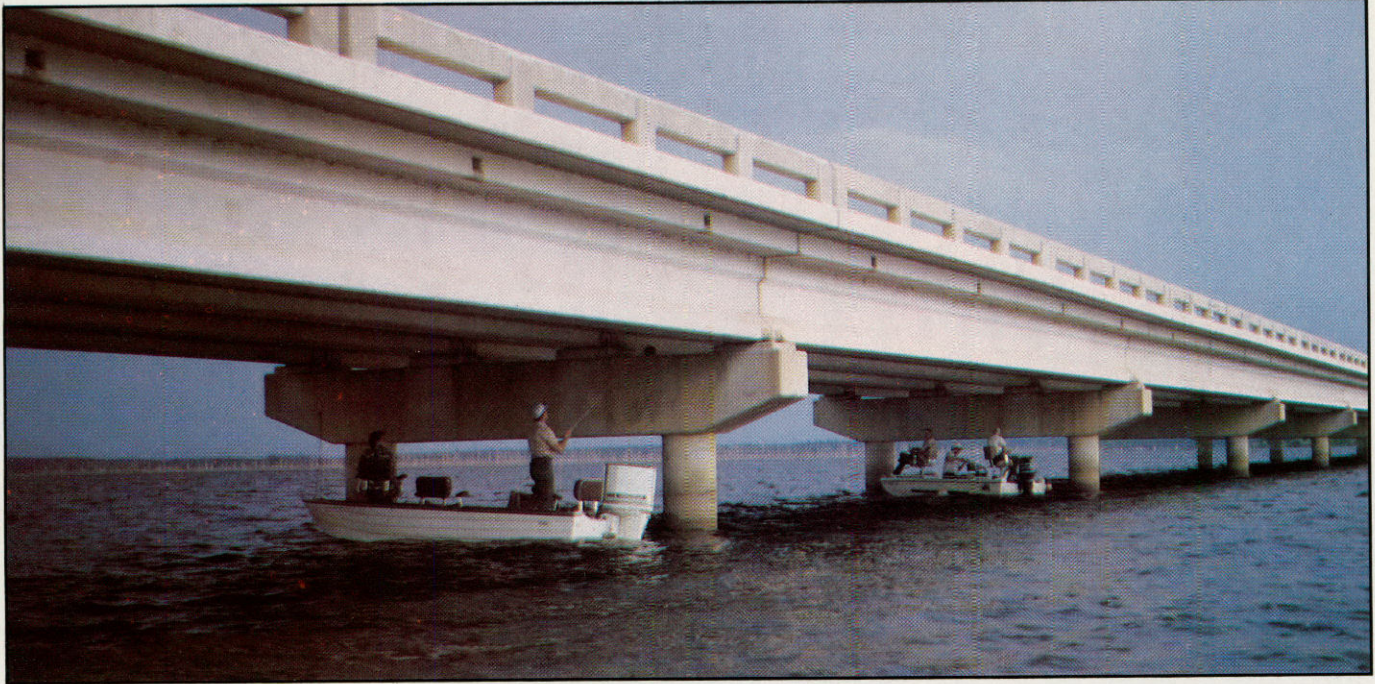
Ramps and the rock materials generally used to shore up their sides provide surprisingly good habitat for both largemouth and smallmouth bass. Minnows use the sloping concrete for shallow foraging area, and bass probably lie below along the rip-rap watching for the unwary. Crawfish and other aquatic life no doubt hide in the rip-rap, contributing to the food chain. Most ramps also end rather abruptly, forming a steep dropoff ranging from several inches to more than a foot. A plastic worm or jig worked along the edges or off the end of a boat ramp sometimes pays off. One angler who pursues smallmouth bass at Canyon Reservoir always starts fishing exactly where he launches his boat, and then takes a tour of all available ramps before trying any other pattern.

Boat Docks—Unfortunately, most owners of boat docks and piers don't realize the potential these structures have for holding fish. Those who do sometimes drop weighted brushpiles under the docks. The shade provided by the dock and cover from the sunken brush or trees is a sure-fire combination for attracting fish. Even in the absence of brushpiles, fish often move under boat docks, using the pilings, walkways and tethered boats for shade and cover. Shade acts as a magnet for bass at times, probably offering a feeling of security. Bright sunlight, contrary to certain folklore, does not hurt a bass' eyes. Underwater observations have found the fish suspended just under the surface on bright, calm days. However, when given the choice, largemouths apparently favor shady areas much of the time.

Boat docks can be fished in a variety of ways, but boat positioning and casting ability often are just as important as lure selection. A crankbait tossed into the far corner of a boat stall and retrieved as close as possible to underwater pilings often gets strikes, but the angler also must watch out for submerged cables used

Glen Mills





to moor the docks. Plastic worms and weedguard-equipped jigs are excellent lures in tight quarters where hangups are likely. Open-faced spinning reels and whippy rods are superior for fishing around docks and piers, since tricky underhand throws often are needed to get the lure up under these structures. If the water is neither too clear nor too shallow, artificials or live bait can be fished straight down, or "doodle-socked" close to dock pilings with good results. In public lakes, the water beneath docks may be fished by anyone, but boarding a dock to retrieve a snagged lure could be considered trespassing, so care is recommended.

Bridges—Bridges per se do not necessarily provide good structure, but they form an obstacle for floating brush and other debris that can collect on the upstream side. Anglers should fish the upstream of pilings, whether debris is visible or not. Also the downstream side often provides eddy areas where shad and minnows congregate. Bridges also provide an aquatic foothold for moss and other vegetation that can attract fish.

Rock Jetties—Jetties and breakwaters often are constructed by river authorities or power companies for protection of areas subject to wave erosion or other damage. The heavy rocks or cement blocks normally

used to construct them offer a dwelling place for crawfish and cover for other small organisms. The trick in fishing these areas often is getting a lure or bait near the rocks without snagging. The ends of jetties are potentially good places for large-mouth bass, providing a point where varying water depths and currents sometimes harbor forage. The rocks usually extend underwater for some distance from the end of the jetty, so it might pay to fish a considerable distance from the point. Even jetties constructed of materials other than rock can be productive. For instance, crappie fishermen have a field day fishing along a Lake Somerville breakwater constructed of automobile tires stacked into concrete foundations.

Fencerows—Often when a reservoir is impounded, neither landowners nor lake authorities bother to remove old barbed-wire fences from the future lake bed. Any section of fence, even a deteriorated one, should never be passed up by fishermen. Many a bass tournament has been won by contestants who worked fencerows, particularly on lakes that are lacking in natural cover. The wires and posts of a fencerow act as a stationary net, collecting all manner of debris. This has the dual effect of pulling in bait fish that feed on the food chain

created by rotting materials, and adding to the structure provided for bass and other fish that relate to it. When fishing a fencerow, a spinner, crankbait or topwater retrieved parallel to the fence is the best percentage cast. After casting around the visible sections of the fence, move the boat back and work the deeper sections with a plastic worm or weighted jig. Live bait also would be effective, particularly in the deeper areas.

Water Intake Towers—Those funny-looking concrete buildings that rise from the water just in front of dams are used for drawing water from the reservoir and funneling it through the dam to the tailrace area below the dam. These skinny high-rise buildings might not appear to be something fish would like, but in some lakes they are a consistent producer. Algae and moss clinging to the sides of the towers give bait fish a grazing area, and their presence is a magnet to predator fish. Crappie in particular seem to congregate around them. The main trick to fishing such structures is figuring a way to tie the boat to the structure, since most are situated in water too deep for anchoring. Also, placing the bait or lure at the right depth is important for suspended fish. A depth finder is helpful here. **

Next month: Fishing Artificial Reefs

19th Century Forts now 20th Century Parks

by Mary-Love Bigony

Indian raids, massacres and scalplings have created many a riveting scene in Western movies, but in 19th century Texas, such occurrences were possibilities of everyday life. Living one day to the next was difficult enough for the sturdy people who settled on the Texas frontier without the ever-present threat of marauding Indians. Comanches and Kiowas were the most hostile, and confronted settlers as well as other tribes.

Settlers and travelers through Northwest Texas understandably demanded that the government provide military protection, and Indian problems did in fact abate in the late 1850s after the United States established forts. But U.S. military control ceased when Texas seceded from the Union and joined the Confederacy, and Indian attacks resumed. When the Civil War ended in 1865, the Reconstruction Government undertook protection of the frontier settlements with a chain of six forts from Jacksboro to Eagle Pass. By 1875, most of the Indian problems in West and Northwest Texas were over.

Six 19th century forts now are part of the Texas State Park System. Four of these were military forts, one was a fortified trading post and one was built by a group of settlers from Illinois. Archaeological, architectural and historical research at all six sites has yielded information about a turbulent period of Texas' past, and visitors to these historic ruins and reconstructed buildings can perceive the essence of frontier Texas.



Leroy Williamson

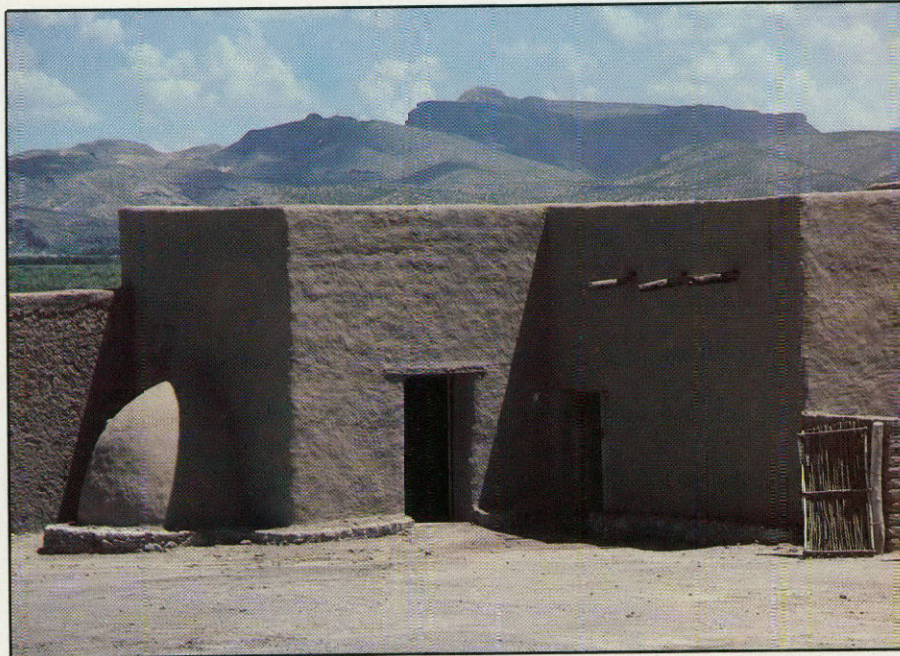
Indians captured Cynthia Ann Parker in 1836 at a fort very much like the reconstructed Fort Parker (above). More than 500 miles west of Fort Parker, Fort Leaton stands in a remote spot on the Rio Grande (right). Guided tours of the restored building are available.

FORT PARKER

Oldest of the six is Fort Parker, built in 1834 by several Illinois families who chose a tree-covered spot on the Navasota River for their homestead. Recognizing the possibility of attack by Indians and Mexican bandits, the settlers patterned Fort Parker after forts used in the eastern United States during the 18th century.

Fort Parker had been in existence two years and the battle of San Jacinto had just ended the Texas Revolution when on May 19, 1836, an event brought tragedy to the Parker family and sealed Fort Parker's place in Texas history. Indian hostilities apparently had diminished and the settlers relaxed the extreme caution that had once governed their lives. On that spring morning, a band of several hundred Indians rode quietly up to the fort. They stopped without entering and raised a white flag. Benjamin Parker approached the Indians, who told him they wanted meat and directions to the nearest water. Although the request was suspicious since the Indians had just emerged from the Navasota River bottom, Benjamin Parker returned to them with the meat, hoping to avoid an attack. Then the terror began. The Indians killed Benjamin with their lances and stormed the fort. They killed Silas Parker, Samuel Parker and his son Robert. By the time the chaos ended, five of the settlers were dead, three were critically wounded and five had been taken prisoner.

Among those captured were nine-year-old Cynthia Ann and six-year-old John, Silas Parker's children. Long after the other captives had been ransomed the fates of Cynthia Ann and John remained a mystery. Cynthia Ann was recaptured 24 years later by Captain Sul Ross and his Texas Rangers. During those years she had married a Comanche chieftain, Peta Nocona, and reared her three children as Comanches. She was returned to her family in East Texas, but tried several times to escape and died four years later, never readapting to the white man's life. She was buried in East Texas, but her son Quanah, who later be-



came the last great Comanche chieftain, had his mother's remains moved to Oklahoma.

Today at Old Fort Parker State Historic Site, visitors may see a reconstruction of the original Fort Parker, complete with blockhouses, gates, walls, homes and stores. Just five miles away, Fort Parker State Recreation Area offers camping, swimming, fishing and hiking.

FORT LEATON

Fort Leaton, a fortified trading post, was built in 1848 by a mysterious man named Ben Leaton, who came to this remote spot near Presidio on the Rio Grande at the end of the Mexican War. Prior to settling in this isolated country, Leaton worked for the Mexican governments of Sonora and Chihuahua collecting Indian scalps.

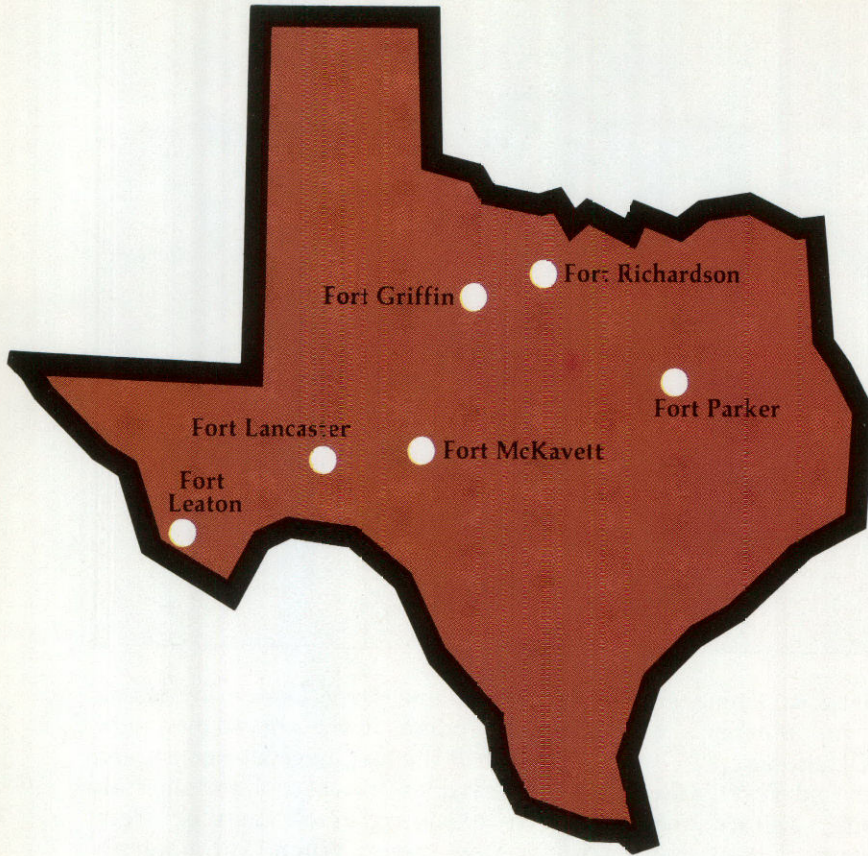
Leaton's massive adobe fortress covered almost an acre and was comprised of some 40 rooms and a large corral. It is one of the largest adobe structures ever built in Texas. Leaton farmed the land around the fort and monopolized the Indian trade by swapping weapons and ammunition for livestock the Indians had stolen. Both the American and Mexican governments condemned Leaton for encouraging Indian raids on Mexican settlements.

Countless legends surround Ben Leaton and the fort he built. Accord-

ing to one story, Leaton invited all the Indians in the area to dine with him at the fort. Everyone consumed great quantities of food and sotol, an intoxicating drink distilled from native cactus. When Leaton awoke the next morning he found his guests had stolen all his horses and mules. According to the legend, Leaton invited the same group for another dinner, where they once again ate and drank with abandon. But this time Leaton had concealed a cannon behind a screen, and at the height of the party fired round after round at the trapped Indians, killing them all.

Leaton died in 1851. His widow, Juana, married Edward Hall, who operated a freighting business out of the fort. Hall borrowed money from John Burgess, a Mexican War veteran who had come to the area with Ben Leaton, and used the fort as collateral. Burgess foreclosed on the fort when Hall failed to pay the debt, but Hall refused to leave and was soon murdered. The fort then passed into the hands of the Burgess family, and John Burgess established a successful freighting business on the San Antonio-Chihuahua Trail.

Visitors to the restored Fort Leaton may take a guided tour of the huge adobe structure and see a replica of the giant Chihuahua cart used on the San Antonio-Chihuahua Trail. Exhibits trace the history of the region from the 15th century.



For further information, contact the forts at the following addresses and telephone numbers.

**Old Fort Parker
State Historic Site**
Route 3, Box 220
Groesbeck, Texas 76642
817-729-5253

**Fort Lancaster
State Historic Site**
P.O. Box 306
Sheffield, Texas 79781
915-762-3592

***Fort Parker
State Recreation Area**
Route 3, Box 95
Mexia, Texas 76667
817-562-5751

***Fort Richardson
State Historical Park**
P.O. Box 4
Jacksboro, Texas 76056
817-567-3506

**Fort Leaton
State Historic Site**
P.O. Box 1220
Presidio, Texas 79845
915-229-3613

***Fort Griffin
State Historical Park**
Route 1
Albany, Texas 76430
915-762-3592

**Fort McKavett
State Historic Site**
P.O. Box 867
Fort McKavett, Texas 76841
915-396-2358

**Camping available*

FORT MCKAVETT

Originally called Camp on the San Saba, this fort was established in 1852 on a hill overlooking the south bank of the San Saba River. It was renamed Fort McKavett within the year in honor of Captain Henry

McKavett, a Mexican War hero. The fort's location atop a hill protected it somewhat from the Comanches who roamed the area. Fort McKavett's residents enjoyed ample water, good fishing and hunting, a library, church services, bands and dances. This

relatively comfortable life lasted seven years, until the fort was ordered abandoned in 1859.

Following the Civil War, Indian raids had reached a point that settlers in the area pleaded for military protection. Fort McKavett, its buildings in ruins, was reestablished in 1868. The following year saw the arrival of Colonel Ranald S. Mackenzie, the renowned Indian fighter. Mackenzie and his troops engaged in four Indian scouting expeditions that year, following the colonel's philosophy of tracking the Indians to their own haunts and destroying their supplies, making it impossible for them to renew their raids. The soldiers also repaired the buildings that had deteriorated in nine years of disuse, and once again Fort McKavett was a model of design.

Indian problems began to subside and civilization came to the frontier. Fort McKavett was ordered abandoned on June 30, 1883. Today Fort McKavett consists of historic ruins, many of which have been restored. Exhibits in the interpretive center describe the fort's colorful history.



Glen Mills

FORT LANCASTER

The men at Fort Lancaster on the Pecos River had an enormous responsibility: to control the Indians of the region and protect the settlers, gold miners, freighters and mail wagons heading west. Lancaster was established in 1855, one of four posts created by the federal government during the 1850s. An early U.S. Army explorer had suggested a line of forts "where the Indians live instead of where the citizens live," and that's where Fort Lancaster was located. It was near Live Oak Crossing on the Pecos River, which most travelers on the San Antonio to El Paso road used. Scouting parties traveled out from Lancaster often, but as troop numbers were small and distances great, Indian raids continued.

Life was hard at Fort Lancaster. Many of the men were new recruits who were poorly instructed in Indian warfare. Uniforms, rifles and ammunition were always in short supply. Hardware was obtained from San Antonio and finished lumber had to be hauled in from Fort Davis, so for a long time the men were housed in tents, picket houses with canvas roofs or portable barracks. Most of these temporary structures eventually were replaced by limestone and adobe buildings and by 1860, Fort Lancaster consisted of a group of buildings around a central parade ground with soldiers' barracks on the west, officers' quarters on the east and a row of outlying structures.

Texas seceded from the Union on January 28, 1861, and General David E. Twiggs, commander of the Department of Texas, ordered abandonment of all United States forts and the surrender of all personnel. On March 19, 1861, the troops at Lancaster and two other western posts marched to San Antonio to surrender.

During the Civil War, the Confederate Texas government designated Lancaster as a second line of defense. The Second Regiment of Texas Mounted Riflemen occupied Lancaster for a short time, and for several months in 1861 and 1862 the W.P. Lane Rangers were stationed



Ghostly ruins at Fort Lancaster (above) and Fort McKavett (left) are stark reminders of life on the Texas frontier. Soldiers stationed at these isolated West Texas posts more than a century ago found many of their days filled with tedium and hardships.

there. After the Civil War, U.S. troops used the Fort Lancaster site as a subpost in the fall of 1867 and briefly during 1868 and 1871.

Ghostly ruins are all that remain

today of the once-thriving military post. Visitors to Fort Lancaster can trace its history through exhibits complete with illustrations and artifacts.

FORT RICHARDSON

At the end of the Civil War, the federal government again was faced with protecting settlements in the western part of Texas from frequent and brutal Indian attacks. In the chain of six forts established, the northernmost was Fort Richardson. Established at Jacksboro in 1867, it was just 70 miles from Indian Territory, which later became part of Oklahoma. It was named for General Israel B. Richardson, who died in the Battle of Antietam during the Civil War.

Fort Richardson's troops frequent-

ly pursued tribes that were known to have raided settlements, as well as making weekly patrols in response to complaints from settlers and travelers. During one of these patrols, in July 1870, a war party of 250 Kiowas attacked Captain Curwin B. McLellan and a detachment of 56 men. The Indians almost completely surrounded the soldiers, who stood their ground and then retreated under heavy fire to a defensive position near the Wichita River. After putting the Army in a defensive position, the Indians pulled away.

The Salt Creek Massacre in May 1871 resulted in Indians being tried in civilian court for the first time. A large group of Kiowas and Comanches attacked a wagon train 22 miles west of Fort Richardson. They killed, scalped and mutilated the wagon master and six teamsters, but wounded survivors escaped to Fort Richardson. General William Tecumseh Sherman was at Richardson at the time and heard the story of the attack. Sherman had traveled the same route the day before, and later learned that the only reason he had not been attacked was that the Indians had been restrained by a medicine man who told them the next party to pass would be more easily captured.

Shaken by his narrow escape, Sherman ordered Colonel Ranald Mackenzie, then in command at Fort Richardson, to make an all-out pursuit of the Indians responsible for the attack. The leaders, identified as Santanta, Satank and Big Tree, were apprehended. On the return trip to Jacksboro for trial, Satank was killed while trying to escape. Santanta and Big Tree were tried for murder and sentenced to death. Governor Edmund J. Davis commuted their sentences to life in prison, and granted them parole in 1873 in an effort to appease the Indians and gain their friendship. Both broke their parole by leading raids into Texas. Santanta was returned to Huntsville in 1874 and died when he jumped or fell from a hospital window. Big Tree was arrested, but released at the request of federal officials. He kept his parole this time, and died in 1929 in Oklahoma.

By 1875, Indian troubles were over for the most part. Orders for the abandonment of Fort Richardson were issued in 1878 and the last troops marched to their new station at Fort Griffin.

Some of Fort Richardson's century-old buildings have been restored, and interpretive exhibits in a reconstructed officers' quarters give a picture of life during that time. The 383-acre park has 23 campsites, 40 picnic sites, a nature trail and a small lake.





Members of a reenactment society offer glimpses into life at frontier Fort Richardson (left). The hospital (top left) is one of several buildings that have been restored. At Fort Griffin (above) an interpretive center explains the significance of these historic ruins.

FORT GRIFFIN

Fort Griffin, established in 1867 on the Clear Fork of the Brazos River, was the second link in the chain of forts created after the Civil War. As at Fort Richardson, 50 miles to the northeast, soldiers rode out on patrol regularly and escorted

travelers through the area. But most patrols were unsuccessful, turning up no trace of Indians.

Fort Griffin's original buildings were built with green lumber, which warped and shrank badly. And although there were plans to replace all the wooden buildings with stone

structures, only the commissary, bakery, hospital, powder magazine and commanding officers' quarters were ever built of stone.

When Santanta and Big Tree were paroled in 1873, Indian raids increased dramatically. Whereas 16 people were killed by Kiowas and Comanches in 1873, 65 were killed in 1874. The Army declared that all Indians not on the reservation should be considered hostile and liable to attack. Mackenzie was ordered to track down hostile Indians and take them to the reservation, and Fort Griffin was designated as his supply post. Wagon trains from Fort Griffin delivered supplies to the scattered troops.

Meanwhile, the town of Fort Griffin began to develop with a general store and saloons to occupy the soldiers. Buffalo hunters and cattle drives contributed to the town's growth. The Mooar brothers of Kansas established buffalo hide camps near Fort Griffin, furnishing supplies and marketing buffalo hides. The Great Western Trail (also called the Dodge City Trail) passed several miles west of the town, and cattle drivers bought supplies and probably a drink or two there. Between 1875 and 1880 Fort Griffin's population reached 1,000.

As Indian problems subsided, activities at the fort became routine with only an occasional drill or inspection. By 1877 only one company of soldiers was stationed there, and on May 31, 1881, the flag was lowered for the last time.

A living reminder of 19th century Texas can be seen at the park today in the longhorn cattle grazing there. They are part of the official State of Texas longhorn herd, as designated by the Texas Legislature. There are some 100 cattle in the Parks and Wildlife Department's longhorn herd, which is based at Fort Griffin. A few campsites are available, as well as an interpretive center and historic ruins, some of which have been reconstructed. Standing amid the crumbling walls of this and the other historic forts, the boom of cannons and the rattle of swords are almost audible. **

INFECTED TICKS DISCOVERED AT BASTROP STATE PARK

Ticks infected with Rocky Mountain spotted fever have been found at Bastrop State Park and are more than likely at other locations in Texas, according to Texas Department of Health officials.

Texas Parks and Wildlife Department officials advise prospective park visitors to take precautions against ticks.

Posters have been placed in the park and information is being distributed describing preventive measures and symptoms of the disease.

The Health Department suggested the following precautions regarding ticks:

—Anytime you are in an area where there are ticks, check clothing frequently for ticks. Bathing and a thorough inspection of the entire body is necessary after leaving the area. Particular attention should be paid to the head and scalp. The longer a tick remains attached to the skin the greater the chance of infection. An infected tick usually has to be attached for at least four hours for disease to result.

—Keep your animals free of ticks. They can be controlled with certain insecticide powders, but checking with a veterinarian is advised if ticks appear to be a problem.

—Keep your home and premises free of ticks. For home interiors, consult a professional exterminator. Spray outside premises with a suitable insecticide according to label directions.

VANISHING BUCK DEER SUBJECTS OF STUDY

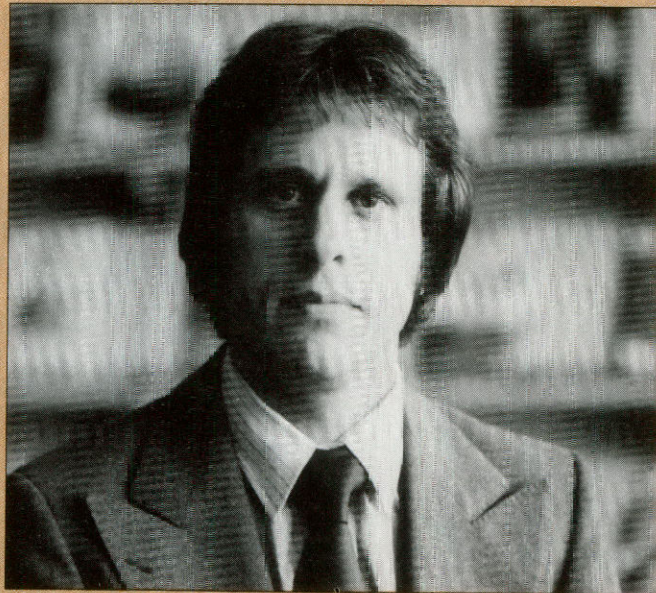
Biologists are trying to crack the case of the vanishing bucks in Matagorda County.

The disappearing bucks are not greenback dollars but white-tailed deer. Instead of fingerprints and magnifying glasses, the biologists are using radio transmitters for their detective work.

The transmitters and tracking equipment were purchased

Outdoor Roundup

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DEPARTMENT'S NEWS SERVICE



ED COX JR. VICE-CHAIRMAN OF TPW COMMISSION

Ed Cox Jr. of Athens, appointed to the commission in 1979, has been elected vice-chairman of the Texas Parks and Wildlife Commission and will serve a two-year term in this position.

Cox is involved in a number of business interests. He also is

active in many sportsmen's and conservation organizations. During 1982 he received the International Wildlife Foundation's "Meritorious Contribution Award" both for his work as a commission member and for white-tailed deer management and research at his ranch.

through donations from the Dallas Ecological Foundation and the Houston Safari Club. Both organizations are active in wildlife conservation and have provided financial assistance for several Texas Parks and Wildlife Department programs.

Past studies of the movements of whitetails have shown that female deer usually are stay-at-homes, while yearling bucks tend to disappear from their home grounds shortly after reaching maturity.

Biologist Bob Carroll of La Grange said in a four-year study

involving observations of freeze-branded bucks, researchers were unable to account for more than 90 percent of the bucks by the time the deer reached 3½ years of age. "Home ranges of young bucks are relatively stable until the month prior to their first breeding season at 1½ years of age," Carroll said. "In some instances, bucks did not disappear until their second breeding season, but by the third breeding season only five percent of the branded bucks remained in the herd."

Carroll said the new study

will consist of fitting 20 bucks and 10 does with radio transmitters. Each deer also will be freeze-branded and ear-tagged for positive identification in the field.

Carroll said the telemetry study should reveal whether the young bucks have a high mortality rate or whether they move several miles away and attempt to set up their own territory.

"The fate of these young bucks needs to be determined so this phenomenon can be fitted into our deer management programs," Carroll said.

BUCK HITS RECORD BOOK AFTER 64-YEAR WAIT

A huge white-tailed deer killed in 1919 near Pearsall has finally qualified for entry into the Boone & Crockett record book as having the fifth-best atypical antlers ever taken in the state.

The late C.J. Stolle of Rosanky, Bastrop County, killed the 29-point buck in December 1919 after an arduous journey from Rosanky to Frio County in a 1919 Model T Ford. Upon his return, Stolle had the deer's head mounted.

The mount remained in excellent condition through the years, but until recently it had not been "scored" to determine how the deer compared to other trophy racks. Stolle's grandson, John F. Stolle of Austin, became curious about the rack after his sons purchased a book on trophy deer.

Stolle called the Parks and Wildlife Department for advice on getting the antlers scored, and found a willing volunteer in Horace Gorz, white-tailed deer program leader. Gorz, an official scorer for Boone & Crockett, scored the antlers at 226½ points, placing it 64th in the nation out of 312 entries in the book. The spread was 27 inches and the base diameter five inches.

Another historical note pointing up how times have changed in the hunting lease business: Stolle ventured to the Frio County ranch with instructions on how to pay for hunting rights; he took the ranch operator a bottle of whisky.

FISHING POPULARITY GAINING MOMENTUM

Fishing is more popular than ever in Texas, judging from an analysis of fishing license sales.

Texas Parks and Wildlife Department officials said computer projections of sales anticipated through August 31, 1983, indicate approximately 3.3 mil-

lion persons will have fished during the current fiscal year. Since many anglers fish both fresh and salt water, the total includes 3 million freshwater fishermen and 1.2 million salt-water fishermen.

Revenue from sales of the

various fishing licenses sold by the department is expected to rise from \$1.8 million in fiscal year 1982 to \$2.2 million in 1983, an increase of some 21 percent.

Fisheries Research Analyst Al Green said his predictions are

based on a five-year license sales pattern and percentages from a 1979 mail survey.

Green said the data includes totals of both resident and non-resident fishing licenses and the resident combination hunting and fishing license.

FISHERMEN INTERVIEWS REACH 50,000 MARK

If you were interviewed after a coastal fishing trip by a Texas Parks and Wildlife biologist, you have joined a large and growing fraternity.

During the past five years, TP&WD employees interviewed more than 50,000 boat fishermen as part of a coastal fishery management program.

Data collected from anglers provides information on game fish distribution and numbers, as well as fishing pressure in various bay systems.

The 150 interview days per

bay system per year involved about 14 employees.

Gary Matlock, assistant chief of coastal fisheries, said these numbers did not include a considerable amount of data collected through interviews with pier and bank fishermen.

Matlock said fishing surveys such as this are combined with other sampling techniques, such as net surveys, commercial landings, charter boat surveys and tagging studies, to monitor overall fish populations and their movement.

KING MACKEREL GET TAGGED

The National Marine Fisheries Service (NMFS) has started a king mackerel tagging program in the Gulf of Mexico, and officials are asking the cooperation of fishermen in recovering the tags.

Crews tagged 311 kings off Grand Isle, Louisiana, during January as part of a growth and movement study. Texas Parks and Wildlife Department biologists anticipate that some of the tagged fish will migrate into Texas waters this spring and summer.

The study also is an attempt to assess the effects of a commercial king mackerel fishery

which developed off the Louisiana coast last summer, according to TP&WD assistant coastal fisheries chief Gary Matlock.

The tagged fish are easily identified by a plastic streamer protruding from the abdomen. The tag must be cut from the fish's body cavity.

A \$10 reward will be paid by the NMFS for returned tags. Officials also ask for date and location of the catch.

Tags should be taken or sent to the National Marine Fisheries Service, 3500 Delwood Beach Road, Panama City, Florida 32407, or any Parks and Wildlife Department office.



1982 DEER HARVEST HIGHEST SINCE 1975

The harvest of white-tailed deer during the past hunting season was the highest since 1975.

Hunters took an estimated 337,600 deer in 1982-83, which was the most since 1975 when the harvest was calculated at 348,900.

Texas Parks and Wildlife Department officials said the hunter success ratio of 52 percent was the highest since statewide harvest estimates were started in 1973.

Horace Gore, white-tailed deer program leader for the de-

partment, said high deer populations and environmental conditions caused the bumper harvest. "There were more deer in the field because of good production the last two years," Gore said. "A slim acorn crop and reasonably dry fall caused the deer to move around more than usual.

"I don't know of any state in the nation that could match Texas in terms of percent hunter success, and we know for sure our annual whitetail harvest always is the highest of any state," said Gore.

FEWER DROWNINGS NOTED IN 1982

Drownings and water-related fatalities decreased during 1982, according to water safety officials at the Texas Parks and Wildlife Department.

They documented 531 drownings during the year, compared to 572 in 1981 and 575 in 1980.

Swimming accounted for the most victims, with 164 deaths; falls, 75; fishing, 53; wading, 44; and 36 miscellaneous. A total of 27 persons died in accidents where motor vehicles fell into the water.

There were 181 deaths in lakes; 96 in rivers; 60 in tanks,

ponds and pits; 54 in the gulf and bays; 54 in creeks, bayous, resacas and streams; and 52 in pools.

Approximately 67 percent of the fatalities involved persons under 25 years old. Of these, 73 percent were males and 27 percent were females.

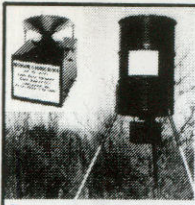
Drinking and/or drugs were involved in the chain of circumstances leading to 116 deaths. Officials said this may not be entirely accurate since some witnesses are reluctant to tell officials that their relative or friend was intoxicated.

June in . . .

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There are about two dozen lakes in Texas which have artificial reefs to attract game fish for anglers. Next month we'll tell you about the lakes and pass on advice from some Texans who have been successful in fishing around the reefs. Looking for a cool place to spend some time this summer? Long-

horn Cavern near Burnet is a constant 54 degrees throughout the year. The popular cave has been attracting visitors for years—from 19th century desperados seeking refuge to revelers who went there to party back in the 1930s. Also in June are stories on offshore fishing for the blacktip shark; hunting on the Parks and Wildlife Department's management areas; the value of Texas' wetlands and the state's (and nation's) most popular game animal, the white-tailed deer.



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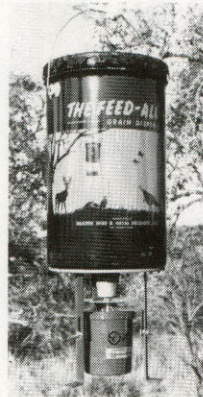


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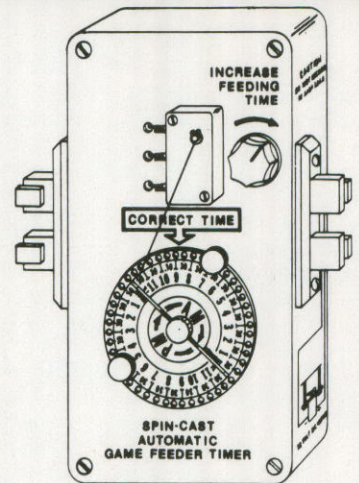
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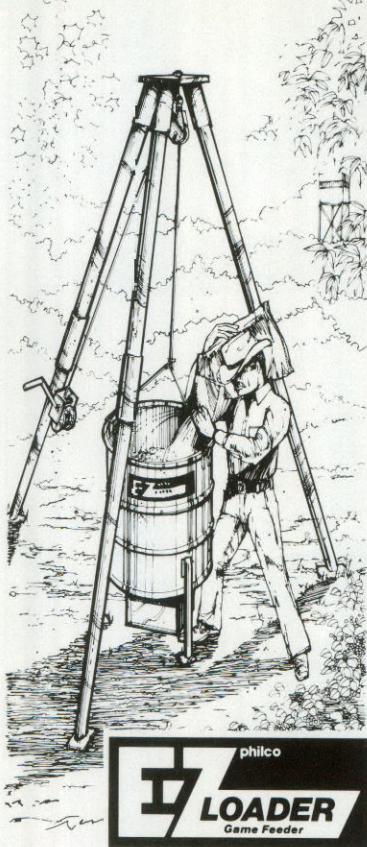
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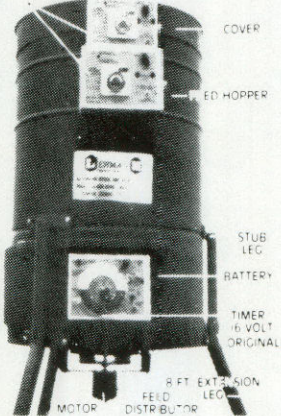
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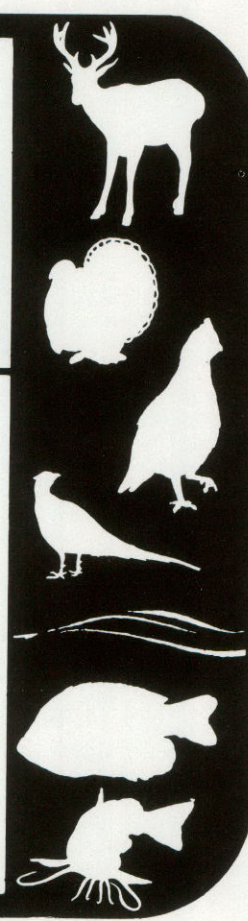
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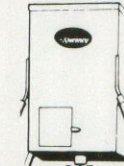


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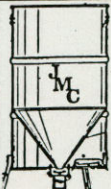
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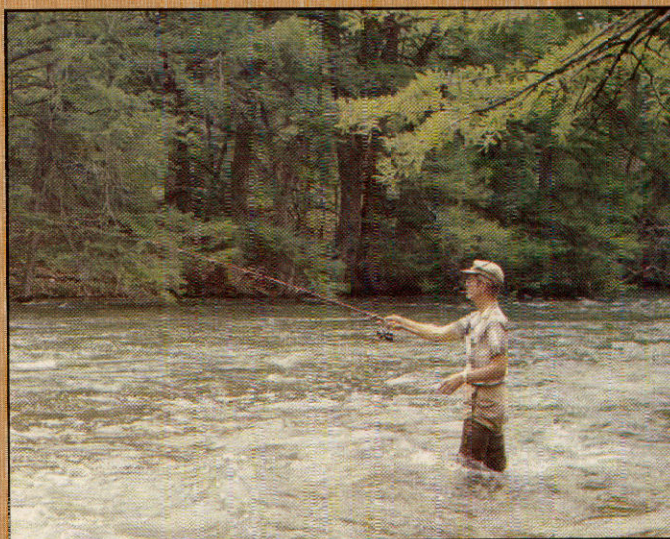
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Young Naturalist

Ghost Crabs

by Ilo Hiller

Although it lives on land and breathes air, the ghost crab is tied to the sea for its existence.

Hatching in the sea, the ghost crab begins its life as a tiny larva, called a zoea (zo-EE-ah). It can swim, but because of its miniature size, it is at the mercy of the sea. It drifts helplessly in the currents along with billions of microscopic plants and animals, known as plankton, on which it feeds.

The tiny zoea looks more like a shrimp than the ghost crab it one day will become. However, during the last stage of its sea life, the zoea molts, casting off its outer layer to expose a round, compact body with legs folded tightly against it. This is

the form that washes ashore. Once there it molts again, exposing a tiny, air-breathing ghost crab smaller than a dime.

The gills in this new form have lost the ability to remove oxygen from water as the zoea's did, so the young ghost crab will drown if submerged for long. But it still must keep the linings of its gill chambers moist with seawater so it can remove oxygen from the air.

To moisten these gill linings, the crab tiptoes in its sideways fashion to the water's edge. There it stands, one side facing the water, waiting for a wave to roll in and cover it. The claws on the four legs toward shore cling to the sand, anchoring the

crab against the pull of the wave that eventually will wash over its body. As soon as the covering wave recedes, the crab dashes ashore. Mission accomplished. This action is repeated whenever necessary, but usually occurs only two or three times during a 24-hour period.

Most of the daylight hours, when the sun and sand are hot and the beach is crowded with people, the ghost crab stays hidden in a burrow

Disturbed sand and tracks reveal the burrow's opening (right), but the sun and wind can erase this evidence in no time. The sharp direction change in the tracks to the left of the burrow is a common ghost crab characteristic.

John L. Tveten





underground. For this reason, it spends its early morning hours digging a new burrow or making improvements to an old one.

The four running legs on the side that has the smallest pincer do most of the digging. The sharp claws on the tips of these legs scrape at the sand, dragging it toward the crab's body. When a lump of sand builds up, the crab wraps its digging legs around it and uses the other four legs to pull itself and the sand away from the burrow entrance. Its eyes, on their fold-down stalks, scan the area for danger. The largest pincer is held ready for defense while the crab transports the sand. Returning to the digging site, it repeats the process.

Soon there is a hole deep enough to hold its body. As the tunnel goes deeper, the crab must make longer trips to move sand from the digging site at the bottom to the mouth where it is deposited. The tunnel may extend four feet down. Occasionally the largest pincer is used to push sand to the surface, but once there, the digging legs take over and haul the sand to the top of the growing mound at the tunnel's mouth. Later this mound will be carried away from the entrance in countless trips. The little piles of moist sand deposited at the end of

each outward trip soon dry in the sun and blow away.

Only a small hole is left to show where the burrow was dug, and the crab often plugs it from inside by dragging a couple of wads of wet sand into the opening. The ends of the walking legs remain outside to pat the plug into place. When they are drawn inside, only tiny holes remain. These and any other signs of the burrow's presence are quickly erased by windblown sand. In addition to concealing the burrow's location, this plug probably helps control the temperature and humidity inside.

The ghost crab usually stays hidden in a small chamber at the base of the tunnel during the day, but occasionally one will venture forth. If surprised while running about its business, it will try to return to its burrow and disappear below. However, it also can hide itself in a shallow depression in the loose sand. A quick squat, a few wiggles of the legs and body and all is buried except the eyestalks. You probably will pass by without even seeing them, but you can be sure those eyes will be watching.

The ghost crab's eyesight is well developed, and it easily can see moving objects as far away as 300 feet. It has compound eyes like those of insects, with each eye

made up of thousands of individual units. As each unit transmits its small view of the world, a complete composite picture is made. To help you understand how all these tiny parts can make a clear image, magnify a small portion of one of the color pictures in this magazine with a high-powered glass. You will see that the printed image consists of thousands of tiny colored dots. Each dot contributes its part to the whole picture as does each unit in the crab's compound eyes.

Toward evening, when the beach begins to cool and most visitors have gone home, the ghost crab clears the daytime plug from its burrow entrance. It then stands motionless in the shadow of the opening and surveys the surrounding area for danger. Its coloring blends so well with the sand that only the most observant person will notice it, and then only when it moves. If no danger is seen, the crab takes a few steps away from the opening and stops again to check for danger. Gaining confidence it moves again, stops and blends into its surroundings. Eventually this zig-zag, stop-and-go method of travel will bring it to the water's edge where it will wet the gill linings that have lost their moisture during the day.

The ghost crab can move forward and backward, but travels sideways the best. It is capable of quick bursts of speed, which you will discover if you ever try to catch one. It stands on the outer edges of its sharply pointed, turned-in leg claws. Its sideways run leaves parallel trails of slanting footprints that are easy to follow across the sand. Cruising along at its own pace, it uses all eight legs. However, when pursued, it lifts the back pair clear of the ground and runs only on the front six, covering six or seven feet per second. Perhaps

Quite a mound of sand may develop during the digging process (right). When the burrow is done, the excess surface sand is carried away, leaving the burrow area almost flat (left). This allows the ghost crab a clear view of the surroundings.

Leroy Williamson



eight legs are too many for it to keep in the proper sequence at high speed.

It was mentioned earlier that the crab's pincers are used for defense and as a bulldozer-type tool, but these modified legs are versatile and can do much more. As would be expected, they serve as the crab's hands. They hold its food, search through debris for tasty morsels and probe the wet sand for tidbits the waves may have brought in and buried.

They also could be compared to a knife and fork or chopsticks as they cut, tear and transport bits of food to the mouth. After each meal, the crab uses the smallest pincer as a toothpick to clean its grinding teeth.

The pincers also play a role in the courting procedure and are used as a threat to fellow crabs. Special ridges on the inner edge of the large pincer produce a warning sound when rubbed against a row of five ridges located on the upper part of the claw arm almost where it joins the body. Researchers have discovered that the ghost crab can make at least three distinct tones by rubbing different areas on the

row of ridges. On the upper end, the five ridges are coarse and separated from each other. In the middle the ridges are finer and closer together, and in the lower third there is very little separation between very fine ridges. Additional variations in sound occur as the angle and speed of rubbing are changed.

Since only one ghost crab can occupy a burrow, the resident crab sounds a warning if an intruder attempts to enter. This warning consists of a few low, broken tones. If the intruder is another ghost crab, it will heed the warning and move on. If the intruder is not a ghost crab, the resident will increase its warning sounds. The low broken tone will rise in loudness or shrillness until it becomes a continuous, low-pitched whirr or high-pitched "growl." The burrow acts as a resonator and increases the sound.

The ghost crab's hearing is well developed, too. It can hear sound transmitted in the air and through the ground. The crab communicates through the ground by rapping on the sand with its large pincer. This rapping sound serves

as a territorial warning for other males and as a courting call to attract females.

It is easy to see that the ghost crab's pincer serves many purposes. It also can give a painful pinch and, on occasion, the smaller one may be left clamped to an enemy while the rest of the crab makes its escape. Given enough time, the crab will grow a replacement pincer.

In midsummer the mature female ghost crab will have an added reason for making periodic trips to the water's edge. Attached to her abdomen is a bulky mass of greenish eggs that she must expose to the refreshing seawater. She clings to the sand and hugs her eggs tightly as the wave washes over her body. When most of the suspended particles of sand in the receding water have settled, she relaxes and lowers her abdomen, exposing the eggs. If she happens to find herself in relatively still water, she may quickly rock her body, almost turning upside down, to force the water around and through the egg mass. From these eggs will hatch the tiny ghost crab zoeas, and the life cycle will begin again. **



Leroy Williamson

Letters to the Editor

Super Hospitality

I picked up a copy of your magazine while visiting the LBJ State and National Parks, and would like to enter a subscription. We thoroughly enjoyed our visit to the park and the State of Texas is to be commended on a wonderful job. The hospitality was super. We want you to know how much we enjoyed our visit to Texas.

Jack Strickland
Baxley, Georgia

At Least He was Warm

The article on prairie dogs by Ilo Hiller in the February issue was excellent. It brought back memories of my childhood when our family lived near Quitaque. My dad was plant manager for a large gravel mining company and we lived in a company house out at the plant. We had to drive back and forth to school in Quitaque, and drove through a prairie dog town with thousands of prairie dogs. They actually covered miles of the mesquite pastureland with their burrows.

As kids will do, we made stove pipe traps and captured baby prairie dogs for pets. The traps were made by placing a piece of window screen across the end of a stove pipe section and a slanting flap-type door in the other end. We would shove this pipe into the opening of a burrow, and when the prairie dog tried to come out of the burrow it would raise the flap door and get into the pipe but not back past the slanting door. We caught hundreds of prairie dogs like this.

One cold winter, one of my pet prairie dogs froze stiff and I thought he was dead. I put him into the oven of my mother's cook stove and warmed him up real good. He came back to life but soon lost all his hair. I had a live pet but his skin was black as coal.

Gene Prickette
Waco

Texas Fisheries

I am a native Texan, fourth generation Midlander and one of your newest subscribers. As an amateur photographer and an avid fisherman, I am so impressed with your magazine.

The article "Texas Fisheries" in the February issue was excellent. I hadn't realized that walleye had been stocked anywhere but Lake Meredith. We learned

to enjoy the walleye on Lake Sakakawea in North Dakota and look forward to a weekend on O.C. Fisher Reservoir soon.

Thanks for a magazine of quality that all Texans can and should be proud of from one Texan who really appreciates it.

Doug Lunsford
Midland

Mackenzie State Park

I enjoyed the article, "It's a Dog's Life" by Ilo Hiller in your February issue. My late father lived close to Lubbock, and when we went to town we would always go see the prairie dogs at the park. Mrs. Hiller failed to mention that Mackenzie State Park is in Lubbock.

Rena Petty
Jarrell

Nothing Can Compare To Texas

I have been receiving your magazine about five years, and enjoy it now more than ever. We are a Navy family stationed on Guam. The island is beautiful, but nothing can compare to Texas. Your articles and pictures are just great. Every month we look forward to your magazine so we can see what's happening at home. Thanks for bringing us a little Texas beauty.

Patricia Blockman
FPO San Francisco

Christmas Card

Thank you for the December issue, a most delightful Christmas card in this land of ice and snow.

We have enjoyed the magazine over the years almost as much as we have enjoyed our many trips to Texas. The day-long horseback ride to the South Rim of the Chisos Mountains in Big Bend National Park was a rite of passage for both our children when they were five years old. Our oldest made that trip more than 20 years ago, and now travels to Texas herself to watch the desert bloom. My husband and I hunt quail in

Texas every couple of years and never cease to marvel at the new wonders we find on every trip.

Please ignore the people who say you print too many pictures. Your magazine is a feast for the eyes to those of us who cannot spend all our time in your magnificent parks.

Barbara Jensen
Anoka, Minnesota

New Subscriber

I have subscribed to many hunting and wildlife type magazines and have finally discovered *Texas Parks & Wildlife*. I have only received four issues but it didn't take long for me to find out what a fine magazine it is. Along with beautiful photographs, it is very informative on wildlife and conservation. *Texas Parks & Wildlife* will be in my household for many years to come. I would highly recommend this magazine to any outdoorsman.

I would also like to thank Ray Sasser for his fine article on white-tailed deer hunting entitled "Does Weather Make a Difference?" in the November 1982 issue. I have recently written an English paper at Texas A&M University on the effects of weather on deer hunting. Sasser's article helped me a lot.

Clayton B. Wilkins
College Station

BACK COVERS

Inside: Life on the Texas frontier was filled with hardships that are foreign to 20th century Texans, as this reenactment society demonstrated at Fort Richardson State Historical Park. Established in 1866, Fort Richardson is one of six 19th century forts in the Texas State Park System. (See story on page 16.) Photo by Glen Mills.

Outside: Butterflies can be distinguished from moths by their antennae. This butterfly of the genus *Phyciodes* has antennae with clublike knobs on the ends, typical of all butterflies. The polyphemus moth on the front cover has feathery antennae, as do several other moth species, while others may have antennae resembling tiny plumes. Photo by Leroy Williamson.



