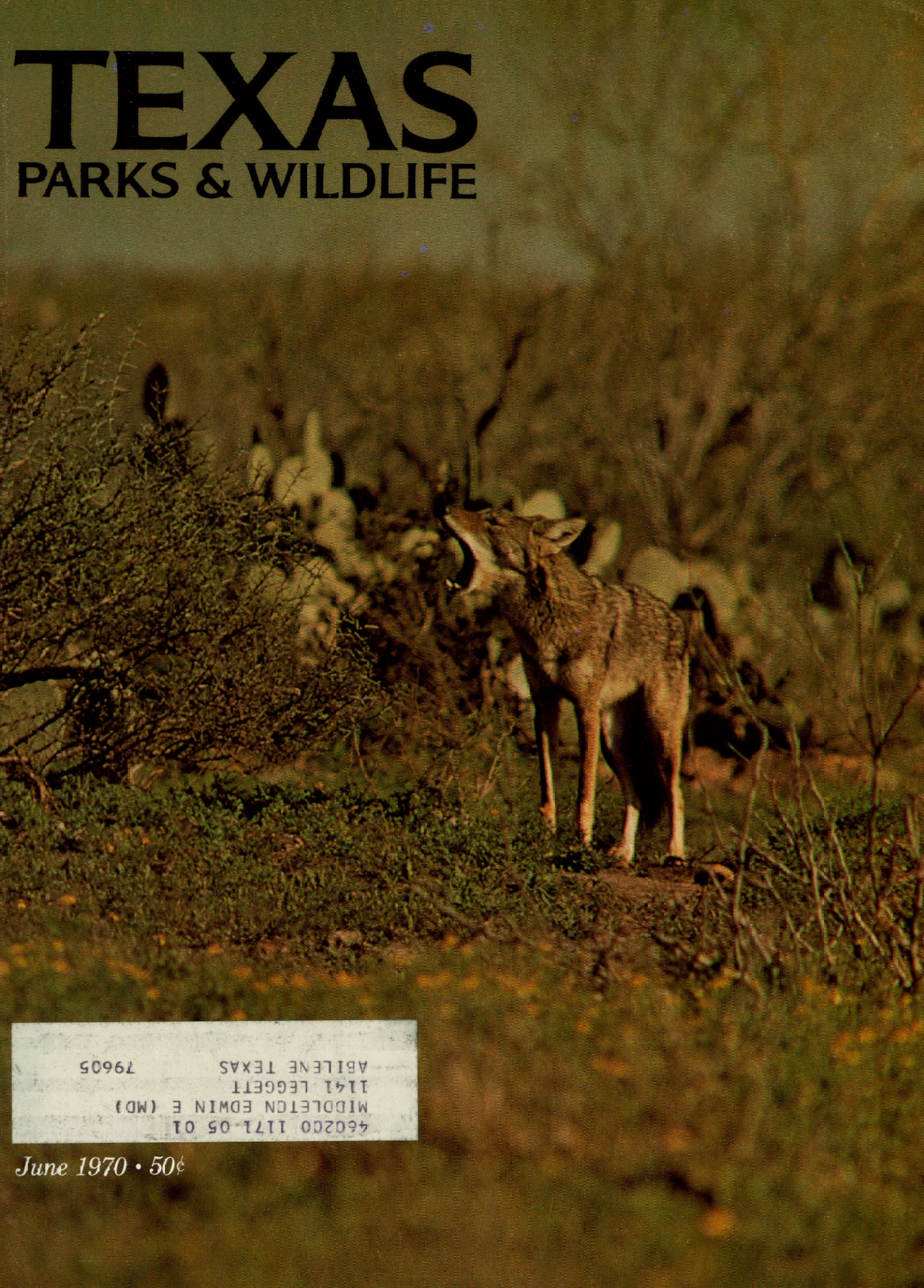


TEXAS

PARKS & WILDLIFE



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McGOWAN

OUTDOOR NOTEBOOK

Nocturnal habits of *Bufo debilis* usually keep him from the public eye. However, this secretive toad prospers in arid regions where it has adapted to the climate by a short reproduction cycle in the temporary pools formed by summer showers. A rain brings the toads out of hiding to sing, mate and lay strings of eggs. In less than 20 days, the tadpoles become toads. The only obvious distinction between the sexes is the difference in throat color — dark for the males, yellow or cream for females. Aside from the throat color, both sexes are bright green with black spots and measure under two inches. — Nancy McGowan



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magazine**

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TEXAS PARKS & WILDLIFE

... first place winner of the 1967 and 1968 international award for magazine excellence given by the American Association for Conservation Information.

Cover: Coyotes, *Canis latrans*, are one of the most colorful animals of Texas. They bark like dogs, to whom they are related, but they are best known for their haunting, eerie howl. Photo by Perry Shankle.

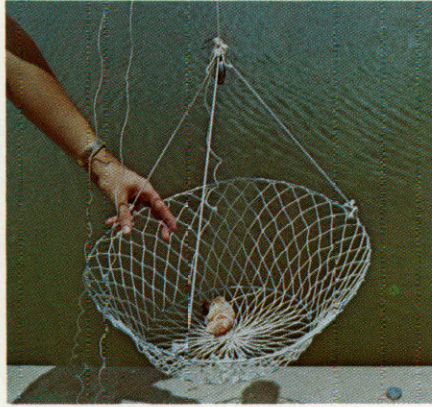
A Line On **CRABBING**



John Suhrstedt



A simple net can be baited with beef or chicken wings or neck ...



... and lowered into the water all the way to the bottom.



In most cases, when you pull the net up, you'll have a crab.

by Richard L. Benefield Coastal Fisheries Biologist

SPORT CRABBING has become a popular pastime along the Texas Gulf Coast. Like many other types of fishing, crabbing is done both commercially and for personal enjoyment.

Fishing for the blue crab is generally a group affair consisting of three to five persons and handlining is the most common method used.

A handline is simply a strong line, bait and a weight. When a crab starts eating the bait, the line is gently pulled in or up to bring the crab within reach of a dip net. With luck the toothsome invertebrate is scooped up and dropped into a bucket or sack.

Some dedicated crabbers use a trotline system consisting of two stakes with a line tied between them. Several stagings with bait are attached to

the main line and systematically checked.

Crab nets and wire crab pots (traps) are also used. The pots cost from \$3 to \$5 depending on size and construction, but the average crabber does not care to make this investment. Also the use of crab pots usually takes the sport out of crabbing for most participants. Crab pots are generally utilized by people living near the water where they can keep the traps baited and run them in their leisure time.

The right bait to use is a debatable question among crabbing enthusiasts. Some will swear by chicken necks and wings while others prefer beef scraps. The availability of chicken in the home refrigerator and its toughness to withstand several hours of crab fishing makes it a popular bait. Com-



Leroy Williamson



Leroy Williamson



Photos by John Suhrstedt

To increase the catch, a trap can be made of chicken wire. Instructions for making this trap were in the June, 1969 Texas Parks and Wildlife



mercial crab fishermen usually bait their pots with scrap fish.

The size of catches varies. The average take is generally 12 crabs per trip, although lucky or skillful crabbers land as many as six or seven dozen. Then there are those who look at crabbing not necessarily as the main objective of the trip but as an excuse to get out and enjoy nature. Their catch may be only three or four per trip.

Spawning blue crabs, *Callinectes sapidus*, fill the Gulf surf during July and large numbers of people flock to the beaches to take advantage of this season. Sponge (egg-carrying females) and spent (spawned females) crabs are easy prey for people using dip nets. **However, Texas law now prohibits the keeping of these sponge crabs.**

A recent survey of the Galveston Bay fishery by Parks and Wildlife biologists provided information to substantiate the popularity of sport crabbing and its impact on an area. Data gathered from the survey determined that sport crabbing contributes considerably to the area's economy.

Department personnel counted 41,000 crabbers and interviewed 887 from April through December of 1968. The survey area extended from Baytown to the Texas City Dike and from Rollover Pass to West Galveston Beach. Fifty stations, each selected for ease of public access, were established for the study. Sites that were checked for crabbers included bridges, ditches, bayous, piers, rock groins, jetties and beaches.

The survey showed that the crabbing activity usually depends upon the weather although people were observed crabbing throughout the year. Sportsmen turn out in earnest at the first signs of warm weather in the spring; however, more people fish during June, July and August. July was found to be the most popular month, and the most fishermen were noted on weekends and holidays. The popularity of the summer months was expected because many people are on vacation, and the cooperative blue crabs are readily available at that time. After August, crab fishing activity declines and comes to a virtual standstill in December.

In the Galveston Bay area, sport crabbing is a localized fishery. Fishermen from 17 Texas counties were represented in the survey. Of 887 persons interviewed, Harris County ranked highest with 47 per cent; Galveston followed with 39 per cent. These two counties in which most of the crabbing areas are located produced 86 per cent of the fishermen. One couple from Ector County in West Texas stated that crab fishing was one reason for selecting this area for a vacation. Most out-of-staters said that crabbing was a first time experience for them. These non-Texans, about three per cent of the total interviewed, were from Arkansas, California, Florida, Kansas, Louisiana, and North Carolina.

The fairer sex are ardent crabbers and made up



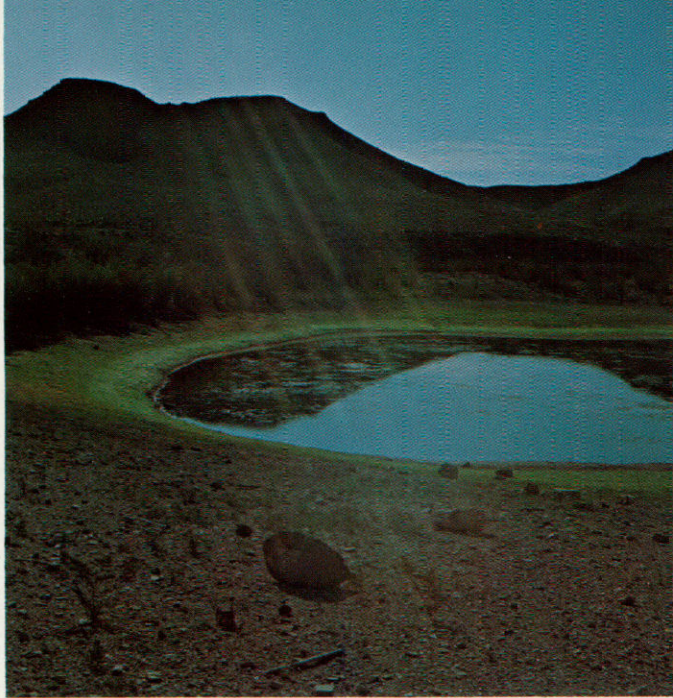
Biologists counted 41,000 people and interviewed 887 in this study to determine what type of people enjoy this sport.

38 per cent of those interviewed. Children under six years of age comprised 22 per cent of the total. Also, sportsmen often combine crabbing with fishing. Of 1,775 groups encountered, 15 per cent did both. Generally, it appears that adults while fishing permitted their children to crab in order to keep them nearby. Often, the children provide the only seafood to take home.

Like fishing, crabbing requires money. Expenses involve bait, lines, nets, food, drinks and gasoline. The average cost is about 80 cents per individual or \$3 per group. Cost varies with the closeness of crabbers to the fishing area and the length of each trip. Some lucky individuals are able to crab from their back yards while others must drive many miles. Because crabbing provides a much needed recreational outlet for area residents and others, it is most difficult to place a dollar value upon the pleasure received by each crabber.

Unlike many activities, crabbing is relatively inexpensive and enjoyable throughout much of the year. It is an activity that contributes to the economy of an area, both as a commercial operation and a popular recreational activity. * *





Improvements made on the Black Gap have greatly increased the wildlife there.



On the Shurley Fiat grass grows in the areas where check dams retard erosion.

RUGGED WORKSHOP

by W. R. Long Information Officer, San Angelo

Photography by Reagan Bradshaw

VISITORS to the Black Gap Wildlife Management Area may find themselves awed by the desolate beauty of the rugged terrain so typical of the arid mountain habitat of the Trans-Pecos Ecological Region.

Located in Brewster County, Black Gap Wildlife Management Area is 55 miles south of Marathon and covers more than 100,000 acres. It is the largest management area in Texas, and has approximately 20 miles of the Rio Grande as its southern boundary. The area derives its foreboding name from a pass between two black basaltic uplifts.

It is being used to study the ecology of the desert mule deer and other wildlife which abounds in the area and to investigate methods of restoring depleted West Texas range lands. Domestic livestock has been excluded from the area in order to enhance

conservation management practices and research on wildlife. This exclusion has greatly expedited improved range conditions.

Principal game species on the area are desert mule deer, javelina, pronghorn and scaled quail. A small herd of desert bighorn sheep has been introduced in the hopes of reestablishing the animal in Texas. Another species introduced into the area is the Gambel's quail, a plumed quail that now exists only along the Rio Grande from El Paso to about Presidio. Mourning and white-winged doves, ducks and many other types of large and small birds also inhabit the area. Reptiles and many small mammals may also be found in abundance.

The general study of the ecology of the desert mule deer is comprised of several related specific studies such as food habits, reproduction, move-



ment, hunting pressure and the relationship of the number of deer killed to weather and habitat. In the deer food habit study, samples from the rumen, or front part of the deer's stomach, are taken, and the frequency of appearance of a species of plant is noted. Analysis of such data has shown that the mule deer is selective in its feeding habits and grasses do not play as large a part in its diet as one might imagine. Browse species make up approximately 91 per cent of the volume of its diet, forbs 8 per cent and grasses 1 per cent.

To study the conception rate and breeding potential of the desert mule deer, reproductive tracts of doe deer are taken and preserved. They are later sectioned to determine conception rates and ovulation incidence of the species. Usually 85 per cent of the mature does on the area conceive. Since this is a rather high figure, it creates some serious questions yet to be answered because of the small annual increases in the herd. It was also discovered that, at least on occasion, there were three breeding peaks, one in late November and early December, another in early January and a third in mid-February.

Nearly every deer hunter in Texas knows that there has been an annual public hunt on the Black Gap for several years. What he may not know is that the hunt is really a management and research practice and that the deer he kills provides vital information from which the biologists who work in the area can better understand the dynamics of the deer herd. Measurements are taken to help determine growth rates as they may relate to range conditions, age, herd composition and geological phenomenon. The hunt also provides the stomachs and reproductive tracts used in the food and reproduction studies.

Another project which is unique in Texas deals with restoring desert bighorn sheep to the State. At one time large numbers of these animals roamed the western part of Texas, but as land-use practices changed, they became extinct in the State by 1957. They have now been reintroduced into Black Gap through trapping and transplanting from Arizona.

The animals are contained in a 427-acre holding pen surrounded by an eight-foot fence, made virtually predator-proof with the addition of an electric wire. No sheep have been lost to predators since the foundation herd of three ewes and three rams was introduced in late 1950's. The herd has now increased to over 50 animals. Some of the young produced from this herd are now scheduled for liberation in suitable mountainous habitat on other parts of Black Gap.

Since the region's average annual rainfall is only about seven inches, the area is well suited to experimentation with new methods of efficiently collecting and utilizing moisture in all its forms. The strategic location of water storage sites and vegetative food plots have greatly enhanced the utiliza-



tion of the range by wildlife. Metal and concrete water catchments and water storage sites have been developed and located in isolated sites where previously no water was available.

Biologists are also studying ways that an uninhabitable area can be made to attract and maintain wildlife by artificially controlling and improving the physical nature of the resource. In one experiment, a 2,000-acre tract, Shurley Flat, was selected for rehabilitation since it had rapid drainage with sparse shallow-rooted vegetation — factors which discouraged its use by wildlife.

To test the feasibility of certain habitat improvement techniques and the treated area's ability to hold and maintain wildlife, 5,000 check dams and 15,000 feet of net-wire water diversion terraces were placed on one half of the area. The other half was left in its original condition. The improved area was then seeded and census transects have been established on the entire test plot to determine any changes in both wildlife and vegetation densities.

Although no definite conclusions have yet been made, it is apparent that the vegetation will do well when the water is slowed and spread over the land. In areas where vegetation has become well established, holding capacity of the soil has been markedly improved.

Visitors in the area may be interested in knowing that fishing on the Rio Grande is open to the public by permit. During most of the year the river affords good fishing. Fish species include blue, channel and flathead or yellow catfish and a small number of other fish native to the river. Fishing is allowed at all times except during public hunts.

Although fishing is on a permit basis, permits involve only the formality of signing in and out of the area. The area manager can warn and give di-

rections to those who visit to fish, so registration lessens the hazards involved in driving 15 miles of unpaved, often rough roads from the area headquarters to the river's edge. Although 25 concrete shelters have been built, facilities are primitive and visitors are advised to bring all supplies, car tools and parts such as spare fan and generator belts. Water near the shelters is impotable, and fresh water or water purification chemicals must be brought in by the visitor.

The visitor is allowed to leave roadways only during periods of public hunts, and regulations on the Black Gap forbid the collecting of rocks, artifacts, fossils or plant species. Only legally assigned hunters are allowed to bring firearms on the area during controlled public hunts, but everyone may be armed with a camera since the mountain peaks, desert scenery, vegetation and vast expanses of Trans-Pecos country offer an inviting locale for outdoor photography. * *



Outdoor Books

by Rebecca Welch



SNAKES: THE KEEPER AND THE KEPT by Carl Kauffeld; Doubleday & Co., Garden City, N. Y., 1969; 248 pages, \$5.95.

According to Desmond Morris, author of *The Naked Ape*, humans are most fond of animals which remind us of ourselves to some extent—that is, that are capable of responding to humans, exhibit some sense of “personality,” and have a body shape at least roughly resembling the primate. This would seem to exclude insects, reptiles or amphibians. However, amateur herpetology, or the study and collection of snakes, is becoming an increasingly popular hobby.

The author of *Snakes: The Keeper and the Kept* is no amateur, however. He has been director and curator of reptiles at the Staten Island Zoo and has worked professionally with reptiles for nearly 40 years. His intensive knowledge of snakes, coupled with a wit and enthusiasm for these strange creatures, make him an enlightening and entertaining author. In a conversational style Kauffeld details his experiences on snake hunts and what caused his interest in one variety or another. Also, he exhibits a keen appreciation of the lard—its beauty to man as well as its usefulness as snake habitat.

Kauffeld is not unaware that most people find snakes fearful or repellent. So, in his first chapter he addresses himself to the assumed objections of the reader. His own interest in snakes stems basically from a sense of their beauty and variety, and he attempts to convey those impressions. “Surely the splendid colors and intricate patterns, beauty of line and motion, with which nature has endowed the snakes so generously, are sufficient to attract anyone who has a love of beauty and a reverence for life.”

This “reverence for life” recurs throughout Kauffeld’s book. He is sensitive to the preciousness of liberty and to the freedom of wild creatures, and although he is a collector his major concern is in the successful adaptation of his captured specimens.

The lure of the Davis Mountains of West Texas, Kauffeld reports, had drawn him nearly all his life. “The Davis Mountains—there was a name to conjure with.” So forty years after reading about *Elaphe subocularis*, or Trans-Pecos Rat Snake as he is commonly known, Kauffeld set out to collect a specimen for the Staten Island Zoo. He and his family camped out on hard-baked flats surrounded by West Texas ocotillo, yucca and prickly pear cactus, and they moved southward under the burning sun “blistering hot... (with) nothing to relieve the dry heat that blew in on us as if from a blast furnace.” In these surroundings, so familiar to West Texans, Kauffeld searched for good specimens. We can read with great pleasure his descriptions of the country and his adjustment to it, and may appreciate as well his enthusiasm for the western part of our State, at once so austere and familiar.

This reader had always considered snakes objectionable, but Kauffeld’s easy manner, his care for these animals and his success in conveying their variety and beauty, has done a good bit to remove some of the misconceptions and to awaken interest in these graceful creatures.

THE MOUNTAIN LION by Iona Seibert Hiser; Illustrated by J. M. Roever; Steck-Vaughn Co., Austin, 1970; 30 pages, \$2.50

Written for children, *The Mountain Lion* capsulizes the natural history of the cougar in an easily readable fashion with some emphasis upon the animal’s past in nature, according to Tennyson, “red in tooth and claw.” The author devotes a good deal of space to the cougar as a predatory beast, describing his hunting habits even to the way in which prey is killed and eaten. The value of the approach is that the author is frank about the violence inherent in the animal’s way of life while including a

hearty conservationist message at the end. It is most useful to encourage children to understand that not only the “good” or harmless animals are worth preserving.

Although the short book covers in a general but interesting fashion the mating and hunting of the cougar as well as a description of his appearance, habits and habitat, one only wishes for more information concerning the animal’s peculiarities—his part in folktales, for example, add greater elaborations upon his curiosity toward man. Perhaps this is only to say that a well written account of an animal serves to awaken interest and a desire for more information. It may well be that the creation of this desire is a sufficient and creditable goal for a children’s book. At any rate, the information included is of interest, the writing is clear, and the accompanying drawings are illustrative of the magnificence of these large native cats.

THE AMERICAN WEST by Ann and Myron Sutton; Random House, N.Y.; 270 pages, \$20.00.

The American West is one of a type of publication which usually surfaces near Christmas—handsome typography, heavy pages with rich color plates, and costly—the sort that undoubtedly sells well during gift-giving periods. In this case the book would be an addition to a library despite its superficial appeal since its excellent prose makes it far more than an expensive picture book. The text is fresh and vibrant, and the authors present the unity of life, rather than fragmenting the material into categories of plants, animals, geography, etc. Although each chapter concerns a unique geographical or ecological area, the material in it covers a multitude of topics—plant and animal life, history, tall tales and material on geographical formations. It is natural history in the most positive and encompassing sense.

The desert environment of far West Texas to the rich rain forests of the Northwest ending in western Canada is the geographical sweep included in *The American West*. The only chapter of specific reference to Texas is the first, “Sun, Sand, and Saguaro: The Hospitable Desert.” It is full of surprises and discoveries as the authors trace the growth and adaptation of various life forms to the severity and harshness of desert habitat. Contrary to normal supposition we find that:

Instead of leading to monotonous biological communities, this arid climate, combined with elevation, results in distinctive plant and animal associations—perhaps because, as ecologists suggest, the

diversity of habitats may be greater than that of any other region. When we consider the sunny and shady canyon walls, springs, streams, open flats, rocky foothills, and grassy uplands, this is not surprising. It is difficult to contrive a single definition to cover so diverse an environment.

With this in mind, it is not surprising that the desert should, then, be teeming with life, and hardy, vigorous life at that.

Much of the material is anecdotal. The Suttons explain the "language" of the American West with its use of Spanish. The terms of Spanish derivation "describe the fundamental physical character of the southern basins and ranges, a region that is some seven hundred miles wide and extends southward far into Mexico." The authors speak of the history of the great Staked Plains and the variety of possible origins of its evocative name. And they relay the majesty of the Big Bend country, again combining old tales, history and natural history.

The Suttons' subtlety in presenting conservationist platforms is remarkable in that they paint a canvas of changing landscapes teeming with busy life, combined with an enriching sense of the country and its history, so that the reader is encouraged on his own to consider the results of neglect and devastation. The final chapter, "Prospects for Nature in the West," is not half so persuasive as the visual and descriptive material depicting the country in its natural state.

Long Shots, Short Casts

compiled by Neal Cook

Valuable Weasel: The extremely valuable "ermine" which women would like to have their coats made of is the white winter coat of any number of weasel species.

Only You Can Prevent It: One cubic yard of trash is deposited on each mile of American road every month, according to a national survey by Keep America Beautiful, Inc. Motorists drop an average of 1,304 pieces of litter every month on every mile of Interstate and primary highway. Paper goods accounted for 59 per cent; cans, 16 per cent; and bottles and jars, 6 per cent of this litter. Miscellaneous trash made up the remaining percentage. Another survey showed that men littered twice as much as women and that people between the ages of 21 and 35 litter twice as much as those between 36 and 49 and three times as much as people over 50. The only way for these figures to be changed is for everyone to make sure that they don't carelessly throw their garbage out for other people to have to look at.

Ecological Goof: In South Africa, the people deemed hippopotamuses worthless creatures and shot them on sight. As a result, it caused a debilitating disease called schistosomiasis to become widespread among the inhabitants. Before they began to disappear, the bathing hippos stirred up silt in the rivers, and it was carried downstream. But the rivers filled with silt due to their absence and flood carried it over large land areas where it created favorable conditions for a type of snail which carries schistosomiasis.

Beginner's Basic: In shooting terminology the word "rib" refers to the raised bar atop the barrel of a shotgun. This bar, which forms the sighting plane, extends from the breech to the muzzle. Many guns have barrels which are fitted with a ventilated rib. This is a sighting bar which is supported by stanchions that form a series of open spaces between the rib and the barrel. Its purpose is to break up the heat mirage that shimmers up from the gun barrel and distorts the shooter's view of the target.

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M. GOWAN

European BLACKBIRD

by
Dennis Russell
Wildlife Biologist

ON THE THIRTEENTH attempt, the European starling, *Sturnus vulgaris*, was successfully introduced into the United States. Because of this unlucky number, perhaps some ominous warning should have been conveyed. But Eugene Scheiffelin, a transplanted Englishman who missed the birds of his native country, wanted to try. He released 80 pairs of the birds into New York City's Central Park in the spring of 1890.

From this small nucleus have come the vast numbers that now cover the continent. By 1910, the birds had begun to nest in Connecticut, New York and Massachusetts. They spread rapidly west and south, and by 1930, starlings were found from Canada and Maine to Indiana and south to Georgia.

By 1945, starlings had reached Texas and the Pacific coast of California. They have now spread along the Pacific coast from Mexico to Alaska. During the winter, starlings are found throughout Texas, except in the Big Bend region. During the spring breeding season, the birds range in an area north of a line from Houston to Lubbock; however this range is slowly moving southward.

Starlings generally nest in a tree cavity made by a woodpecker or in a house, shed or other man-made structure. Starlings often choose a birdhouse intended for purple martins. Wooden houses

from which old nesting materials have not been removed seem to be particularly attractive. Nesting materials range from grasses and pine straw to old cigarette filters and Christmas tree tinsel.

From two to six eggs are laid by the starling between February and May. The young are hatched after a two-week incubation, and they immediately begin eating larval insects brought by their parents. After two or three weeks, they leave the nest, covered with a dull-gray plumage. The parents may then nest again and have another brood before the fall.

The young molt their full plumage by the end of summer. From a distance, the starling's winter plumage is black, but upon closer observation, purple and green reflections from the feathers may be seen. Cinnamon spots on the ends of the feathers give the birds a speckled appearance. These spots are worn away during the winter and by spring only the black of the feathers is visible. The deep black makes a startling contrast to the white or orange bill of an adult.

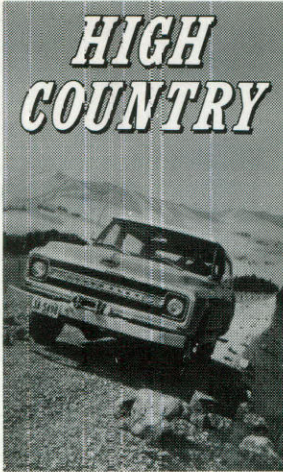
Studies in East Texas have revealed that the food habits of the starling are probably beneficial in that area. The summer diet consists mainly of grasshoppers, crickets and beetles. During the fall and winter, the birds begin to rely heavily upon hackberries and the fruit of the chinese tallow

tree. It is during these fall and winter feeding forays that the starling can become a pest to feedlot operators and fruit producers. Grapes, figs and cherries are especially vulnerable to depredation by large flocks of this and other "blackbird" species. In feedlots, starlings seem to be able to separate the high-cost protein pellets and eat them in preference to the lower-cost bulk items.

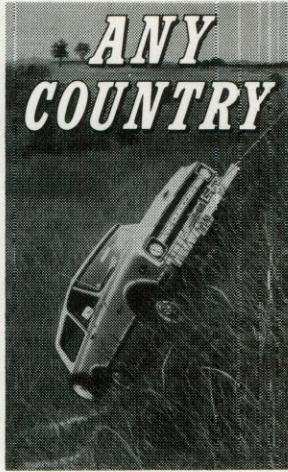
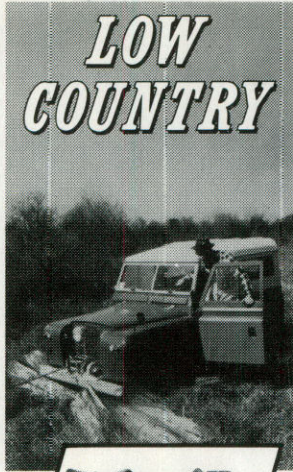
However, perhaps the starlings' grasshopper diet is a large enough benefit to the cattle producer to balance his cost in crop and feedlot depredation.

The starling, like the English sparrow, provides a startling picture of what can happen when a species is moved into a new area without careful study beforehand. In the starlings' native Europe, the population is held in check by diseases and the colder winter climates. When the species was introduced into this country, these factors no longer acted upon it, and the species began to spread.

As the population has built up, sickness and competition for food have begun to slow its growth. Many authorities believe that the starling population in the United States has now stopped increasing and perhaps is on the decline. One can only wonder how many species of native songbirds have suffered declines in their population to make room and provide food for these "European Blackbirds." **



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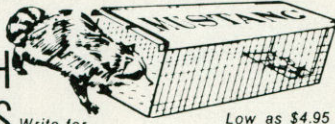
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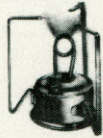
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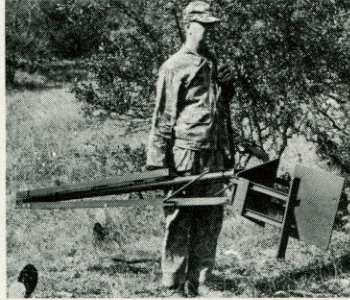
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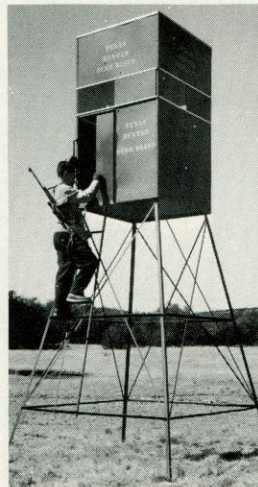


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TEXAS LAKES TRAIL

by
Mabel Lowry
Information Specialist

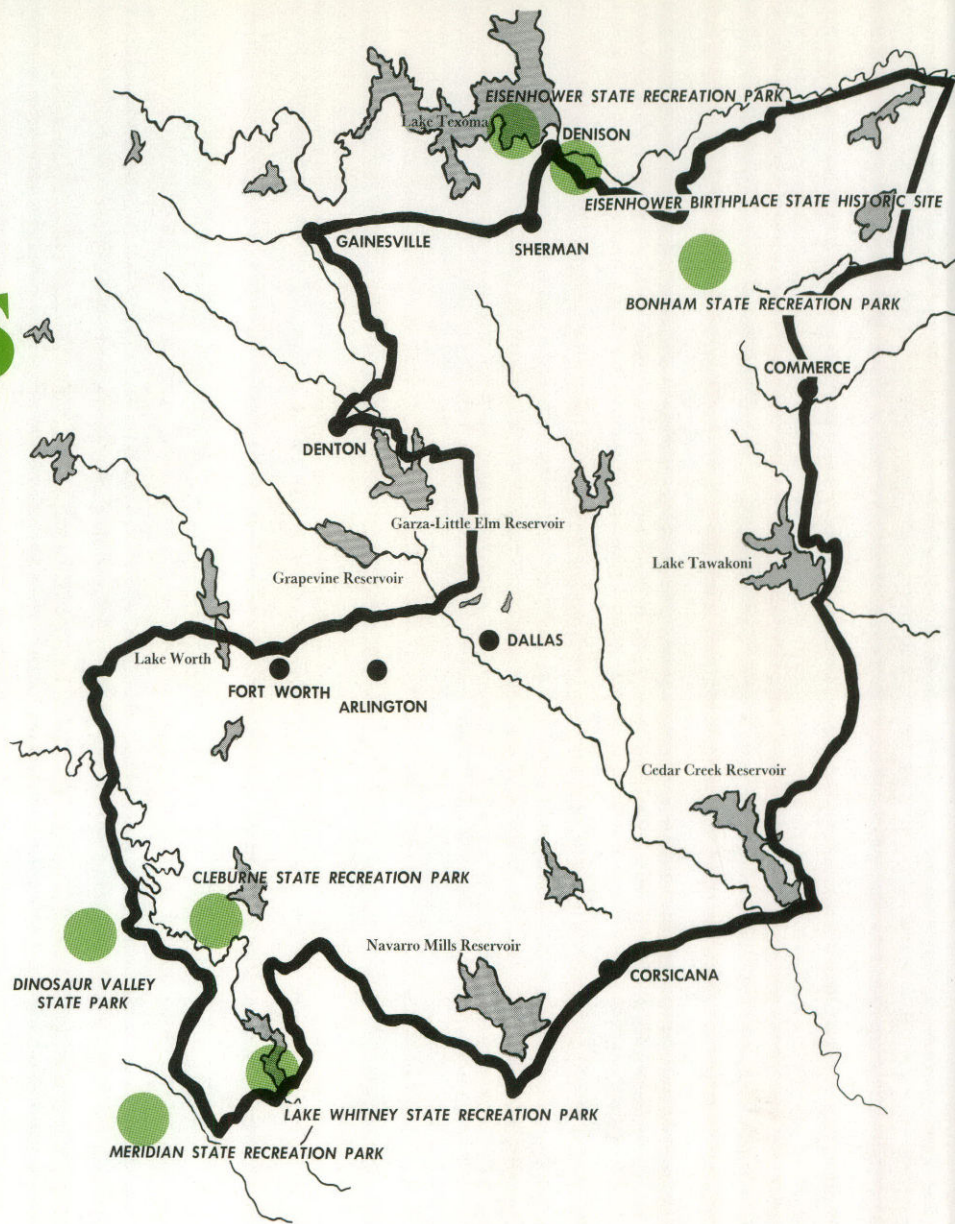
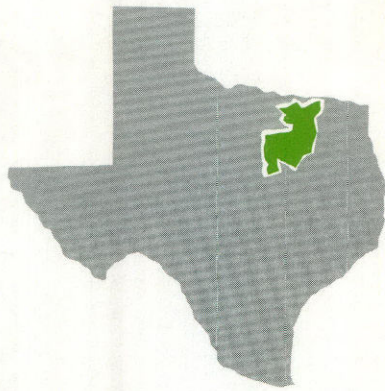
FROM FALCON RESERVOIR on the south to huge Lake Texoma on the north and from West Texas' Red Bluff Lake to gigantic Toledo Bend Reservoir on the Louisiana boundary line, Texas' lakes cover more acreage than those of any other state except Alaska. If flowing streams and small ponds are included in the total, fresh waters cover more than 6,000 of the State's 276,600 square miles, providing Texans with a favorite recreation.

The Texas Lakes Trail meanders through 657 miles of north-central and northeast Texas where

the concentration of these fabulous vacation spots is the highest. The tourist has a choice of any or all of dozens of lakes set in a varied countryside of plains, forests and hills, where every facility for family fun is available.

The lakes range from small quiet ponds to bodies of water navigable only by experienced freshwater boaters. Yet each provides its own special brand of recreation, whether it be fishing, boating, swimming, skiing, scuba diving or a combination of these; and each possesses its own unique scenic

TEXAS LAKES TRAIL



beauty. Along the lake shores are accommodations for picnicking and camping.

Seven State parks lie on or near the Lakes Trail. Of particular interest to Texans proud of the home state of two United States Presidents, the Eisenhower Birthplace State Historic Site has been restored as a living museum commemorating President Dwight D. Eisenhower's birthplace and early home at Denison; it is furnished in the style of the period of his birth. President Lyndon Johnson is honored in a State park on the Hill Country Trail.

A short distance west of Glen Rose is Dinosaur Valley State Scenic Park. Its 1,270 acres astride the Paluxy River contain excellent specimens of the tracks of three types of dinosaurs imprinted in the shallow waters of the river some hundred million years ago.

The remaining five State parks — Eisenhower, Bonham, Cleburne, Meridian and Lake Whitney — are primarily recreational.

On the south bank of beautiful blue-green Lake

Texoma, an immense reservoir between Oklahoma and Texas, is Eisenhower State Recreation Park. Called the "Queen of the Lakes" by boating and fishing enthusiasts, Texoma lives up to its royal name. Its matchless views, steep wooded shores, numerous islands, sandy beaches and placid coves attract sportsmen from all over the nation.

The fish population remains remarkably steady, and an estimated 86 species of fish thrive in its waters. Long a favorite with black bass fishermen, Lake Texoma has also been a prolific producer of many other varieties of panfish. Crappie and white bass (sandies) can be caught virtually the year-round. In spring, vast schools of sandies up to a half mile in circumference churn the waters as they feed on shad. At this time, they can be hooked by almost any angler who drifts alongside and casts a shiny lure into the frenzy.

When the day's catch has been hauled aboard and the boat secured, visitors to Eisenhower State Park use the park's facilities for family fun: sites



Cabin cruisers are popular on Lake Texoma because of its size.

for trailers and tents; picnic areas; and a playground.

Three parks have lakes enclosed within their boundaries for the use of the visitor. At Bonham State Recreation Park the lake covers 65 acres. The fishing is good, boating and swimming delightful and tenting on the old camp ground a popular outdoor pastime.

At Cleburne State Park, in addition to the lake, grassy slopes and tree-bordered shores encourage swimming, diving, hiking or just plain loafing.

A popular resort for vacationers since the early 1930's, Meridian State Recreation Park has a 70-acre reservoir fed by the waters of Bee Creek in cool, restful Bosque Valley. Picnic and camp sites, trailer sites, a children's play area, nature and hiking trails, screened shelters, a snack bar and a bathhouse for swimmers all contribute to the traveler's "at home" feeling at Meridian.

At Lake Whitney State Recreation Park, the scenic surroundings — quiet coves, swift-flowing creeks and towering limestone cliffs — would make angling a pleasure even if the fish weren't in the mood to bite. But bite they do, and in tremendous numbers. Most noted for its "barn-door" crappie, Lake Whitney also harbors lunker largemouth bass, white bass and various species of catfish, some in the 70-pound range. The lake level was raised in 1968, flooding additional brush areas which provide an extremely favorable habitat for fish. Panfish are frequently the main course at meals in the attractive picnic and camp sites near the shore. In spring



TEXAS LAKES TRAIL

The Lakes Trail can be an outdoor classroom in nature, a water sports arena or a quiet place.



The nature trail at Meridian State Park



Benham S

the park is blanketed with Texas' state flower, the bluebonnet, and other colorful wild flower displays.

Lake Whitney is truly a vacationer's paradise. In addition to the State park, scores of smaller parks dot its shoreline. There are sumptuous lodges and motels available and even heated and air conditioned fishing barges for those who want the comforts of home while engaging in their favorite outdoor sport.

Fishing lakes, of course, are plentiful all along the Lakes Trail, more than 20 of substantial size, and each has its own group of faithful devotees who return annually to wet a hook in its waters. Lake Grapevine is among the more popular crappie lakes in North Texas, but those who fish at Lake Tawakoni or Cedar Creek Reservoir would debate the point long and loud. Tawakoni was originally stocked with bass and crappie, but the latter have undergone an astonishing increase and are pulled out by the thousands. Both Tawakoni and Lake Texoma are considered fine lakes for night fishing, but fishing is not the only sport at Tawakoni. Areas are zoned for skiing, and swimming and pleasure boating are also popular.

Cedar Creek Reservoir, covering a hefty 33,750 acres of the East Texas post oak and pine belt, is noted for its wealth of crappie and white bass as well as black bass. Numerous public and private facilities shore-side afford everything needed in the way of boat services, fishing supplies and food, and there are ample camp and picnic areas.

The great metropolitan centers of Dallas and Fort Worth have a large number of recreational,

historical and cultural areas within or near their boundaries. A must for any visitor is the famed amusement park, "Six Flags over Texas," located midway between the two cities. In the Dallas area are several fine fishing and boating lakes: White Rock, Bachman, Mountain Creek and Grapevine. Fort Worth has Lake Worth; an added attraction there is the guided tour of Greer Island Refuge and Nature Center. Other sizeable lakes in the vicinity of Fort Worth include Benbrook Reservoir, Lake Arlington and Eagle Mountain Lake.

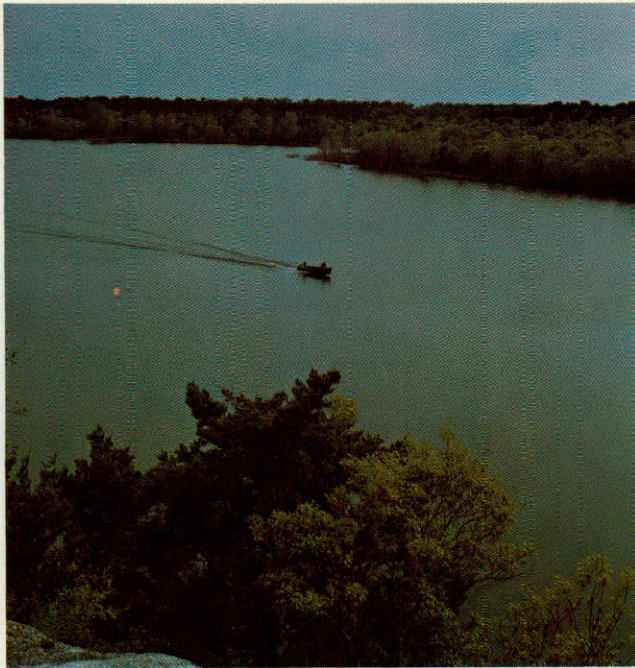
Garza-Little Elm Reservoir is the giant of the northwest section of the Lakes Trail, covering 23,280 acres. More than 20 recreation parks and public-use areas, scores of boat ramps, grocery and fishing supply stores, and camping, picnic and trailer sites are scattered along its 183-mile shoreline.

The State maintains fish hatcheries at Eagle Mountain Lake and Garza-Little Elm Reservoir, and the public is invited to tour these stations. Scientific experimentation and its practical application in the breeding and rearing of fish are continuously carried out in these hatcheries. This information is used to provide Texas with more prime fishing areas and better and more abundant fish populations.

Anyone foresighted enough to plan a vacation somewhere along the Lakes Trail this summer will return home with a renewed appreciation of nature's bounty in providing him with beautiful scenery, pleasant and relaxing sport, and, chances are, a freezer full of fresh fish. * *



recreation Park



Meridian State Recreation Park



Eisenhower State Recreation Park



The FEED-ALL

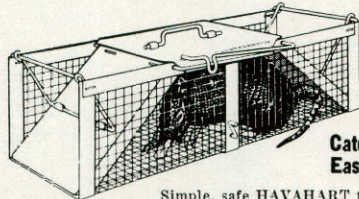
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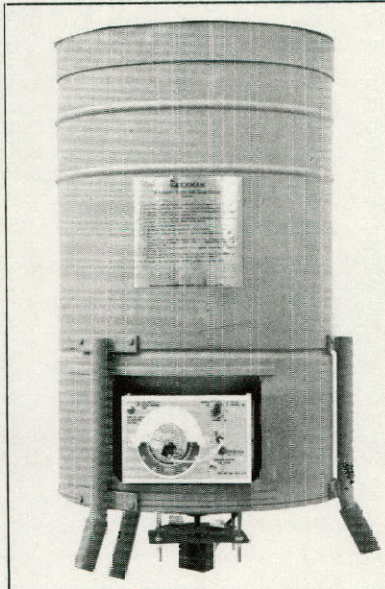


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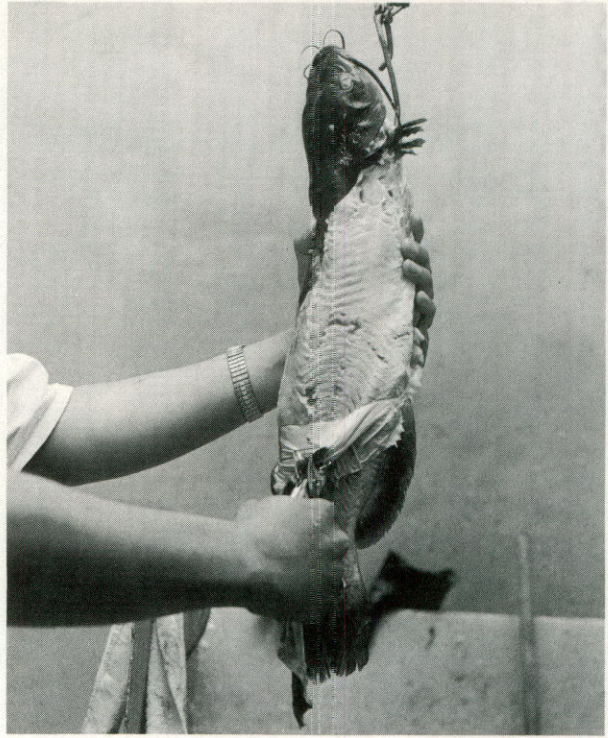
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To Skin A Cat

Photography by Reagan Bradshaw



Many people skin a catfish by hanging it up or nailing it to a board and ripping the skin off with pliers.



The knife is then run between one fillet and the backbone...



But catfish can be skinned like other fish. The fish is headed and the head cut off.



Next the dorsal fin is cut off with one quick slice...



...followed by the pectoral fins using the same hand grip.



and then the other fillet is sliced off of the backbone.



Last the knife is run between the fillet and the skin while holding the tail.



The result is a clean fillet ready for your favorite recipe.

Goose Island State Recreation Park

BAYSIDE RETREAT





Goose Island is often a camp for activities in the area. Many people fish, but some also come to study nature, particularly shorebirds and the old oaks.

by L. D. Nuckles
Information Officer, Rockport

Photography by Reagan Bradshaw

NESTLED among gigantic live oaks, 12 miles north of the resort town of Rockport, lies the only developed State park on the Texas Coast.

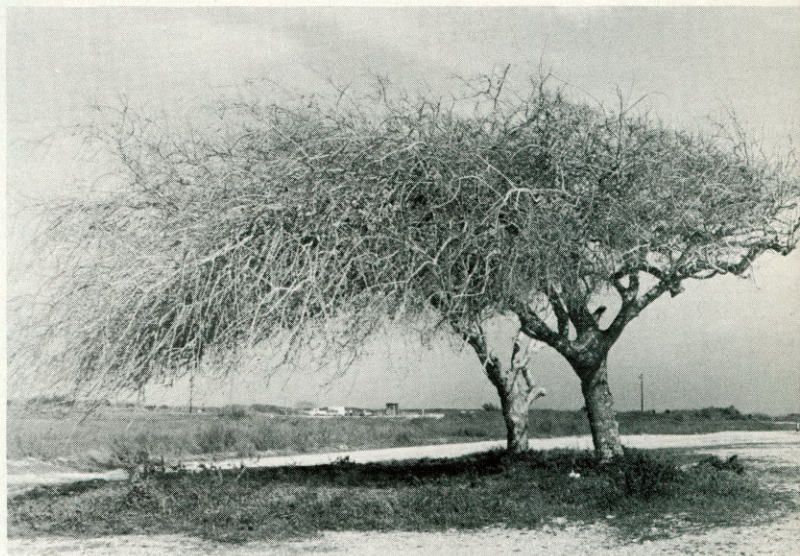
At the junction of Aransas and St. Charles bays, Goose Island State Recreation Park offers a fine vacation spot for the traveler. A wide variety of bird watching is available. Fishing is available in two fine bays. And a little known aspect of Texas history can be studied at close range.

Fishing is one of the main reasons that people go to the park. Sheepshead, trout, drum and redfish run in the bays on both sides of the park. Out on the island, excellent blue crab fishing is available.

The park offers something for nearly every type of fisherman. A pier, 1,650 feet long and lighted to take advantage of the fine night fishing, runs out into the bay. It crosses several islands that are only a foot or two out of the water at high tide, and the shallow fishing on the islands is good. A boat ramp allows easy access into the bay, and a fish cleaning table is in the park.

Less than two miles from this park is Copano Bay Causeway State Recreation Park, two fishing piers that formed the bridge across the bay before the completion of a new causeway. Both of these piers are lighted, and fishermen catch heavy strings of fish attracted to the lights.

People who do not fish still have a lot to do in the area. One of the most neglected aspects of Texas history can be studied at close hand — the settlement of the coast from the time of cannibalistic Indians through Spanish ownership to early settlement by Anglo-Americans.



One of the focal points of the history is the "Big Tree." This is a live oak estimated to be 2,000 years old. Some people say it is really three trees grown together, but everyone acknowledges that it is a giant. At a point four feet from the ground, the trunk is more than 32 feet in circumference. It is 80 feet from the ground to the highest branch, and the crown is huge. The average dimension across the top of the tree is over 80 feet, but the tree has been blown by the wind like other trees in the area, and in the direction the winds have blown, the limbs measure over 140 feet from one side to the other.

The area around the park was once the hunting grounds of the Karankawa Indians, a tribe of cannibals. According to legend they gathered under the big, old oak for their ceremonies and used it as a favorite gathering place for Indian councils. When the Spanish came to Texas, the tree got a more pacific reputation. A Catholic bishop set up his headquarters nearby, and the tree came to be called "The Bishop's Tree." There is a small chapel nearby constructed of concrete made of ground up sea shells from the beaches around.

Another legend says that Anglo-Americans used the tree for the kind of summary justice that



BAYSIDE RETREAT

The Big Tree is one of the attractions of the park. It is over 2000 years old. One of the largest live oaks in the world, it has had a varied career as a center of area history.

developing societies used, and the tree was and still is called the hanging tree.

Many naturalists use the park as a headquarters for studying the surrounding areas. The tree is one of the first attractions, but for other people, the weird sculpture of oak trees along the coast is just as fascinating. These trees have been strangely deformed by the high, continuous winds that sweep across the bay.

Perhaps the biggest attraction outside of fishing is the variety of wildlife, especially birds. Many shorebirds congregate in the area and in nearby Aransas National Wildlife Refuge roam animals such as deer, javelina, European boars and turkey. The most famous winter visitor to the Refuge is the whooping crane. People can drive through or climb towers to watch the wildlife, especially the whooping cranes.

The park is located just off State Highway 35 on Park Road 13. Most of the area was acquired in the 1930's by deed, and then the Legislature set aside the small island to be a part of the park. An entrance fee of \$1 is charged, and a camping fee of \$2.50 is charged for an open shelter on the island.

For many years the facilities were not developed to modern standards, but when Hurricane Beulah roared through in 1967 and almost destroyed all the facilities, they were replaced with up-to-date



structures. There are concrete shade shelters, rest-rooms and showers and many campsites with a picnic table, barbecue grill and running water. These new structures are designed to withstand future hurricanes.

Drainage on the mainland is being improved, and the mainland portion of the park is closed to the public. However, it is hoped that by midsummer that portion of the park will be reopened. With these new facilities and its excellent fishing, Goose Island State Park will continue to be one of the most popular State parks on the coast. * *

Your Texas State Parks

	Located Near The Town Of	Camping	Screened Shelters	Group Facility	Trailer Sewer Facilities	Trailer Water and Electricity	Restrooms	Showers	Cabins	Picnicking	Groceries	Fishing	Swimming	Water Skiing	Boat Ramp	Museum and/or Exhibit	Miscellaneous	Historic Structure	
Recreation Parks																			
Abilene	Buffalo Gap	●	●				●	●		●					●			Texas Longhorn Herd	
Atlanta	Queen City	●			●	●	●	●		●		○	○	○	●				
Balmorhea	Toyahvale	●			●	●	●	●	●	●			●						
Big Spring	Big Spring			P			●	●		●									D
Blanco	Blanco	●	●	P	●	●	●	●		●		○	○						
Bonham	Bonham	●		C			●	●		●			●		●				
Buescher	Smithville	●	●	H			●	●		●		○	○						D
Cleburne	Cleburne	●		C		●	●	●		●		○	●		●				B
Copano Bay	Rockport						●	●		●		●	●		●				
Daingerfield	Daingerfield	●			●	●	●	●	●	●		●	●		●				
Eisenhower	Denison	●	●		●	●	●	●		●		○	○	○	●				B
Falcon	Falcon	●	●		●	●	●	●		●		○	○	○	●			Airstrip	B.T
Ft. Parker	Mexia	●	●	C			●	●		●		●	●	○	●				B
Garner	Concan	●	●	S			●	●	●	●		○	●		○				
Goose Island	Rockport	●	X				●	●		●		○			●				
Huntsville	Huntsville	●		P	●	●	●	●		●		●	●						B.R.T
Inks Lake	Burnet	●	●			●	●	●		●		●	●	○	●				G.B
Kerrville	Kerrville	●	●	S		●	●	●		●		○	○		●				
Lake Brownwood	Brownwood	●	●	S			●	●	●	●		●	●	○	●				
Lake Corpus Christi	Mathis	●	●			●	●	●		●		●	○	○	●				
Lake Whitney	Whitney	●	●	S		●	●	●		●		○	○	○	●			Airstrip	
Lockhart	Lockhart			H	●	●	●	●		●		●	●						G
*Mackenzie	Lubbock	●				●	●	●		●		●	●		●				G
Martin Dies, Jr.	Woodville	●	●		●	●	●	●		●		○	○		●				B
Meridian	Meridian	●	●		●	●	●	●		●		○	●		○			Nature Trail	
Mother Neff	Moody	○					●	●		●		○							
Port Lavaca Causeway	Port Lavaca						●	●		●		●	●		●				
Possum Kingdom	Caddo	●				●	●	●	●	●		○	○	○	●			Texas Longhorn Herd	
Tyler	Tyler	●	●	S	●	●	●	●		●		●	●		●				
Scenic Parks																			
Bastrop	Bastrop	●		C	●	●	●	●	●	●		○	●						G.D
Bentsen-Rio Grande Valley	Mission	●					●	●		●		○							
Brazos Island	Brownsville	○			Undeveloped Gulf Beach					○		○	○						
Caddo Lake	Karnack	●				●	●	●	●	●		○	○	○	●				
Davis Mountains	Ft. Davis	●				●	●	●	●	●									D
Dinosaur Valley	Glen Rose				Facilities being planned—no drinking water—Prehistoric dinosaur footprints in riverbed.														
Longhorn Cavern	Burnet				Daily Cavern Tours					●								Texas Longhorn Herd	
Monahans Sandhills	Monahans	○					●	●		●									
Palmetto	Luling	○					●	●		●		○							
Palo Duro Canyon	Canyon	●			Summer Drama "TEXAS"					●								Texas Longhorn Herd	R.D
Historic Parks																			
Ft. Griffin	Albany	○		P			●	●		●		○						Texas Longhorn Herd	●
Goliad	Goliad	●	●		●	●	●	●		●		○							●
Gov. Hogg Shrine	Quitman						●	●		●									●
Hueco Tanks	El Paso				No drinking water—Indian pictographs														
Indianola	Port Lavaca	○			Open Bay Beach					●		○	○						
Jim Hogg	Rusk						●	●		●									●
Lyndon B. Johnson	Stonewall				Texas Wildlife Exhibit					●								●	
Mission Tejas	Weches	●			●	●	●	●		●		○							●
San Jacinto Battleground	Deer Park				*Battleship Texas					●									
Stephen F. Austin	San Felipe	●	●	S	●	●	●	●		●		○	●						G.T
Vарner-Hogg Plantation	West Columbia				Guided Tours					●									●
Washington-On-The-Brazos	Washington						●	●		●									●
Historic Sites																			
Acton	Granbury				Burial site of Davy Crockett's wife														
*Alamo	San Antonio						●	●											●
Eisenhower Birthplace	Denison						●	●											●
Fannin Battleground	Fannin						●	●		●									●
Ft. Lancaster	Ozona									●									●
Ft. Leaton	Presidio																		●
Ft. McKavett	Ft. McKavett																		●
Ft. Richardson	Jacksboro						●	●											●
Gen. Zaragoza Birthplace	Goliad				Monument Only														
Monument Hill	La Grange						●	●		●									●
Old Ft. Parker	Groesbeck						●	●											●
Port Isabel Lighthouse	Port Isabel																		●
San Jose Mission	San Antonio						●	●											●

Generally available during summer months only

NOTE: Many of the parks listed above are undergoing major developments. Certain facilities and services indicated may be temporarily unavailable. You are urged to inquire directly to the park in advance of your visit.

- * Facilities Not Operated by Texas Parks and Wildlife Department
- Permitted But No Facilities Provided
- Facilities or Services Provided for Activity
- X- Open Shelters
- S- Screened Group Hall
- H- Group Hall
- C- Group Camp
- G- Golf
- P- Group Picnic Shelter
- D- Scenic Drive
- T- Trailer Rentals
- R- Rental Horses
- B- Boats for Rent

Junior Sportsmen

by Patti Swain

NATURE'S system works like a picture puzzle—every piece needs every other piece to make the picture whole. In nature, the puzzle is made of the species that live with each other in the wild.

While it seems that the stronger animals might destroy the weaker ones and leave the puzzle without all of its pieces, nature has developed some efficient and

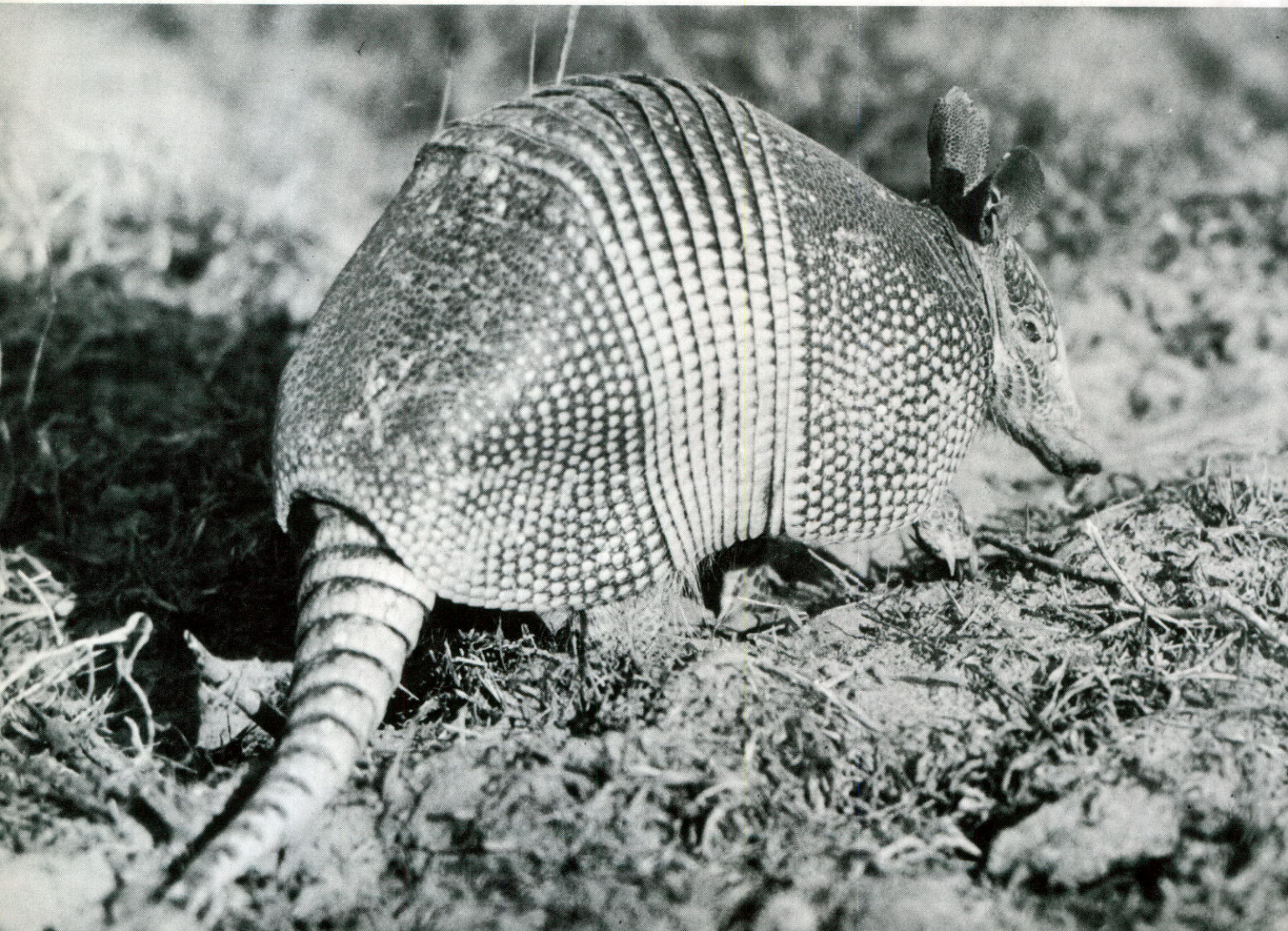
often unusual means of preserving each species so it can keep its place in the puzzle.

Many of these defense mechanisms are designed to keep possible predators at a safe distance. Probably the most famous of these is the skunk's odorous spray. When in danger, the skunk stamps his feet, turns his lifted tail to the enemy and releases a nauseous

spray. The liquid, produced in the musk glands just below the tail, can shower the enemy from 10 to 15 feet away. In addition to its bad smell, the liquid burns the skin and nauseates the victim. A direct spray in the eyes can cause temporary blindness.

The porcupine also has a unique defense system. It is often believed that porcupines can throw their quills like darts at their enemies. This is not true. In reality, the quills are loosely implanted in the skin and can be erected when the porcupine senses danger. Only when the porcupine is actually attacked are the quills left sticking in the attacker.

Another animal with an unusual means of defense is the beaver. It uses its tail for a defense signal as well as for swimming and diving. When an enemy approaches, a beaver uses its broad flat tail to slap loudly on the water. This act of frantic water slapping serves as a danger





A fawn's spots blend in with his background, like the spotted shade of a tree.

signal to other beavers and also confuses and startles the enemy.

Among the marine animals, the squid and octopus exhibit a very unusual means of defense. When trying to escape an enemy, they expel an ink-like substance which forms a liquid smoke screen to conceal them from their predators. This ink cloud frequently assumes a shape somewhat like that of the squid or octopus and acts like a "dummy" to foil the enemy.

One very widespread and familiar means of defense is camouflage — the art of disguise. Many animals survive because their color or shape blends well with the area in which they live. Texas horned toads (actually lizards) are sandy colored and spotted. This makes them hard to see in

the rocky desert they inhabit. Insects such as the praying mantis and some caterpillars often look like the twigs and leaves on which they live. Newborn fawns have spots which break up their colorations and outlines to help hide them.

Probably the best known camouflage artists are the chameleon and the American anole. These lizards can change color as they move to different backgrounds. However, even greater quick-change artists can be found among fish, frogs, crabs and shrimp.

Much like camouflage, and yet still a separate method of defense is imitation. Many harmless animals have the appearances of other animals which are feared or avoided. The scarlet king snake and the Mexican milk snake are

both harmless, yet they are avoided by man because they look like the coral snake whose venom is a deadly toxin. The milk snake's stripes are arranged differently from the coral's in that the red and yellow stripes are separated by black stripes whereas red and yellow are touching on the poisonous coral.

The monarch butterfly contains hydrogen cyanide, which kills predators if taken in large doses, and it advertises this fact with distinctive coloration. The viceroy butterfly is a delicious meal for predators, but it has imitated the colors and habits of the monarch so successfully that it is generally left alone.

Other defenses have been developed to protect the animal in his own particular environment.



This salamander is hard to see because its spots and color are like the leaves around it.



Lizards are protected because they blend in with the colors of things around them.

The pronghorn antelope, for example, has keen eyesight and great speed to protect himself in the great expanses which he inhabits. On his native, wide open plains, the pronghorn can see his enemies long distances away and can escape with speeds of 60 miles an hour.

Slower and smaller animals such as moles, gophers, prairie dogs and armadillos, which cannot outrun their enemies, are equipped with sharp digging claws and often strong snouts which enable them to burrow into the ground and escape their enemies.

Possibly one of the most interesting ways of escaping danger is by feigning death; that is, some animals pretend to be dead in

the face of danger. Of course, the animal which is best known for attempting to trick its enemy by pretending death is the opossum. The opossum is not quite as clever as it may seem however, because its pretending death is actually an automatic response. When alarmed, the opossum goes into a state of shock. In this condition, animals suffer the loss of voluntary motion and their limbs remain fixed in whatever position they are placed.

Shock causes snakes such as the grass and hog-nosed snakes to "sham death." In its death pretense, the snake rolls over, hangs its head back with mouth open and remains completely lifeless. This pretense is exposed

when the snake is put in its normal position and it turns back over and assumes its death pose.

Danger also elicits defensive responses in other animals. Birds, especially young ones, "freeze" when warned of impending danger by their mother. Deer may frequently employ this "freezing" action when they are hidden and it may be safer than running.

Sentries keep watch over herds of grazing animals such as deer, mountain sheep, moose, elk and antelope while grazing. These sentries change periodically allowing each animal time to graze. One wild turkey often stands guard while another dusts itself in a sand hole. Two deer are provided additional protection by lying back



Two deer, standing back to back, can see anything approaching from any direction.

to back, enabling them to see in an entire circle around them.

These methods of defense are actually ways of keeping predators at a distance. Most animals, if cornered, can fight with the more common defenses such as claws, teeth, horns, antlers, tails, hooves, shells, stings and poisons.

Of course, another means of preserving the species is reproduction. The large numbers of eggs laid by fish and reptiles, for example, insure that some of them will grow to adulthood even though some will be destroyed.

With all animals reproducing effectively, nature can maintain an even balance between a species overpopulating and the species being exterminated. **



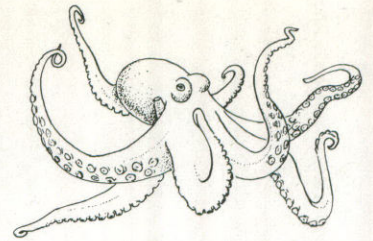
A nutria's teeth protect him, and "eyes" make the moth resemble a larger animal.



The Mexican milk snake, on the right, is not poisonous, but it looks like the coral snake.



Letters to the Editor



River Puzzle

I observed a puzzling phenomenon of nature March 7 of this year. My vision was not playing tricks as I saw the muddy water of the Llano River meet the clear water of the Colorado River at the northwest portion of Lake LBJ. The unusual aspect is that these contrasting waters would not mix. There appeared to be some invisible power forcing segregation as the two rivers met. Eventually, farther down the lake about a half mile the waters integrated.

I am sure there is some explanation for this unusual behavior — although it might not be unusual for “old-timers,” the experience was a first for me. Could you possibly offer some clarification of this phenomenon?

William H. Wheelless, Jr.
Houston

When water from a tributary fails to mix with a reservoir, it can usually be attributed to a natural phenomenon. Most likely, the turbid water of the Llano River was cold rain runoff. The clearer water of the lake was probably warmer. Since cold water is denser and thus heavier than warm water, the two did not “mix” until farther downlake

where there was sufficient heat transfer between the two streams to create like densities.

The same phenomenon applies in cases where cold and murky rainwater enters clear reservoir and, in effect, slides below the warmer surface water to eventually emerge below the dam at the discharge structure.

Siren

I have caught an amphibious animal, and I'm not sure what it is. I am relatively sure that it is a siren of the salamander family. What does he eat, is he warm blooded, does he lose his tail, how long does he live, etc.?

David M. Hembree
Bonham

The siren is indeed a cold-blooded animal as are all amphibians. The siren never loses its gills or tail and never makes a full transition to a land animal. Sirens in the wild generally feed upon small fishes, crayfishes, worms and other aquatic invertebrates. They can be kept for quite long periods of time on a diet of earthworms which they will learn to come and eat out of your hand after

some time. We are not sure how long you could expect this animal to live.

It is surprising that you have captured a siren so far west. They are common in the eastern parts of the state in low swampy ponds, although they are not often seen even in this area. Children in the eastern part of the United States often catch these animals and call them electric eels (which, of course, they are not).

Hunting Seasons

We enjoy *Texas Parks & Wildlife* magazine, but to make it more helpful to us, please publish the hunting dates for deer, dove and quail. We are especially interested in the opening day of deer hunting as we have to arrange our vacation schedules months ahead of the season.

Also, give the information on free hunts on State owned reservations.

L. M. Yeamans
Freeport

We realize the predicament that the manner and time when hunting dates are set causes persons who must plan their vacations; however, these seasons cannot be set until the July meeting of the Parks and Wildlife Commission. This much time is needed by biologists to see how the young of the previous season have fared during the summer months. This insures that populations will not be overharvested and also allows us to recommend longer seasons with higher bag limits in times when the game is abundant. Since each year is different with regard to game abundance, these seasons cannot be set earlier than is presently done.

We plan to publish an article in the October issue of *Texas Parks & Wildlife* magazine telling when and where public hunts will be held on department management areas and how to apply for permits for these hunts.

BACK COVERS

Inside: Sunset does not mean the end of the day on the Texas coast, but most fishermen start back to shore when the sun gets lower. Photo by Reagan Bradshaw.

Outside: Exotics like this black-buck antelope are providing Texas hunters with a wide variety of hunting. Photo by Reagan Bradshaw.

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