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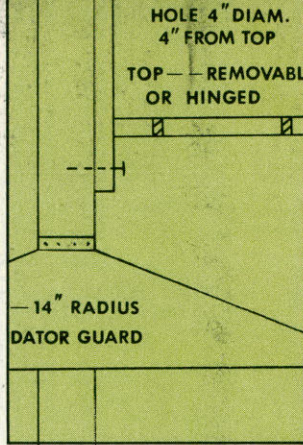
**TEXAS PARKS & WILDLIFE
magazine**

Dedicated to the conservation and enjoyment
of Texas fish, game, parks, waters and all
outdoors.

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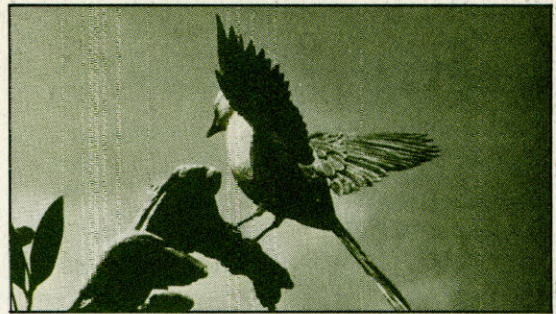
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Cover: A native of Africa, the oryx has been introduced on some ranches in Texas. Photo by Reagan Bradshaw.
Inside: The opossum is the only North American marsupial, an order which includes the kangaroo. Photo by John Dyes.

Housing Project

by Ed Dutch

Department of Agriculture Information
Texas A&M University
and

Larry L. Weishuhn

Department of Veterinary Pathology
Texas A&M University

The American wood duck, *Aix sponsa*, has been severely persecuted by man. Demand for this duck's tasty flesh and beautiful feathers combined with changes in its habitat have threatened this fine bird with extinction.

However, efforts of state conservation departments and interested sportsmen have greatly increased wood duck numbers until they are presently thriving.

Water, food, cover and nesting cavities are essential for the wood duck's survival and reproduction. Clearing of old hollow trees destroys its nesting sites and an important food in the form of mast. Destruction of wood duck nesting areas results from changes in the environment caused by man's desire for intensive utilization of natural resources.

Drainage is directly responsible for the destruction of swamps, sloughs, woodland ponds and marshes. When drainage does not directly affect the habitat, it can alter the replenishment of wetlands following periods of drought. Timber conversion is also the result of drainage since hardwood sites may be converted to pine sites which are of lesser importance as nesting areas for the wood duck. This conversion, as well as drainage, promotes land clearing.

Flood control by the construction of reservoirs and the resulting inundation of floodplain hardwoods reduces the production of mast and decreases available food. Flood control also initiates clearing of remaining trees because the lands are more suited for agriculture since flooding has been partially eliminated.

Intensive forest management in the form of converting hardwood stands to pine woods is detrimental to the wood duck. Cutting of the hardwoods encourages a timber conversion which takes place in a short time. Other management practices performed by the forestry industry, such as using only a high grading program in which only trees useful as lumber are cut, are most beneficial but at times are not economical.

All of these habitat alterations lead to the destruction of nesting sites and available food. Much is being done, especially in the North, to aid the wood duck by improved management practices and a growing concern with conservation and ecology. One practice that can be performed by anyone living around suitable habitat is to construct a nesting box.

The nesting box itself is a structure of either marine plywood, cypress or

cedar that is about 11 inches square, 22 inches high in the front and tapered to 20 inches in the rear for rain runoff. The entrance hole is four or five inches in diameter with strips of roughened wood or wire window screen attached inside the box beneath the entrance, to aid the exit of ducklings. Drainage holes in the bottom and a two- to three-inch layer of sawdust and wood shavings make up the base of the box.

The box is mounted on a pipe or some other support. It is necessary to provide a shield of some sort to prevent predation by raccoons or other animals. A conical sheetmetal guard 36 inches in diameter below the box or a metal guard of two nine-inch-by-36-inch sheets sandwiched around the pipe serve as excellent prevention devices. Predation by most animals is minimized if the box is located over water.

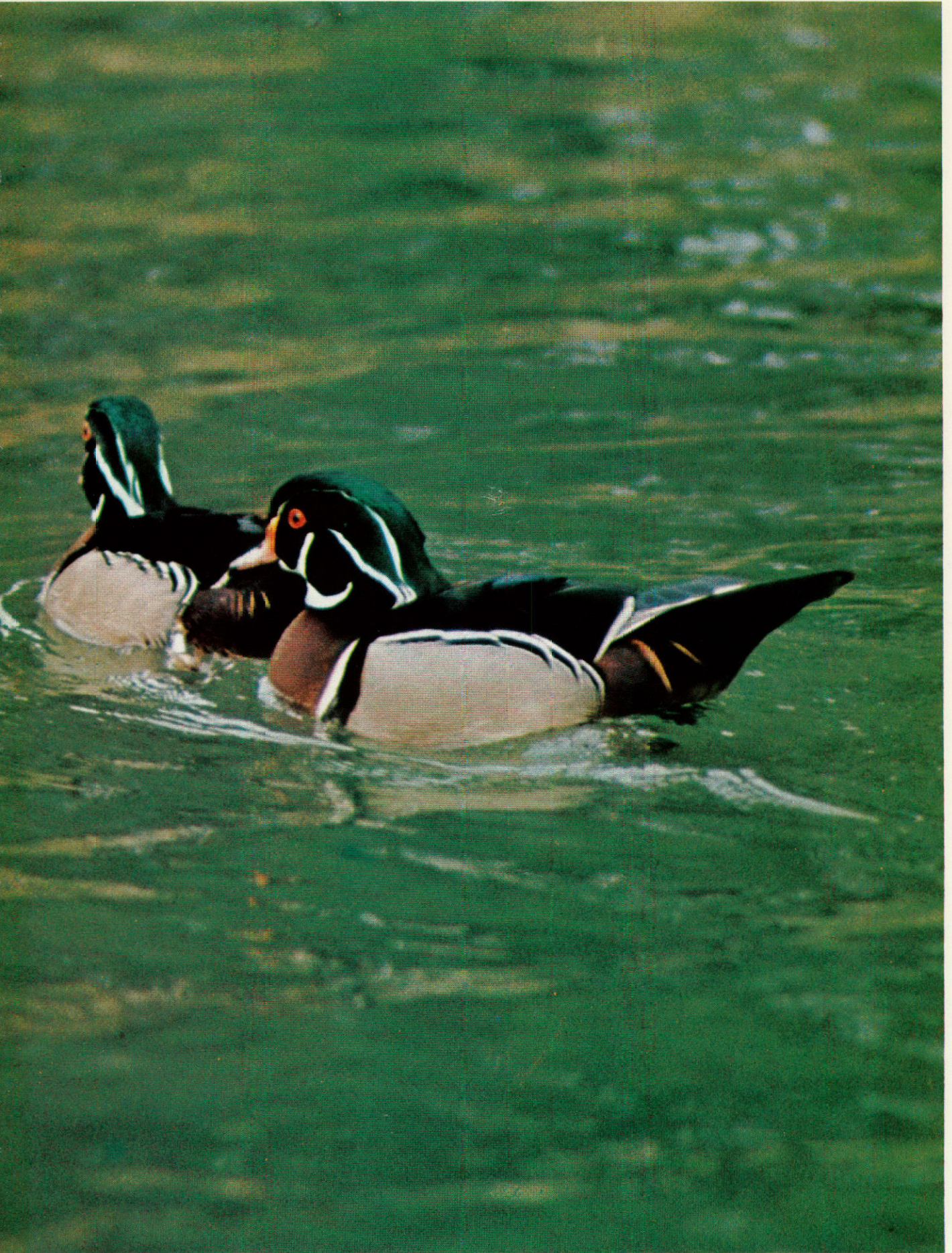
These nesting boxes can substantially increase local breeding populations, but not every program will be successful because factors are variable. The most notable restoration programs have occurred in Illinois, Massachusetts and Vermont. One area of Illinois had only 10 to 15 pairs of wood ducks nesting in a four-mile stretch before the placement of wood duck houses. The breeding population rose and stabilized at 90 to 100 pairs after the artificial nesting boxes were constructed.

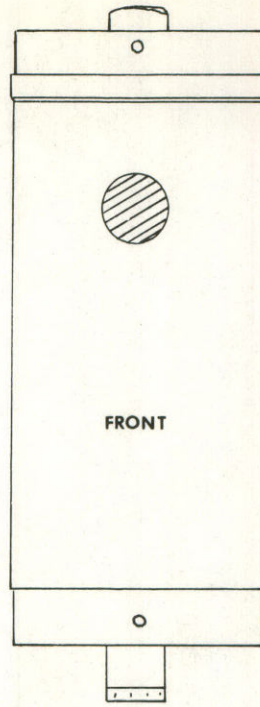
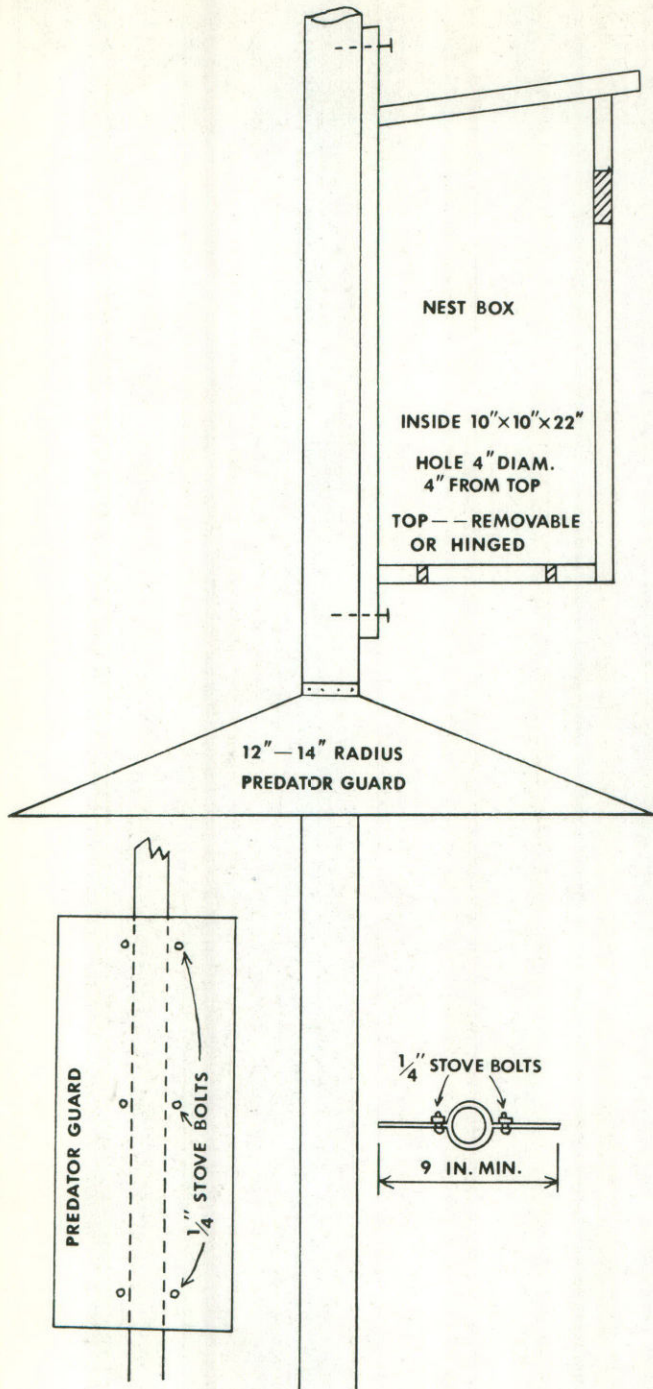
An account of a small project by Texas A&M University Wildlife Science students gives some important facts which are necessary for success. A joint effort between Dr. R. M. Robinson, veterinary pathologist in charge of the Wildlife Disease Program at Texas A&M University, and these students produced a failure the first year. Nest boxes were erected on a six-acre pond in the Post Oak Savanna region of Central East Texas in Brazos County.

During the course of the study, no wood ducks nested in the five boxes which were erected. This failure was attributed to not putting up the nest boxes until mid-February. Most of the wood ducks left the 110-acre study area in the first week of March, 1970. Courtship and nesting activities were well underway before the ducks became accustomed to these nest boxes and the wood ducks actually avoided the nest boxes, probably because of the introduction of new objects to their familiar environment.

In the spring of 1971, the wood ducks had had the previous fall to get accustomed to the nest boxes. Also, the boxes had weathered somewhat. In April one pair of wood ducks nested in a box. The hen laid a clutch of 12 eggs; 28 days







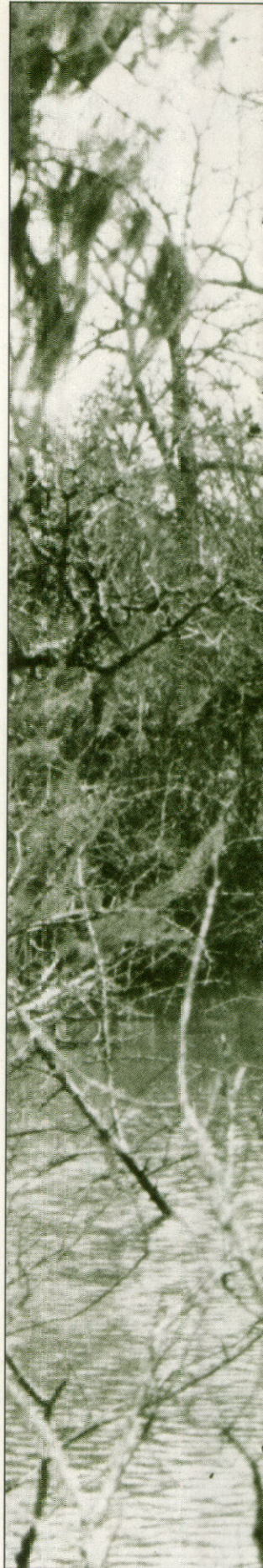
This design will give the birds enough room as well as a sense of security. One side or the top can be hinged so that the box can be cleaned between seasons. A predator guard is essential. The funnel-shaped guard resembles those used on mooring lines of ships. The alternate type shown is made by sandwiching two pieces of sheet metal around the rod supporting the box. On the right, two biologists erect a box over water, the wood duck's favorite habitat; they have not yet attached a predator guard.

later all hatched. By mid-summer the surviving six ducklings left with the hen.

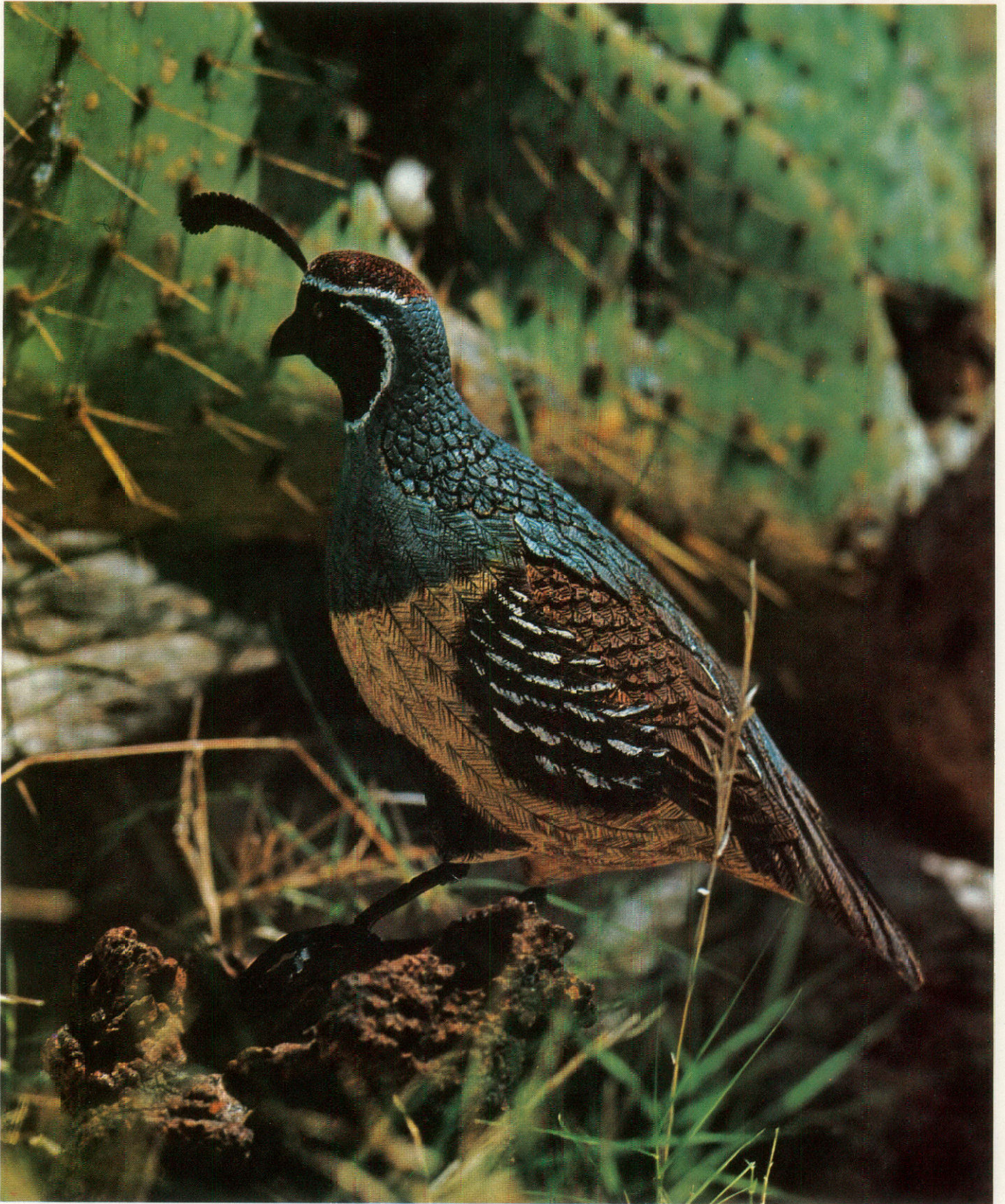
Wood ducks have a habit of returning to nest in the same area each year. This coming spring, barring mortality during the fall, the hen along with some of the young ducks should return to the same pond to nest.

From this trial it can be seen that the erection of the nest boxes must be early enough to allow familiarization by the wood ducks. Other factors of available food and brood habitat combine to make the project successful. It is not necessary to own a swamp before you erect nest boxes. Almost any farm pond that provides some cover and food is suitable. It is thought that at least 30 percent of the farm ponds in the eastern half of Texas are capable of wood duck production. The small pond in the study increased the wood duck population sixfold. Imagine the population increase if landowners, sportsmen and bird watchers erected nest boxes on all suitable ponds.

Wildlife specialists anticipate a continued decline in natural nesting sites for wood ducks. As our various waterfowl become more valuable in the years ahead, management measures will become more intensive. Widespread artificial nesting boxes would be invaluable in maintaining and increasing the population of this particularly colorful species. **







Sculpture by Bill Marks



BIRD SCULPTURE

by David Rideout
Wildlife Biologist

Man has a deep-rooted urge to create things with his hands. An individual who enjoys the beauty of wildlife, one who has hunted birds with gun, camera or with his eyes, can receive a great amount of satisfaction by creating models of birds which he has enjoyed in the woods



A saw, a sharp knife and a little paint are the basic tools for bringing a block of wood to life. But Bill Marks, who has painted covers for this magazine and who carved these birds, says he uses whatever he needs, including a band saw and an electric drill. The knife, he says, must have a handle thick enough to keep your hand from cramping. Marks uses basswood and finishes his carvings with oil paints to make the feathers appear soft and lifelike.

or in his own backyard. The finished carvings will also be beautiful.

Beginning with a small block of white pine, sawing it in the general shape of a particular bird, carving and sanding it to the recognizable form and then painting it to depict the actual bird is relatively simple. The average person, with a little patience, can carve a bird in several nights after supper.

A sharp knife is the basic tool needed for this endeavor. A dull knife must be pushed hard to cut and is more apt to slip and ruin the object being carved, or worse, injure the carver. A coping saw, sandpaper, heavy sewing thread, soft wire (straightened paper clips work fine), needle-nosed pliers, a wood-metal glue, a few paint brushes with fine tips, small jars of paint in assorted colors, some good colored pictures of the birds and a piece of soft white pine to receive all of this attention, finishes up the list of necessary items.

Someone who has not done much carving should probably do a little practicing on a scrap piece of pine first. Learn to control the amount of wood taken off on each cut. It is usually better to take it off in small cuts than to accidentally take off too much; it is hard to replace. The cut is controlled best by holding the knife in one hand, wood in the other and pushing the back of the blade with the thumb of the hand holding the wood.

After studying some good photographs of the bird, draw a side and top view outline pattern on paper. There are many good bird books on the market and in public libraries. Past issues of this magazine can be useful for this also. Professional, colored photographs are usually better references than drawings since the artist's interpretation would be carried over to your work whereas a photograph is impartial. Pictures printed in magazines often do not have the true colors. Of course, there is absolutely no substitute for your own knowledge of the bird.

Being familiar with the bird's movements and actions will help. This knowledge is imparted to the model in the way the head is carried, whether the tail is up or down, or the neck stretched out or pulled in. A good taxidermist uses this familiarity to give his works a lifelike quality.

Transfer the patterns to a block of white pine. A two-inch by two-inch or

two-inch by three-inch block, three to six inches long, is a good size with which to work. Most lumber companies stock white pine in these sizes. Using the coping saw, cut around the outlines drawn on the block. A small vice is useful to steady the block of wood.

Begin carving down the edges, gently rounding off the body and giving shape to the bird. It is usually best to carve small parts such as the neck, head and beak last. These areas are easy to ruin if too much wood is taken off at once, but such errors can sometimes be mended with glue. Refer to the photographs constantly. If fine detail is desired, wing and tail feathers can be delineated with a narrow wood gouge. Sand the entire carving smooth. In some instances, the rough chiplike effect left by the knife may be more desirable and, therefore, require very little sanding.

Eyes are formed by whittling a shallow indentation for the eye socket, sanding it smooth and then putting a drop of glue in the indentation. After the glue dries and contracts, it may be necessary to add another drop.

Legs and feet are made by smoothly wrapping four pieces of soft wire with heavy sewing thread to form the leg, leaving enough wire unwrapped so when the four pieces are spread apart they form the feet. To make webbed feet like a duck's, glue a triangular piece of paper on the bottom of three of the prongs.

Drill or burn holes of the same diameter as the wire legs into the bird's body where the legs should be. This will be determined by the position of the bird when mounted on its perch.

Holes can be burned to receive the legs if a drill is not available. Using a pair of pliers, heat the point of a nail in the flame of the top burner of the stove. When hot, press the nail into the body. A one-half to one-inch hole can be easily burned into the soft pine.

After making sure there will be enough wire leg sticking out after placing it in the holes, cut off the excess length with the pliers, and then glue them in the holes with a good wood-metal glue. Smearing a little glue on the thread will make the feet more rigid.

Now, the fun begins. With the painting, the bird's identity really begins to materialize.

Model airplane paint is a very good

quick-drying waterproof paint for this. It is inexpensive and comes in small bottles in a wide variety of colors. From some basic colors—black, white, red, blue, yellow, green and brown—any hue can be mixed in small amounts as needed. It is a good idea to experiment with colors on a scrap piece of wood to see what mixture will produce a certain color and how it will look.

Do not use a paint that produces an unnatural shiny finish when dry, such as an enamel. Study the photographs or the live bird thoroughly, determine the basic colors and start with them. Paint the larger areas of color first, adding the smaller, detailed areas last. When painting the eyes, remember the iris is one color and the pupil another, often black. It is surprising how much personality is added by a small dot of black in the middle of the colored iris.

By now, you'll realize how much more aware you've become of the bird's shape and colors. As with many things, we often look at even the most common birds all our lives without really "seeing" them.

After the model bird has been painted, it is ready to be mounted on a perch. Take a walk in the woods and find a weathered, gnarled projection on a stump or fallen tree. Saw this off to make a flat base and clamp the toes of the bird around the projection or branch. In some instances the claw portion of the toes can be stuck into the wood with the aid of the needle-nosed pliers. A few spots of clear-drying wood-metal glue may be needed to anchor the bird firmly on its perch. Touch up the plier marks on the toes with paint and it is finished. Ducks and other waterfowl look good without a perch, standing on the shelf or table on their own.

The variations that can be used in carving and painting birds is limited only by the imagination and ingenuity of the individual. A hawk settling on a lofty perch or a teal whistling through the air can be produced by carving the outspread wings separately and gluing them into slots cut in the body of the bird.

Whatever degree of proficiency a person may develop in this craft, it is certain to produce one thing: a deeper awareness and appreciation of the beauty and complexity in wildlife and nature. **



Marks has been interested in wildlife since he lived at a fish hatchery as a child. Now his lifetime of observation helps his birds come to life. He gives one tip: only extended wings like the scissortail's above should be carved separately and glued on; all other parts, including long tails, should be carved as one piece.



OUTDOOR BOOKS

BIRDS OF NORTH AMERICA by Austin L. Rand; Doubleday & Co., Garden City, N.Y., 1971; 255 pages, \$9.95.

This and the following two books are three of a six-volume series on the fauna of North America. *Birds* is a photographic and verbal description of the 600 species of birds which regularly occur in North America.

The volume is introduced with a brief general discussion of birds, their evolution from the Jurassic Period about 150 million years ago, specific adaptations for flying, eggs and habitat. On subsequent pages families of birds are arranged in the sequence of the *Checklist of North American Birds*. Seventy-three families are discussed from pelicans to sparrows.

Birds is a volume to use in the home library. It is too big to fit into a pack and too expensive to haul into the field. Perhaps it is unfair to compare *Birds* with Peterson's *Birds of Texas*, but Rand's book simply does not have enough specific information in it to satisfy me. But then, Peterson covered just one state, and Rand had a whole continent to deal with in 255 pages.

For instance, I would like to know more about the golden-cheeked warbler which nests in the cedars of Central Texas. The fact that it nests in Texas is about the only thing I'm told in Rand's book. There are, however, 51 other species of warblers to discuss in a single chapter.

Rand's book is a good introduction to the birds of North America. It is well written and beautifully illustrated. For all its color photographs though, the volume lacks a bibliography or list of sources which the reader could consult if he is interested in a particular species in his area.

Austin Rand was chief curator of zoology at the Field Museum of Natural History. He has been associated with the American Museum of Natural History, made several ornithological expeditions, and written several books on the subject of birds.—David Baxter

INSECTS OF NORTH AMERICA by Alexander and Elsie Klots; Doubleday & Co., Garden City, N.Y., 1971; 250 pages, \$9.95.

I went to see the movie "The Hellstrom Chronicle" recently. It was scary.

The point the movie made was that only two forms of life are proliferating on earth—man and insects. There are more species of insects than all other animals and plants combined. And of the 703,500 known species of insects, more than 86,000 are found in North America.

The introduction to *Insects* makes many

points which were made in "Chronicle." Insects have a jump on birds and mammals in their evolutionary development and have been around for more than 300 million years. With all these years of experience, insects have adapted and flourished in nearly every environment.

The reproductive powers of insects are so great that if all the offspring of a single fruit fly, *Drosophila*, were to survive to reproduce, there would be 25 generations of flies by the end of the year. The 25th generation would be so large that all the flies packed 1,000 to a cubic inch would make a ball of flies 96 million miles in diameter.

Of course, not all of the offspring of insects will survive because natural parasites and predators will thin the numbers, but man is doing a good job of destroying reptiles, birds and other insectivorous creatures with the very poisons designed to assist him against insects. The "Chronicle" brought out that insects are quick to develop an immunity to DDT and other poisons. In fact, the only creature not adversely affected by atomic radiation is the insect. *Insects* is generally organized in its discussion according to orders of insects. The text is a discussion of groups of insects, not an identification manual like the Peterson guidebook to insects reviewed in the July 1971 issue of *Texas Parks & Wildlife*. The authors concern themselves with the food, structure and habitat of the various life stages and the impact each stage has on other life.

The closeup shots of insects are dramatic and well reproduced in the book. The volume lacks a list of references that an interested reader could consult if he wanted more information on a specific insect. The authors, a husband and wife team, have published several books on entomology. "The Hellstrom Chronicle" closes with the disconcerting and heretical thought that perhaps insects are the chosen species on earth and that they will be around long after we destroy ourselves.

After the movie, my wife made the comment, "But bugs aren't nice." That's right, they are not loaded down with such concepts as nice; all they do is survive. Pick up a copy of *Insects of North America* and take a good look at the meek which will inherit the earth.—David Baxter

MAMMALS OF NORTH AMERICA by Robert T. Orr; Doubleday & Co., Garden City, N.Y.; 250 pages, \$9.95.

Mammals are supposed to be on the top of the evolutionary scale of modern life on earth. As I said in the previous review, I'm not so sure anymore.

Mammals are believed to have evolved from mammal-like reptiles. Higher metabolic rates have enabled mammals to maintain a higher body temperature and helped them survive in a variety of climates.

Orr builds his discussion of mammals around the evolution of the various species and ways the animal has been modified by its environment to cope with its surroundings. Let's take the familiar armadillos for instance.

The armadillo is South American by origin and came to North America only after the Isthmus of Panama rose above water during the Pleistocene. It is related to the giant Pleistocene ground sloths with their huge turtlelike carapaces.

The armadillo's nose is sensitive for finding the grubs and insects which its sharp claws dig up. The animal's northward movement has been limited by the relative lack of body hair. Without a thick covering of hair like such typical northern mammals as wolves, the armadillo cannot maintain a constant body temperature when the weather turns cold.

Like the other two books in the series, *Mammals* is not intended to be removed from the library nor is it an identification manual. The series is an intermediate source between field guides and more complete or more technical works. The three books of the series are successful in bridging the gap between the two sources.

Mammals are not as colorful as gaudy insects or brightly plumed birds. Consequently, illustrations in *Mammals* are not as striking as those of the other two volumes. It is just as well written as *Birds* and *Insects* and functions better as an intermediate source since the author takes the time to compile a bibliography of both field guides and technical journals. Orr taught biology for 22 years at the University of San Francisco and is chairman of the Department of Birds and Mammals of the California Academy of Sciences.

Other books in the Doubleday series are on North American fishes, reptiles and amphibians and invertebrates.—David Baxter

NATURE STRIKES BACK by John Gabriel Navarra; Natural History Press, Garden City, N.Y., 1971; 224 pages, \$5.95.

Residents of Lubbock know what it's like to have a tornado rip through the town. The people of Corpus Christi have seen a few hurricanes in their time, and just about every Texan has experienced either a drought, winter storm, flood or thunderstorm.

Modern Texas has been plagued with every natural disaster listed in Navarra's book except earthquakes and volcanoes.

Navarra and his wife traveled around the world looking for disasters. His wife took the photographs, and he made notes. He discusses each type of natural holocaust, the historical aspects of the event and some of the scientific causes of it. After most of the chapters he includes a thumbnail sketch of what to do during a disaster to stay alive

and remain as safe and as comfortable as possible.

The amazing thing about natural disasters is that humanity seldom learns from the catastrophe. San Francisco was almost completely destroyed in 1906, but the entire peninsula has been rebuilt including several multistory office buildings downtown. Some of the vital structures in the Bay Area such as hospitals and schools have been built directly on top of the San Andreas Fault. San Francisco's water supply comes from a lake formed by the fault. What will the city do for water if the fault shifts around someday?

San Jose, California, is condemning some of their public school buildings because they do not meet standards which supposedly will withstand an earthquake. It is not because the buildings are so old that they will not stand up; some of them are modern but simply are not designed to handle a shock in the first place.

Padre Island across from Corpus Christi is being developed with high-rise condominiums only a couple of hundred yards from the surf. This seems to be tempting God's wrath since it's only a matter of time before another hurricane comes roaring through.
—David Baxter

ECOLOGY, THE STUDY OF ENVIRONMENT by Harold E. Schlichting, Jr. and Mary Southworth Schlichting; Steck-Vaughn Co., Austin, 1971; 48 pages, \$2.95.

What does ecology mean? What is pollution, an ecosystem and conservation? These are a few of the terms which crop up in the homework of today's children.

Ecology attempts to explain these concepts. The volume is part of the publisher's Wings Books which are designed for students of the middle grades. The books are for both average and below average readers.

Ecology is explained as the study of the places where plants and animals live and why they live there. The concept is illustrated in what the authors call "webs of life." For example, the relation of the individual deer and the total deer population and the effects of both on the plant and animal community are interdependent. When an individual changes, a population changes. When the population changes, the community is affected.

The community, or biome, concept is well-illustrated with a simple practical exercise which can be carried out at home. Biomes of mosses and lichens are made and studied over a period of weeks.

For the most part, the concepts should be clear to the reader and are well-illustrated with black and white sketches. Only a few of the terms will stump a kid and send him to his parents for explanation.—David Baxter

LONG SHOTS SHORT CASTS

Candles for Campers: Anyone who spends any time at all camping should remember to put a few inexpensive emergency candles in their backpack or storage area. These little items can be extremely important as sources of light, as firestarters, as a waterproofing agent or as a lubricant. A candle will supply enough heat to raise the temperature in a pup tent to a comfortable level. Matches with a coating of paraffin are water-resistant. Boot-seams coated with wax keep out moisture and cold. A light coating of wax acts as a long-lasting lubricant on zippers or for protection against chapped skin.

Too Adapted: Whales are so adapted for ocean life that the skeleton cannot support the body on land. Whales soon die when stranded on a beach because their weight restricts their breathing.

Short Life-span: All bumblebees except the queen bee die during the winter. She alone survives to produce another generation.

Paid Back: A report from Pennsylvania tells of the trapper who found a dog in one of his traps. Very gently the trapper released the animal from the trap. The dog sat down, licked his sore paw for a couple of minutes, and then jumped up, bit the trapper and ran into the woods.

Sportsmen Pay: The nation's hunters and fishermen provided nearly \$250 million for fish and wildlife restoration in 1970 through their license fees and taxes paid on their sporting equipment.

Misinformation: Contrary to what many ranchers believe, it is extremely rare for a golden eagle to kill a lamb, and when it does occur the lamb is usually sickly. An eagle can barely lift six pounds, and tales of eagles carrying off sheep and lambs are wrong. The eagle's favorite food is the rabbit—a grass-eater that competes with sheep for food and is a nuisance for ranchers.

Pupfish Protection: The future of a rare and endangered minnow—the Monkey Springs pupfish—now seems reasonably secure thanks to the efforts of the Arizona Game and Fish Department's Fisheries Division and the Arizona State University Department of Zoology. The pupfish is found in only one small spring in the extreme southern part of Arizona and it was almost exterminated when some unknown person released largemouth bass into their spring. The bass quickly ate most of the pupfish and when Monkey Springs was checked last February only one pair of pupfish could be found. Fortunately the Game and Fish Department had collected a few specimens earlier and had taken them to Arizona State University where they had been successfully reared. Now there are about 100 of these rare fish.

**YOU'RE THE SOLUTION
TO WATER POLLUTION**

by Phil D. Goodrum
Bureau of Sport Fisheries and Wildlife

**Modern tree farming
threatens an important
wildlife food.**

ACORNS FOR WILDLIFE

A hardwood forest, like the one on page 13, has variety, a thick understory, good seed production and a varied wildlife. By contrast a pure stand of pine, shown on this page, produces few seeds that wildlife can eat, and few animals will be found here. Hardwoods and wildlife also lose when bottomlands are flooded behind dams, the results of which are shown at the top of page 13.





Neal Cook

vegetation, leaving little in the way of acorns and other nuts or forage plants for game food. A few birds like the pine warbler and chuck-will's-widow nest in pine stands, but they forage for insects during the nesting period outside the pine stand.

For more than 50 years most of our mixed pine and hardwood forests in East Texas have been subjected to a continuous removal of oaks, gums, hickories, red mulberry, and other hardwoods for home use, sale or timberstand improvement for pine. The best pines have also been cut. As a result not many of the larger trees, the best food producers, are now present. Some of our choice hardwood bottom habitats have been flooded to create lakes, some of them huge, like Sam Rayburn and Toledo Bend reservoirs. This is a serious loss of habitat.

In recent years, the trend in forest

management in East Texas is clearing forest land and planting to pine. In the forestry profession this is known as even-age management because all trees in a planted area are the same age. Under this system of management the planted pine get a head start on the hardwoods, resulting in poor quality of any hardwoods that may start growth.

The objective of most even-age management is to produce pine on a short rotation basis—that is, the trees are harvested when they are about 20 to 30 years of age. When harvesting is completed on an area, the site is then prepared for planting again. This, and subsequent preparations, which involve bulldozing and plowing, drastically reduces rootstocks of hardwoods that were there during the first rotation.

All of this has left us a comparatively poor game and wildlife environment. To make matters worse, the change in land use since World War II, from general farming to planting old fields to pine and to the establishment of improved pastures for cattle, has done much harm to bobwhite quail and mourning dove habitat. These birds have had no choice but to take to the woods and town sites where food and feeding conditions are better. Quail hunting today in East Texas is a woods operation and difficult. Acorn production within the forest provides quail with one of its most important foods. Year in and year out 15 percent of the total annual volume of food eaten by quail is acorns. From October to February about 30 percent of all food is acorns. In some years this higher percentage will continue until April. Can quail swallow acorns? Yes, they can swallow the smaller ones like willow oak, and they can break the larger ones into smaller pieces before eating.

What about other kinds of wildlife besides quail? According to experts who have studied the situation, a total of 186 birds and mam-

Every hunter knows that oak trees and acorns are an important part of any wildlife habitat. This is not to say that pine mast is not utilized by wildlife. Fact is, pine seeds are a valuable and nutritious wildlife food.

The problem is that not many seeds are produced in a pure stand of pine. The trees are simply too close together for good seed yields. Too, a pure and dense stand of pine greatly reduces the growth of other



mals including deer, turkey and squirrels consume acorns and other oak products such as buds and leaves. This places the oaks as number one on the plant food list for wildlife.

Most oaks will not produce acorns until they reach about 20 years of age. From this point on seed yields increase with age and size of the trees. However, an oak tree in a dense stand will not produce as many acorns as one that has more growing room for crown development. Even in good crop years not more than one tree out of three will produce a good crop of seed. Furthermore, good crop years occur about every third year.

There are two groups of oaks in respect to seed production—the white oaks which produce acorns in one year and the black oak group which requires two seasons to produce seed. In the white oak group are white oak, cow oak, post oak, overcup and live oaks. In the black oak group are red oak, sandjack, blackjack, willow oak and water oak. A forest stand that contains several species of both groups has a much better chance of producing acorns every year than one containing those of only one group, because weather conditions may be favorable for seed formation for one of the groups in a given year and not the other.

Nutritionally acorns are a highly desirable food for wildlife. They are high-energy foods, containing ample fat and carbohydrates also protein, vitamins, calcium and phosphorus. They are available in fall and winter and sometimes for the whole year, when protected by wet litter or soil. Squirrels, turkey and deer may dig them up and eat them every month of the year.

The high energy content helps wildlife become fat for the winter period, thus putting them in good shape for the breeding season and boosting the number of young born beyond the average.

Assuming that acorns constitute about one-half of the diet of deer and quail and about three-fourths of the diet of squirrels and turkey for the 180-day period beginning when acorns start to fall, it would

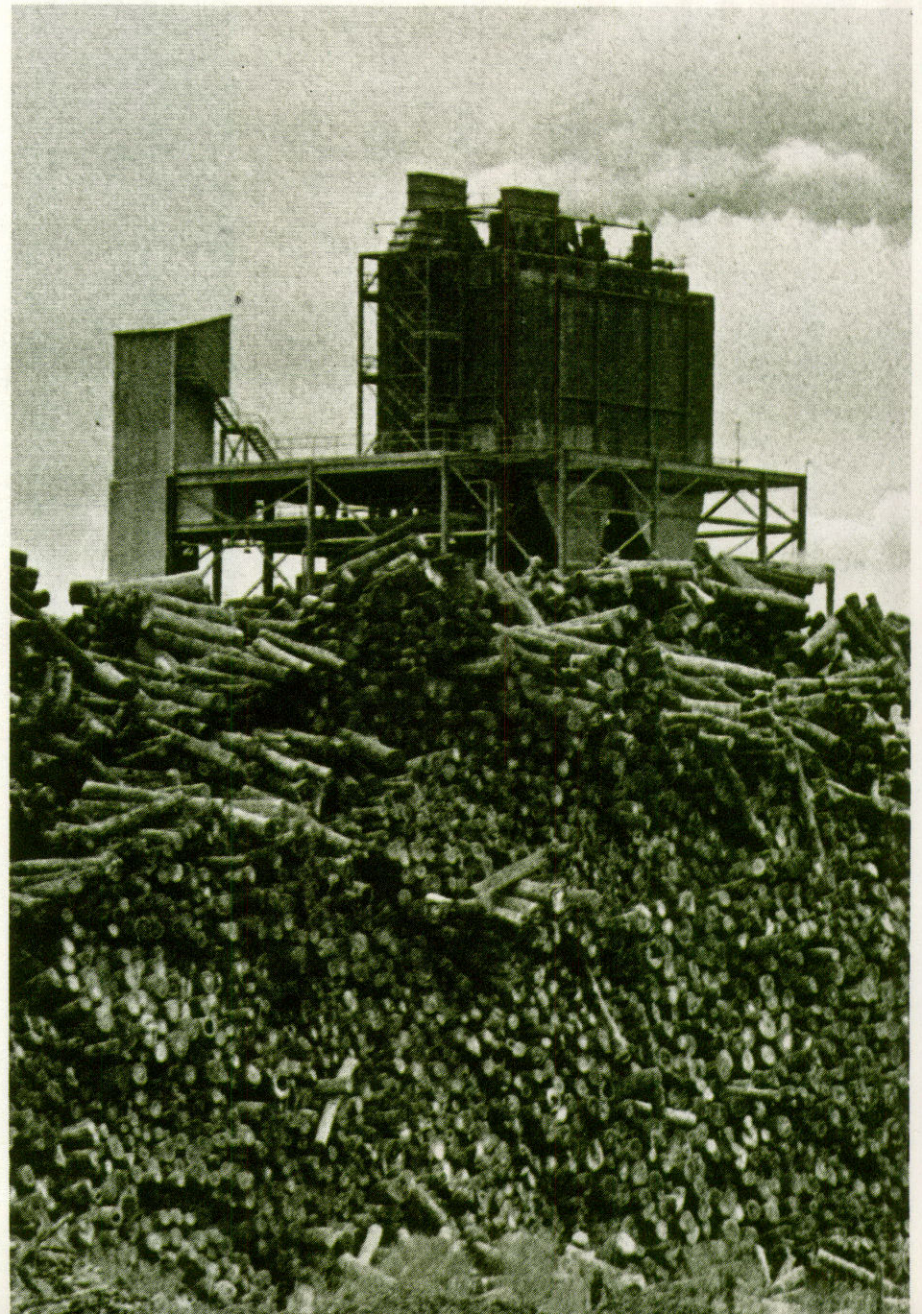
require about 51 pounds of acorns per acre for this period. The number, kind and size of oak trees necessary to approximate such requirements varies a great deal. For example, assuming that we have an average crop year, it would require five blackjacks 10 inches in diameter, five sandjacks 10 inches in diameter, five post oaks 14 inches in diameter, and two water oaks 16 inches in diameter on each acre to produce 68 pounds of acorns.

Considering the condition our forests are in today, it is hard to find a single acre with this many trees of this size and variety. Instead of removing oaks from our woods, we need to have more to meet the minimum requirements of wildlife. Until we do this, wildlife will suffer. **

Ugly scars like the one shown below, which are subject to soil erosion, are being bulldozed across Texas in the name of efficient tree farming. The object is to grow pines all the same age which can be harvested at the same time. Much of the pine goes to pulp mills such as the one at the bottom.



Photographs by Reagan Bradshaw



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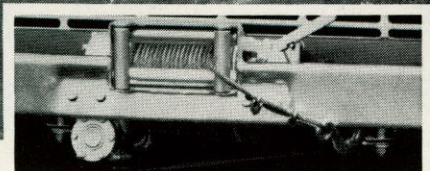
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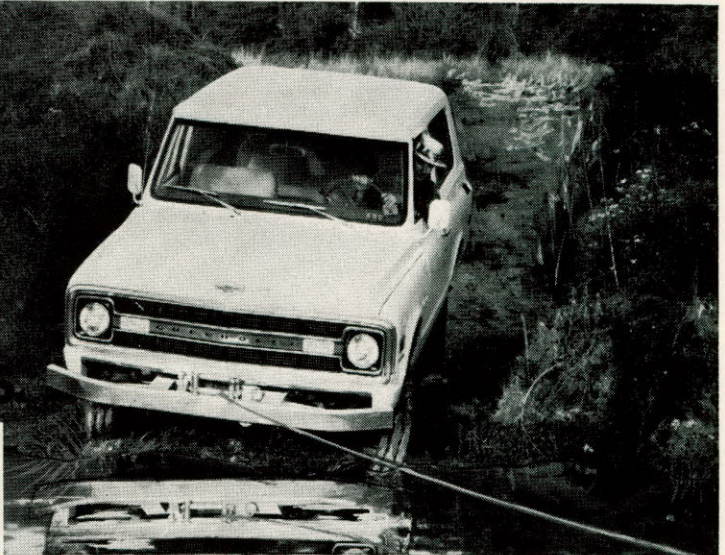


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HUECO TANKS STATE PARK

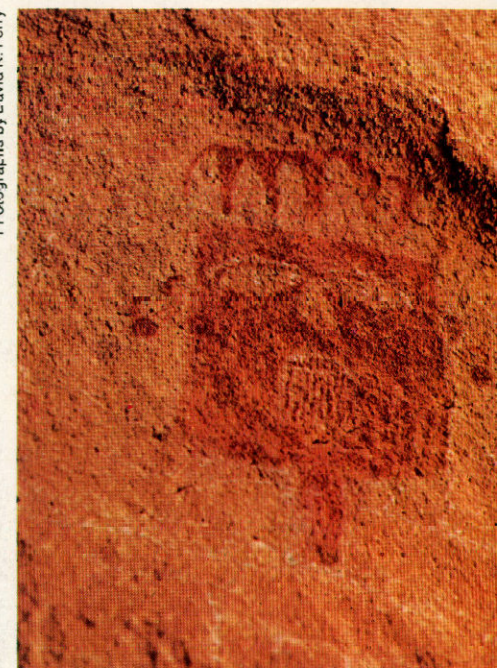
Huge rock formations tower more than 400 feet above the visitor to Hueco Tanks. The state's westernmost park is comprised mostly of a granitelike rock called syenite. The weather of several million years has formed holes and depressions in the formation known as huecos, the Spanish term for hollow places or holes. The huecos captured rainwater and made the place a favorite stopover for Indians and white pioneers. Campers for a thousand years have left paintings on the caves and overhangs in the area.

State parks are classified by the Texas Parks and Wildlife Department as recreational, scenic or historic, but one of the state's newest and most exciting parks is a unique combination of all three. Designated as a historic park, Hueco Tanks State park is also rich in scenery and recreational opportunities.

Located about 22 miles northeast of El Paso, Hueco Tanks is accessible by U.S. Highway 62-180 and Ranch Road 2775. This 860-acre oasis has the distinction of being Texas' westernmost state park. Also within easy driving distance from the park are the Guadalupe Mountains National Park, White Sands National Monument and Carlsbad Caverns.



Photographs by David K. Ferry



Article by David K. Ferry
Park Superintendent



Greeting the visitor as he enters Hueco Tanks are huge boulderlike rock formations which tower over 400 feet above the surrounding desert at some places and comprise most of the park area. According to geologists, these massive rock formations were created between 30 and 35 million years ago as a result of an intrusion of molten rock into ancient limestone formations. The intrusion never reached the surface to become a volcano, but instead cooled far underground, forming a granitelike rock known as syenite. As time passed, the limestone above the intrusion was eroded away leaving the syenite jutting up as it does now.

After several million years of exposure to wind, water and freezing temperatures, the intrusion became cracked, broken and pockmarked. These pockmarks have eroded to form holes and depressions in the rocks, giving rise to the Spanish term *hueco* (pronounced WEH-co), which means a hollow place or hole. The *huecos* range in size from a few inches to over 20 feet in diameter with depths of greater than 10 feet in some of the larger ones.

Not only did the *huecos* give the

park its name, but they also act as natural cisterns, collecting priceless rainwater and making the area a favorite camping place for Indians, a stop on a famous stage line and a watering place for pioneers and travelers headed west. After millions of years of preparation by nature, Hueco Tanks has become an enchanting state park where many people with diverse interests can find their own type of enjoyment and relaxation.

For the historian, there are the ruins of a way station of the Butterfield Overland Mail Line, which ran from St. Louis to San Francisco between 1858 and 1861. The Butterfield Trail passed through the park, taking advantage of the ever-present water supply and the shelter afforded by the caves and rocks. Many of the early travelers on the Butterfield Trail left a record of their stay at Hueco Tanks by carving or painting their names and the date of their visit on the walls of the caves and shelters where they camped. The earliest of these was W. C. Agurs, who camped in Comanche Cave during 1849.

Those interested in archaeology can spend hours searching the park for pictographs left by Indians

who frequented the area. There are approximately 25 general locations within the park where the pictographs have survived the ruthless action of wind and water and the vandalism of thoughtless individuals armed with spray paint.

It is thought that at least two tribes were responsible for the majority of the paintings. The historic paintings, which usually depict action and include representations of white men, are attributed to the Mescalero Apaches. The older, more symbolic pictographs were probably the work of a prehistoric Pueblo people.

The abundant water supply at Hueco Tanks makes the park a naturalist's paradise. Deer, rock and ground squirrels, chipmunks, jackrabbits and cottontails, coyotes,

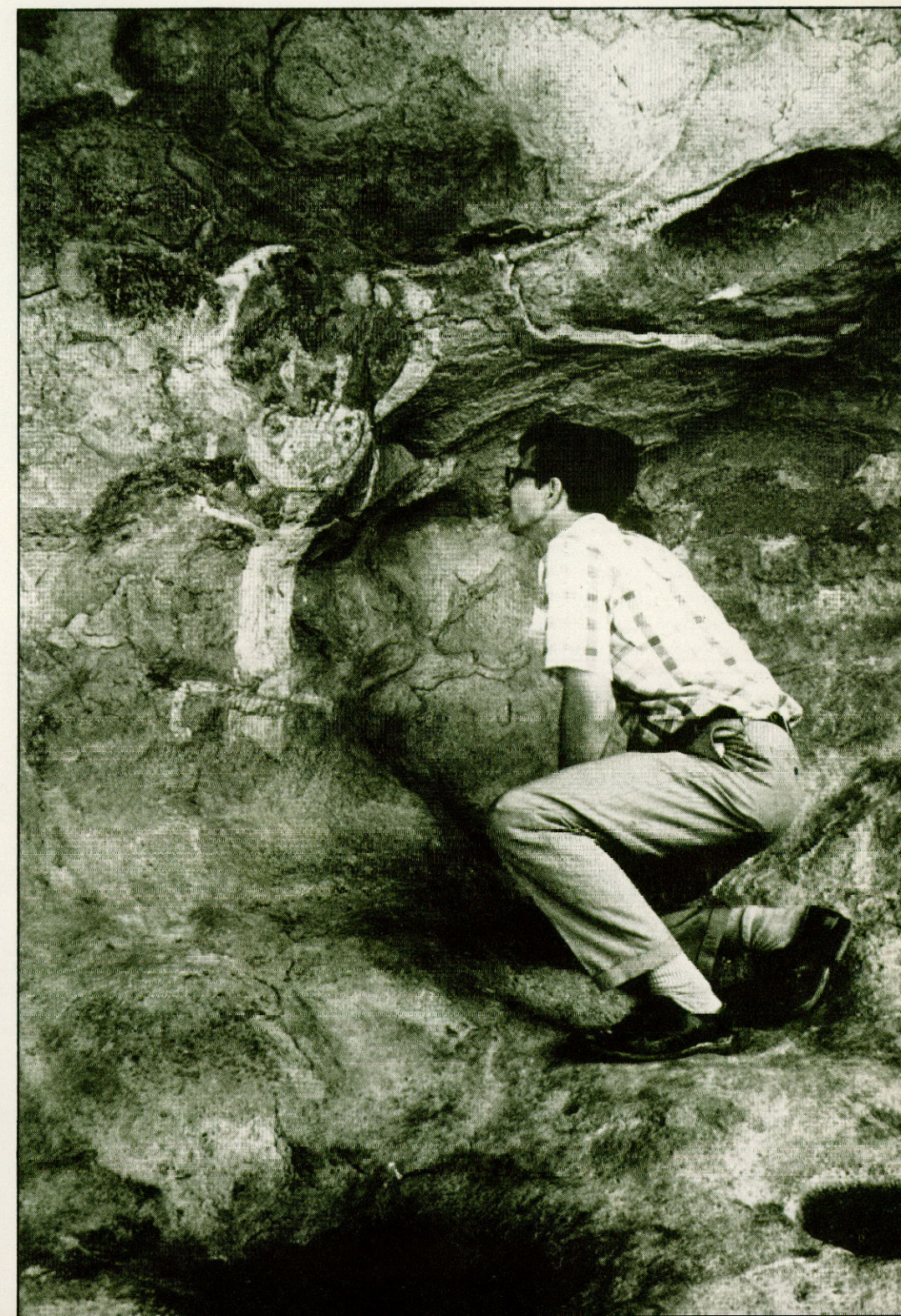
skunks, badgers, porcupines, bobcats and a mountain lion have been sighted within the park boundaries. Also, there are many varieties of snakes, lizards, insects, frogs and even salamanders. Awaiting the bird watcher are uncounted species of birds ranging from hawks to hummingbirds. The botanist will encounter a wide variety of desert plants as well as trees like the evergreen juniper or the one lonely cottonwood that has flourished near a small lake.

Hueco Tanks would probably be classified as a scenic park if its historic qualities weren't so outstanding. A 400-foot sheer cliff, a natural bridge, two small lakes and many hidden valleys are only a few of the park's scenic attractions. The highest peaks in the area offer splendid views of the mountains and desert which surround the park, while the strangely weathered rocks make interesting subjects for the camera bug.

The recreational possibilities of Hueco Tanks State Park are just beginning to be realized. Scheduled for the near future is the construction of overnight camping facilities, restrooms, a headquarters building, picnic areas and an interpretive center near the site of the Butterfield Overland Stage Stop. Completion of these facilities will provide far West Texas residents and tourists with a much-needed recreational area which offers something to interest almost everyone. * *

The rocks of Hueco Tanks have sheltered many travelers. There are more than 2,000 pictographs in the area. Some of the pictures show hunting scenes, and more symbolic scenes are attributed to prehistoric tribes. Not even modern graffiti have obliterated the art, and it will be protected in the future. The pictograph being examined below is the figure of a scorpion with the head of a woman.

Photographs by Reagan Bradshaw





THE

by W. R. Long
Information Officer, San Angelo

Photography by
Kar Maslowski

AMERICAN



King Henry VIII offered a bounty on crows, and these greedy, troublesome black creatures are still the nightmare of grain farmers in some areas.

The common or American crow, *Corvus brachyrhynchos*, is found throughout most of the world. It is so widespread that some people say flyways in the United States are bordered on the east by the Atlantic and the west by the Pacific. This much-maligned robber is perhaps the most raucous of a family which includes such notorious members as jays, ravens and magpies.

Male and female birds both have black beaks, feathers, legs, feet and claws, and the eyes are blackish brown. Body plumage is normally glossy iridescent, but albinism occurs frequently.

Broad, pointed wings are as feathery as a forest of fern and much longer than the tail. Many outdoorsmen, handling the seemingly heavy bodies, have remarked about the number of feathers on the bird. As large as they appear, most adult crows are less than two feet long and weigh only about one pound. Southern and western types are generally smaller than the heavier eastern cousin.

CROW

The extremely well-developed vocal muscles can produce many varieties of sounds. Ornithologists have taped feeding calls, alert calls, mating sounds and a harsh warning cry.

The fear of man's pressure is not inherited from parent birds because young crows become gentle immediately. Taken from the nest just a week or so after hatching, young birds have a heart-warming way of taking up with their human captors and becoming household pets. In proven cases, the fledglings adopt the human as a parent, beg food from the table and show no concern or interest for other crows which may be nearby.

An ancient belief states that crows learn human language and speak it easily if they are caught young, their tongues split and words taught by repetition. The custom is not only partially false but inhumane. In truth, young birds learn quickly and readily speak many words of one or two syllables. Tongue-splitting may actually hinder more than help.

The life span of the common crow varies with habitat and captivity. The tedious work of making a living on grains, plants and a considerable amount of carrion reduces the crow's longevity as compared to other birds of comparable size. In captivity, all the work is done by man and crows have lived more than 20 years. Man's attempt to hold populations in check also affects average longevity in the wild.

Mature birds are wary in approaching almost anything new or anything pertaining to man. Hunting pressure has sharpened the acute senses of the birds.

Shotgunning, dynamiting, trapping, snaring and even poisoning at roost sites have all decreased the crow's numbers at specific roosting grounds, but no overall decline of crows in the United States has ever become evident.

Millions of birds come to Texas from as far as Canada for the winter, often congregating by tens of thousands in a single county. They usually leave the roost in early morning in search of food in groups of a half dozen to as many as 30. The birds cruise between 20 and 30 miles per hour but have been clocked at over 60 miles per hour.

Before dusk the flocks begin returning, and thousands of birds may be seen in the air in long, steady flight lines which extend for miles and last for two or more hours. In midwinter the returning birds may return to roost from just afternoon until almost dark. It is during this period that crow hunters with mouth-blown or electronic calls kill thousands of black "bandidos" each year.

Crows have perhaps as many ills, misfortunes and enemies as most other animals. Primarily arboreal, they are prey for many predators, especially foxes which climb roost trees and wait. Larger hawks such as red-tailed and red-shouldered hawks are high on

the list of enemies. Owls have been seen snatching young and occasionally take mature birds from the roost for food. Owls also rob crows' nests.

The crow recognizes the owl as foe. Hordes of crows attack a lone owl, swooping, diving and screaming invectives and threats at anything resembling an owl—alive, stuffed or artificial decoy.

Illnesses prevalent in the flocks include roup, epidemics of tuberculosis and intestinal parasites of various types. Many birds have been found infested with lice and ticks. Perhaps the cruelest of all the crow's problems is starvation brought about by sub-zero weather which freezes the bird's eyes and destroys its ability to locate food.

The crow is a good parent. Male birds are monogamous and share the work of incubating and rearing the young with the female. Courtship takes place with slightly more expended energy than in some other birds. It is a noisy, whirling, swooping, feather-puffing display of aerial acrobatics directed at an apparently disinterested female.

Once the male has her attention and has driven away all competition, no Romeo ever courted a Juliet with more vocalizing. The male repeats his mating song until she either succumbs to his "cawing" charms or flies away. This springtime love call, given either in flight or from a nearby perch triggers both sexes to ignore or expel all others of the species and search for a nest site. The potential area is ordinarily large.

Once the site is located, the pair industriously labor from 20 to 65 feet above ground in the largest tree they are able to claim, sometimes in nesting colonies, just as often far removed from neighbors. Home-building is a matter of convenience dependent upon

terrain and habitat. Evergreens are preferred, but low shrubs in treeless, cultivated areas are used at times. They simply use what is available in the area.

The nine-inch-deep nest is a large sturdy structure, firmly anchored to large boughs near the trunk of the tree. It is made of reeds and strong grasses and often includes pieces of rag, twine, bark fibrils and even feathers. The average clutch is four or five. Nests containing eight to 10 eggs are generally those shared by two females. Eggs vary from olive-green or bluish-green to a brownish color with lighter blotches. Incubation takes about 18 days. The young look nothing like the parents and have pinkish skin, a soft downy coating and closed eyes. The eyes open the fifth day, and by the tenth day of life the young birds are hungry and never fail to scream their hungry desires. Young birds venture to the rim of the nest in about four weeks, try their wings at five weeks and are strong fliers soon after.

The crow's diet is 70 percent vegetable and 30 percent animal matter. But nothing growing in a garden or field and nothing on your dinner table is refused. Watermelons, fruits, field grains, frogs, snakes, lizards, insects and carrion are all used as food. Corn crops are extensively damaged in some areas.

No accurate method of determining actual crow populations has ever been decided upon. Biologists and ornithologists agree the crow is one of the more numerous of the 8,600 species of birds.

Good or bad, crows are here to stay and census figures indicate an upswing in crow numbers. In winter months in many parts of Texas, landowners concede that if crows were worth a dollar each, every man would be a millionaire. **

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Each year, each member receives the "Snortin' Bull" decal with his membership, along with quarterly issues of the TSRA "Sportsman." Periodically and as required, the TSRA publishes special bulletins of interest to its members. For example, in March of 1971, the TSRA arranged for the mailing to sportsmen throughout the state of over 70,000 bulletins concerning legislation pending before the 62nd Texas Legislature. Additionally, the TSRA encourages hunter safety programs and seeks to pass along to younger hunters the skills and high ethical standards of sportsmanship essential to a true outdoorsman. We take pride in our high standards, and our assistance to the Texas Legislature is a matter of public record.

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TEXAS CONSERVATION FOUNDATION

by Richard McCune and Jim Cox

A wisp of breeze rustled the green-white branches of the two giant cottonwoods at Gorman's Bend of the creek. James Gorman, white-headed as the underside of the leaves, peered upward through the thick limbs as if saying good-bye to a pair of old friends.

And indeed he was.

Just beyond the two old sentinels lay the hackberry grove where the old Game and Fish Commission had first stocked wild turkeys before World War II. Gorman let his gaze continue and his recollections grow. Beyond his vision was the lake, an earthen dam holding back two dozen acres full of bass the state had also stocked.

It had all meant so much to the Gormans, Jim and Heler. But his wife had gone before him and their three girls who had romped and fished and splashed and worked with them on the small ranch were married and gone with husbands whose successes were being made in cities.

"Good men, all three of 'em," he reflected aloud. "But no use for ranching. Course, they like the place, like to visit here."

Jim Gorman did not want to sell the land which had been his father's. But he was going now to live with the middle daughter in Dallas, and there was no one who wanted the ranch. Not even the game warden, the new young man who had come after Jim had known four good wardens before him, could help him give it away.

But the state could not take it as a gift, the warden said. Not as a park, nor as a wildlife management area. Appropriations. Budget. Funds. A lot of reasons Jim wasn't sure he understood. Heck, he'd just as soon sign the deed over for a dollar, hang the thousands it was worth.

Instead, he was getting the thousands for the land from a development cor-

poration which had been active in the area ever since the new reservoir on the river had backed up a lake over half the county.

Now he would be a very wealthy, and a very tired old man. How much better it would have been, he thought, to have been comfortable, instead, and comforted by the thought that he had given a gift that all the people could use.

A far-fetched case? No. Jim Gorman and his ranch are fictitious, yes, but the situation is not extraordinary in these times.

Since the story is make-believe, let's imagine that it might have happened before 1969. And that would lead to an unhappy ending. So, by bringing the situation up to 1971, we can change the plot. Let's pick up the story in the middle:

Jim has moved to Dallas, all right, and gladdened the home of his middle daughter in a great many grandfatherly ways. For one, he has a new pal in nine-year-old grandchild Mary Alice, whose circle of interests include not only a Barbie doll and a black poodle but also an awareness of the earth and its creatures.

As with many of even the youngest in the oncoming generation, Mary Alice is concerned. She knows that open space is diminishing, that the quality of our air and water is questionable and that some wildlife of the earth is endangered.

One day, after feeding popcorn to the wild mallards on Turtle Creek, she asks, "Grand-daddy, I've saved up almost five dollars and I want to help save the birds and the animals, and make more places where we can go for walks together and have picnics. But I don't know who to send it to. Who could take my money and make sure it's used like

I want it to be?"

Jim Gorman smiles. "Mary Alice," he replies, "I had just the same sort of a problem myself.

"We all loved the ranch, you know, and it was good to your grandmother and me all the years we were running cows and calves. I kept thinking about how much our friends in town liked to come out on Sundays and how much pleasure we all had fishing and hunting and swimming.

"I thought what a nice thing it would be if everyone could enjoy the ranch, maybe as a park, or perhaps a place where deer and turkey could be studied and maybe even where someone could put up a little showcase to tell how the Indians lived here first, before the settlers came.

"So I decided to give it to the people of the State of Texas."

"Give it away? Didn't my daddy or my uncles want a ranch?"

"Mary Alice, your daddy and your cousins' fathers aren't ranchers. They have important work to do in factories and offices. Sure, I talked it over with them before I made my final decision and ever' one of 'em told me, Daddy Jim, it's your place to do with what you want, and if wantin' to make a park or a game place is your decision then it's only up to you to do it.

"So I did it."

"But how? Who said they wanted the ranch?"

"Well, I got to talking with the warden one day and he told me about a new state agency the Texas Legislature set up in 1969 and about 12 men the Governor appointed to it. Called the Texas Conservation Foundation. They don't have a big building, or even an office.

"All of them are professionals and their businesses are all sorts, like biology, investments, real estate, education, oil and gas, banking, law, sales, products, ranching, Texas history and studying the land. And when they're working for the foundation, they're just a group of interested citizens who meet in Austin and make decisions on how to use gifts to the foundation for getting more valuable property for the state.

"Those fellows can actually save up gifts until they have enough to buy a piece of land that would be good for use as some kind of park.

"You see, this foundation has the power to accept any kind of gift—it can be money, or property like ours, or even jewelry—just anything of value. They take the gift and use it in the best way they can think of to get valuable property for us. And when I say 'us,' Mary

Alice, I mean you and me and all the other Texas citizens who love the outdoors.

"One big oil corporation, Atlantic Richfield, already has given \$5,000 to the foundation, and a man and his wife gave a piece of property in Collin County, so the foundation's goin' pretty good already."

"You mean they can trade things to get parks, or places to study animals?"

"Like what they call a game management area? That's right, honey. They'll take two dollars or two acres and figure out somehow it can be used, and appreciated."

"Grand-daddy, I'm going to help, too, just like you did. And I'm not even going to wait until I've saved a whole five dollars. They can have the four dollars and seventy cents, 'cause I'm mailing it, right now."

And, so saying, she did. **

Because the foundation deals heavily in real estate and mineral rights, seven members must have a background in business. Chairman Glenn Biggs from San Antonio is a banker, and has been active in preserving Texas' natural heritage, including the Indian pictographs near Amistad Reservoir and the Guadalupe Mountains National Park.

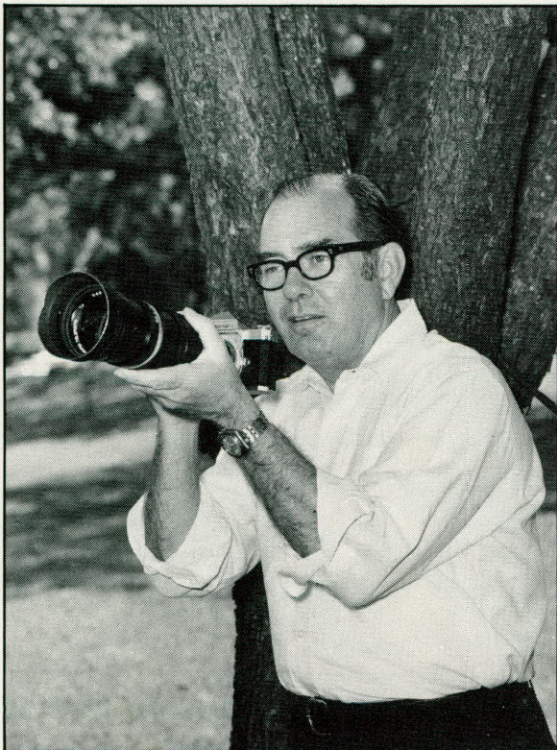


Mary Alice
8742 Wooded Ln.
Dallas Tex. 75225



Texas Conservation Foundation
P.O. Box 12845
Capitol Station
Austin Texas 78711

Ralph Churchill, a Dallas attorney, is a member of the Texas Ornithological Society and an enthusiastic wildlife photographer. He is vice-chairman of the foundation.



A retired Air Force general, James U. Cross is the executive director of the Parks and Wildlife Department, and in that capacity serves as the foundation's secretary.

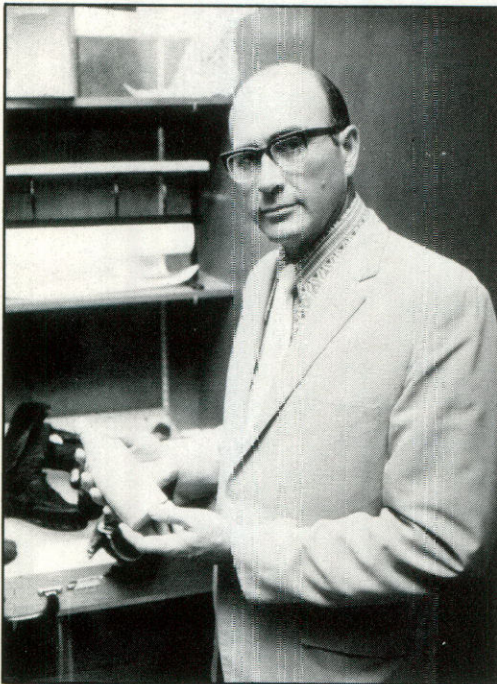


TEXAS CONSERVATION FOUNDATION

C. H. "Pete" Coffield of Houston is a commercial warehouseman who is active in real estate and is a practicing conservationist on his ranchlands.



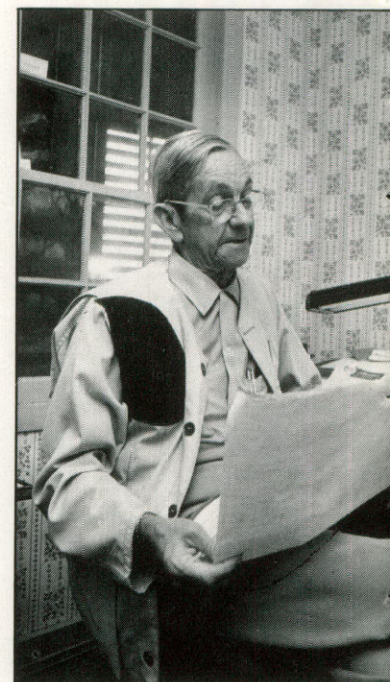
William J. Hendrickson, an insurance man in Wichita Falls, is an avid conservationist, hunter and fisherman. He is the son-in-law of the late former Game and Fish Commission chairman Frank Woods.



Truett Latimer is the executive director of the Texas Historical Survey Committee. His knowledge of Texas history and historic sites makes him an important asset in acquiring land for the foundation.



Michael G. Rutherford of Houston is in the oil and gas production business and has cattle holdings. His expertise in matters of land acquisition and mineral development are essential to the foundation.

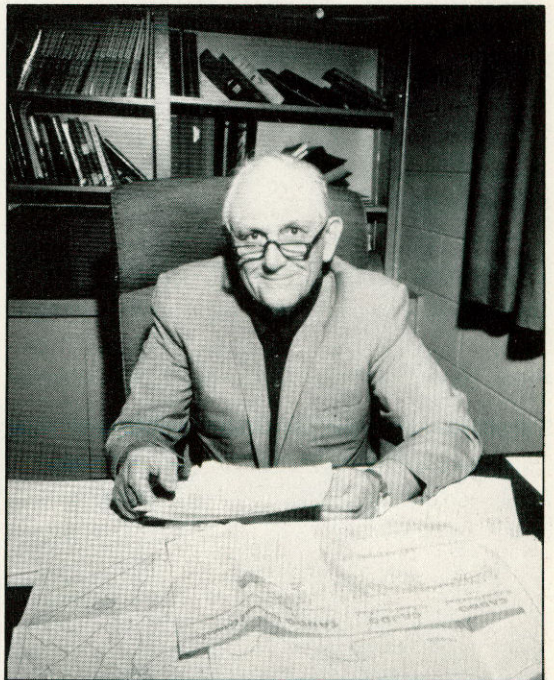


San Augustine architect Raiford Stripling is well known for his restorations of historic sites, including Presidio la Bahia and Mission Espiritu Santo near Goliad.

Public spirited for a long time, Gene Hendryx served as a representative to the legislature from Alpine from 1963 to 1967. An avid outdoorsman and student of Texas history, he is chief executive of his own radio station.



Austin lawyer Pearce Johnson is a rancher, conservationist and outdoorsman. He is chairman of the Parks and Wildlife Commission and in that capacity serves on the foundation.



Harry Lee Tennison, vice-president of a soft drink bottling company in Fort Worth, is an organizer of Game Conservation International and has earned a prominent reputation as a speaker on wildlife conservation.

Elo J. Urbanovsky heads the Department of Parks Administration, Horticulture and Entomology at Texas Tech University. In 1963 he completed a survey of our state parks.

Volunteer for Safety

by Jim Cox

Tragedy strikes in Texas each fall, when hunters fail to heed the rules of gun safety and accidentally kill or injure themselves or their fellow hunters. And an alarming percentage of these unfortunate incidents involves young persons. Also, most firearms accidents occur in the home—mostly in homes where little or no firearm safety training has been received.

In an effort to prevent firearms accidents at home and in the field, the Texas Parks and Wildlife Department has joined with the National Rifle Association in launching Texas' first state-wide voluntary training program designed to instruct youngsters in gun and hunting safety.

The Texas Voluntary Hunter Safety Training Program will utilize volunteer instructors certified by the Parks and Wildlife Department. A group of "senior instructors" has been assembled from the ranks of game management officers and other department field personnel. These senior instructors have received special instructors' training from top National Rifle Association training personnel. They will be assigned the job of supervising and evaluating the field instruction and the volunteer instructors.

A basic six-hour course will be taught at locations throughout the state, and department officials assigned to supervise the program will see that the instruction is of quality and uniformity.

The department is furnishing the administration, supervision and some of the funding for the program. The NRA is providing educational materials, coordination and some special training assistance. A third participant is the U. S. Fish and Wildlife Service, which will provide federal matching funds derived from handgun excise taxes to finance the program.

Fourth, and probably the most important partner in the program, is the volunteer instructor who will actually conduct the classes. Prospective instructors must be at least 21 years of age and pass written NRA examinations before being certified as instructors in the Texas hunter safety training program.

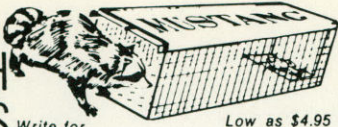
Persons interested in becoming volunteer instructors should contact their local Texas Parks and Wildlife Department office or write to the department at the John H. Reagan Building, Austin 78701, for a brochure and application form.

The program is headed by T. D. Carroll, hunter safety coordinator. Carroll predicts that approximately 2,000 volunteer instructors will be active in the program and a minimum of 30,000 young hunters will be trained during 1972. It is hoped that 30,000 to 50,000 youngsters will be trained each succeeding year.

Permanent records will be kept of all who successfully complete the training course. Shoulder brassards, identifying certified "Safe Hunters" and numbered certification cards will be awarded.

Hunter safety training may be provided for hunters of all ages, at the discretion of the volunteer instructor. However, only those students who have attained the age of 12 years prior to the completion of their training course will be certified as graduates of the program. A one-dollar registration fee, to be collected by the volunteer instructor, will be required of each participating student. **

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WHAT'S A YELLOW BASS?



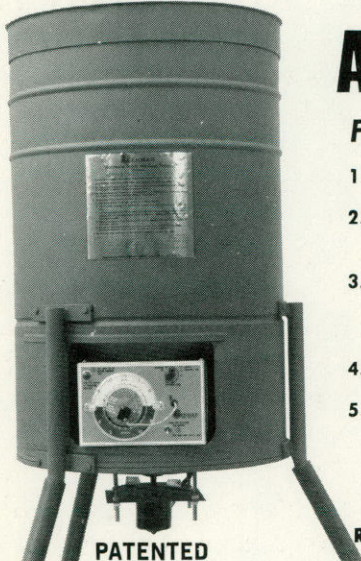
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How To: Make Jerky

by David Baxter Photography by Bill Reaves

The simplest and most delicious way to preserve meat is by making jerky. There is nothing complicated about jerky; it can be made of lean venison, beef, moose, elk, javelina and any similar red meat.

The quickest way to make jerky precludes time-consuming steps which involve soaking the meat in brine and smoking.

Use a flank cut or any cut of meat which has long grains of muscle. Remove all fat and gristle because this will turn rancid. Cut the meat with the grain.

Cut the meat in strips of about five to six inches in length and about one-fourth inch thick. Place the meat in a bowl or dish that can be covered. After the first layer of meat, sprinkle it liberally with hickory smoke salt and a touch of garlic or onion salt for seasoning. Add black pepper if you like it hot or any other favorite spice such as

oregano, marjoram, basil and thyme. Fill the bowl with layers of seasoned meat.

Cover the dish and place it in the refrigerator for at least eight hours. This will give the salt and seasoning time to thoroughly permeate the meat and give it a hearty flavor.

Next, prepare a pan of water for blanching the meat. Blanching will destroy any bacteria on the surface of the meat. For each quart of water add one tablespoon of salt and bring the water to a simmer. Dip each strip of meat into the water and hold it there for about 15 seconds. The hot water will turn the red meat a whitish-gray.

Place the strips of meat on a cookie sheet and into an oven at the lowest possible heat for six to 16 hours or until the meat is coal black on the outside and dark and dry throughout. Leave the oven door ajar a little to allow moisture to escape. This slow heat dehydrates

the meat and shrivels it. When it cools, it is ready to eat.

Jerky has a moisture content of about 10 to 15 percent. Ten pounds of meat will make 3½ pounds of jerky. At the same time the meat will shrink to about half its original bulk, making it light and easy to carry.

Store the jerky in a covered jar. As long as jerky is kept dry and away from insects, it will keep for a long time.

If you have the time and are a traditionalist, soak the strips of meat in a seasoned brine solution. The solution is made of about five cups of water, one cup of salt and the above seasonings.

Soak the strips of meat in the brine for about 15 minutes then allow them to drain. After draining, allow the strips to cure for a week to 10 days outdoors over a low smoky fire. The fire should not be hot enough to cook the meat. Cover the meat at night.

CUT WITH GRAIN OF MEAT.



SEASON WELL.



No matter how it's made, jerky is a fine snack and has sustained many an outdoorsman in the field.

Jerky is also the main ingredient in pemmican. Pound up a quantity of jerky. Cut cubes of raw animal fat and render it over a low fire. Do not let the grease boil. Pour the hot fat over an equal portion of shredded jerky and mix the two together. Pack the mixture in commercial casings or in waterproof bags. Pemmican requires no salt and is one of the best concentrated foods available to the man in the field.

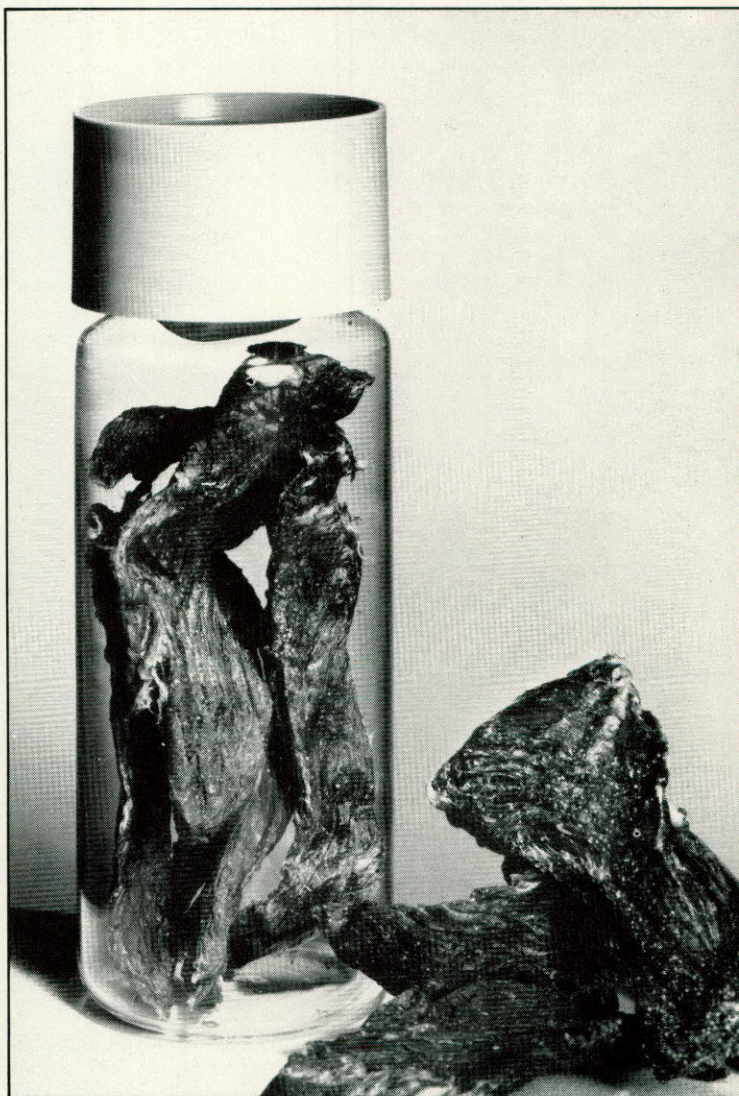
Jerky which is too dry will crumble. Crumbled jerky is good in milk gravy and served over bread or toast. It's a lot better than what the mess sergeant used to serve.

If jerky is the only meat in camp, break it into small bits and sear it in a pan with a little shortening. Sprinkle with flour, add water and cook until tender. Add vegetables if available. **

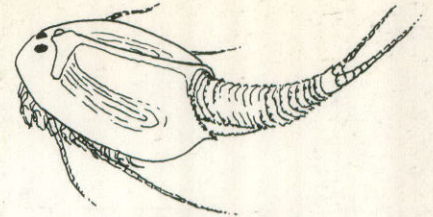
PLACE IN OVEN.



KEEP IN A JAR.



LETTERS TO THE EDITOR



Desert Shrimp

Bounty System

After reading the article "Texas Cats" in the October issue, I felt compelled to write my first letter to an editor in defense of these magnificent animals. It is sad and deplorable that a bounty system is still authorized by law and that bounties are paid on the bobcat in 16 counties and on the mountain lion in two counties. This is at a time when the estimated lion population in our entire state is only 65 to 150 animals.

My family has trudged our way to the top of some of the Colorado Rockies just in hopes of glimpsing a Rocky Mountain bighorn sheep, but we can only imagine the thrill of seeing one of the great, shy and secretive mountain lions in their natural habitat instead of a zoo in our native Texas. The chances of ever seeing one seem to be getting even slimmer.

I would hope and expect that the *Texas Parks & Wildlife* magazine, in its dedication to the conservation and enjoyment of Texas fish, game, parks and waters, will use every source and

means available to insist on protection of the remaining few individuals of this vanishing species. Maybe it is too late for the jaguar and Florida panther of East Texas, but there may yet be time for the mountain lion.

California trapped and shot its golden bear out of existence. The only golden bear today is a symbol for one of its universities. I hope my children will not know the cougar only as a non-existing symbol of the University of Houston.

Mrs. Kenneth Box
Houston

It has been this department's policy for many years to discourage the bounty system, and we worked at the last meeting of the Legislature to try to stop this system. We hope that in the future there will be no bounties on predators. We also hope that there will always be a wild cougar population in the State of Texas and that this animal will only be killed when an individual animal has been proven as extremely detrimental to livestock operations.

We are sending you a strange creature that we can't identify. Would you please help us get some information about it? We found it in a playa lake which dried up last summer but is full again because of recent rains. Liz and Diane saw frogs eat these creatures; David saw the "things" eating weeds; Pete saw them eating mosquito larvae; and Mary fed corneal to some.

Here is what we want to know: What is it? How big does it get? What else does it eat? Is it harmful or helpful to us or other living things? Is it native to our area?

Teresa Harkrader
Pampa

The animal is a crustacean. Some people know it as a desert shrimp or tadpole shrimp. It is a member of the Eubranchiopoda family. Members of this family usually live in temporary ponds and pools and cannot be found normally in running waters.

The specimen you sent in is in the order Notostraca, and it is about the average size for an adult. They eat algae, bacteria, protozoa and rotifers. They will also eat the material which you fed them as they are not extremely selective and will eat just about anything.

Amphibia, dytiscid larvae, caddisfly larvae, and perhaps a few other insects are the chief predators of these shrimp. They are of no importance in the diet of fish since they occur in bodies of water too alkaline, too small or too temporary to support fish.

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BACK COVERS

Inside: Because of this kind of senseless killing many people think all hunters, including those who hunt with respect and discretion, are drunks who take pleasure in destruction. This is not good sportsmanship, much less good conservation. One wonders how satisfying the slaughter was. Photo by Richard Curtin.

Outside: The common egret is a resident of east and south Texas marshes, ricefields, ponds and shores. Photo by Bill Duncan.



