

TEXAS

PARKS & WILDLIFE



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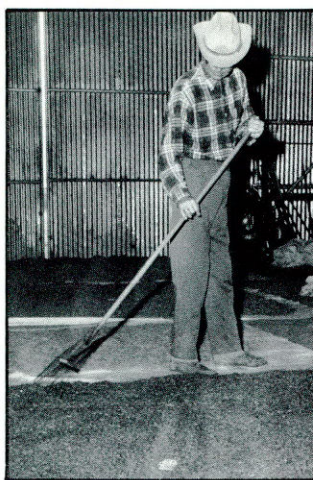
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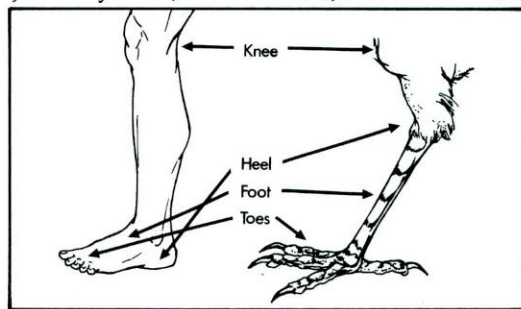
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Front Cover: This beautiful buck, photographed last October, represents the high-quality of wildlife which can result through wise land management practices. Our present deer population is estimated at 3½ million animals. Photo by Perry Shankle, Jr.

Inside Front: Almost exterminated in Texas during the late 19th century, wild turkey populations are now steadily increasing. For answers to your questions about this game bird, see related story on page 14. Photo by Bill Reaves.



Terns

by Tim Leifeste

Dropping like a winged arrow, the tiny tern folds its wings as its spinning body splashes into the water bill-first and disappears below the surface.

An instant later the tern emerges, loudly announcing triumph with a small fish clasped in its bill. On the ascent the bird shivers violently, struggling to shake off the water as it seeks to regain altitude.

Goal achieved, it flies rapidly around in a circle. The tern's flight is light, airy and graceful as it surveys the sea below with its slender, spikelike bill held pointed straight down toward the water. Round and round the bird goes, flapping its wings without intermission.

Suddenly, it flutters its wings in rapid vibration, seeming to hover, but then proceeds as before. Doubtless there was another small fish near the surface which disappeared before the bird could begin its descent.

Presently, the tern again stops short, flutters, then dives daringly and perpendicularly toward the water. Its body rotates irregularly, as if by jerks. But alas, its purpose is again frustrated; and, on nearing the water's surface, the tern recovers gracefully and swoops skyward again to continue the feeding ritual.

Terns feed almost wholly on small fish not over three to four inches long. Some species, to a greater or lesser extent, supplement their diets with shrimp, aquatic insects and other small marine life.

In addition to feeding themselves, adult terns must also feed their offspring, until full-grown, and even their mates at times, generally during nesting. In fact, feeding plays an important role in the mating ritual. The male offers his chosen companion a small fish, much as we would offer a ring, to begin the courtship.

In Texas, there are 10 species of terns which are permanent or temporary inhabitants along our coast. Particularly harmless and gentle birds, they were once hunted for their immaculate plumage. During the "Gay Nineties" their feathers and skins were valued highly by the millinery industry and fashionable ladies. Gunners got 10 to 12 cents for the skins of one species—the least tern, *Sterna albifrons*, the smallest and seemingly the most delicate of the family Sterninae.

In one season year during the 1890s, over 100,000 least tern skins moved through the marketplaces of the world. They became rare on the Atlantic coast

and almost disappeared; but thanks to changing fashion and laws which gave all terns protection, the least tern is again relatively plentiful as are most other species of terns.

Least terns are commonly observed all along the Texas coast, particularly in the Laguna Madre, from March to November. Though it winters south of the United States, it breeds locally.

Whereas the least tern is the smallest of its tribe, the Caspian tern, *Hydroprogne caspia*, is the largest, almost the size of the herring gull. Primarily a tern of the bays and adjacent marshes, the Caspian is the dominant, ruling spirit in any ternery. It scorns the companionship of other species, holding itself aloof and living a little apart from the others.

When fishing, the Caspian usually flies only a few yards above the water in the typical ternlike manner (bill pointing straight downward), but when traveling it flies at great height, bill pointing straight forward (also typical), making rapid progress even against the strongest winds.

It is a year-round resident, breeding locally, with the greatest numbers being found in colonies on the Nueces Bay Islands. Relative to other species,



Graceful, slender terns provide an entertaining sight as they plunge perpendicularly into the water to feed. Their headfirst dives usually provide them with small two- to three-inch fish such as the one about to be offered to the least tern chick on the opposite page.



Royal tern by John Suhrstedt

Royal terns by John Tverten





a Texas Parks and Wildlife Department survey indicates this king of the terns may be on the decline and occurs in very low numbers on the Texas coast.

The Caspian lays from two to three eggs, which man has been known to collect in the past for culinary purposes, and raises one brood per season.

Similar in general appearance to the Caspian is the royal tern, *Thalasseus maximus*. So closely do these two resemble each other that even Audubon had trouble in distinguishing between the two, confusing them under one name, cayenne tern.

In flight, however, the royal is slimmer and its tail is forked fully half its length; the Caspian is forked only a quarter of its length. Also, the royal's bill is more slender and orange, rather than the characteristic red of the Caspian's.

Though webfooted and perfectly capable of swimming, the royal, like other terns, seldom alights on the water and is a very poor swimmer due to its weak legs.

Most commonly found south of the Colorado River, large colonies have been observed on the islands of the Laguna Madre and the Pelican Island area in Corpus Christi Bay throughout the year.

Seldom is the royal found without its smaller relative the Cabot's or sandwich tern, *Thalasseus sandvicensis*. They are also closely associated with black skimmers and laughing gulls, which they never seem to molest.

The Cabot's tern summers along the central and lower coast of Texas with the majority nesting in the Laguna Madre.

More of a sea bird than its smaller relatives, it can be seen feeding out on the open sea or among the breakers rather than in the quiet tidal estuaries. Cabot's tern is one of the swiftest and most skillful of the terns and its long, slender, pointed form is highly specialized for speed and ease in cutting air.

Intermediate in size between the two large terns and the several smaller species, it seems to combine the strength of the former with the activity of the latter.

Probably the most familiar to observers of terns along the Texas coast in the summer is the Forster's tern, *Sterna forsteri*. It's a small, black-capped gull-like bird with an orange-red, black-tipped bill and a deeply forked tail. During the breeding season, it is essentially a bird of the marshes. At other times it can be seen along sandy beaches and over the waters of the Gulf and bay areas.

The Forster's tern closely resembles the common tern, *Sterna hirunde*, which is a common migrant to the Texas coast. As a species apart from the common tern, the Forster's remained long unrecognized even though the two differ in several details and habits.

The common tern feeds mostly on small fish; whereas, the Forster's, pre-

ferring primarily the marshes, has a more varied diet. It can be seen catching insects on the wing or looking for tiny morsels on the water. Unlike the common tern also, the Forster's seems to prefer dropping down lightly and picking up its food without wetting a feather instead of taking a diving plunge.

Larger and paler than the common or Forster's terns is the gull-billed tern, *Gelochelidon nilotica*. Unlike others of its tribe, this tern is primarily insectivorous in its feeding habits. It is commonly seen in and around the storm ditches within the city of Corpus Christi and is a resident of the coastal bays and salt marshes.

From winter quarters in Central and South America, gull-billed terns make their appearance in Texas in March and April during their spring migration. A Parks and Wildlife survey concluded more work needs to be done concerning this species because it may be slowly disappearing as a nesting bird in the state.

Another common migratory tern (April-June, July-November) along the Texas coast is the black tern, *Chlidonias niger*. As its name implies, it is the only black-bodied tern.

A restless waif of the air, the black tern can be seen flitting about hither and thither, light and buoyant as a butterfly. It's mainly insectivorous, though when in the company of other terns along our coast it will feed on small



Three or four buff, spotted eggs are laid in a grass-lined nest by the Forster's tern (opposite page left), but the sandwich tern (opposite page right) lays its one or two spotted eggs directly on the bare sand. Those who disturb nesting terns endanger both eggs and young since exposure to the sun for only minutes can prove fatal to the developing or newly-hatched young.

minnows and the fry of other fish.

A more uncommon resident to our shores is the sooty tern, *Sterna fuscata*. It is the only tern that is black above and white below.

Found in the tropics, the sooty formerly bred on our coast and still does occasionally. Nesting sites have been observed on spoil islands at the entrance of Baffin Bay and on Pelican Island; 12 nests were found in the Lower Laguna Madre last summer. It breeds singly or in small groups among royal terns. But most of the sooty's breeding occurs on remote islands in tropical waters where it is one of the best known sea birds and a popular producer of eggs which some islanders gather and use for food. It spends most of its time out at sea on the wing when away from its breeding place, but is occasionally blown inland by hurricanes.

The roseate tern, *Sterna dougalli*, about the size of a Forster's, is a rarity in Texas although it has been observed at least once but less than five times a year. It is known as the greyhound of its tribe and the most highly specialized of the terns. Its flight is exceedingly light and graceful.

"Sea swallows" all, terns are the most charming and graceful of the water birds found on our coast. One cannot help admiring such elegant creatures as they fly effortlessly along the beach, accompanied by summer sunshine and cooling sea breezes. **

Black terns by John Tveten





Arizona cottontop

Helping Nature Recover

by Lynn Pace and David Riskind, Texas Parks and Wildlife Department
and Jacob C. Garrison and Arnold Davis, Soil Conservation Service

Communities and species of plant life found today in our state parks, and in other parts of the state as well, are often quite different from those observed a century ago.

Influenced only by the laws of natural succession, this land once supported a time-tested and nature-proven mixture of native plants and animals particularly adapted to the region in which they occurred. However, subsequent livestock grazing pressures, land clearing, soil erosion, timbering, fire control measures, urbanization and a host of other man-influenced factors drastically changed this relatively stable condition. Plant populations fluctuated. Those plants desirable for livestock forage, timber or other uses gradually were removed through constant and prolonged utilization. In time, they were replaced by better adapted and often less desirable species.

Today, plants once predominant in this climax (or undisturbed) community are present in only small quantities or lacking altogether, while less desirable plants, or what many consider to be weeds, are often

present in amounts far exceeding normal proportions. Such is the case on many of our state park lands.

Often, land acquired for the state parks system has undergone many years of use, or misuse, prior to park establishment. In order to restore this land to its previous natural climax setting, certain corrective measures must be undertaken by the Resource Management Section of the Texas Parks and Wildlife Department.

Through selective brush control practices, range seeding of native grasses and forbs, tree and shrub plantings and other conservation treatment measures, coupled with sound land management practices, this rehabilitation process can be achieved sooner than if only natural processes were at work. Natural recovery could take many decades or even centuries.

It was quickly recognized, however, that not all species required to rehabilitate the natural communities in a particular park were readily available. Although private, commercial seed companies could supply some of the species, the need for a source of

Little bluestem



Native seeds and plants are now available for use on state park lands through an agreement between the Soil Conservation Service's James E. "Bud" Smith Plant Materials Center near Knox City and the Texas Parks and Wildlife Department. At the center, some 70 acres of irrigated cropland are devoted to growing more than 290 different species of native plants.



Aerial view of center

After the seedpods are harvested, they must be thoroughly dried; and the weather determines whether this is done inside or outside (right). When dry, the pods are processed through a hammermill to break them open and release the seeds. Seeds are then separated from the waste material (extreme right), sacked and labeled for future plantings. Hay and wastes from cleaning are made available for use as mulching materials on critical areas within the state parks.



adapted native grasses, forbs, legumes and woody plants ultimately resulted in an agreement between this department and the United States Department of Agriculture's Soil Conservation Service.

Under this agreement, the Soil Conservation Service allocates native seed and plants to the Texas Parks and Wildlife Department for use on park lands through the James E. "Bud" Smith Plant Materials Center near Knox City in North Central Texas.

A full-time biologist represents this department at the center where he trains in horticultural techniques, assists in the center's operational procedures and provides direct assistance to area parks in the application of plant materials.

Established in 1964, the center is maintained and operated for the selection, development, testing and production of plants for conservation purposes. Working through local soil and water conservation districts, the Soil Conservation Service collects, evaluates and distributes plant materials throughout Texas and western Oklahoma.

The center consists of about 70 acres of irrigated cropland. Here over 1,400 accessions, or plant collections, are being evaluated. Approximately 290 different species, including 120 grasses, 100 forbs and legumes and 68 woody plants, were being grown for evaluation or production. Based on 1973 crop-year records, 8,000 pounds of seed, 8,538 plants and 30,760 rhizomes were grown for evaluation by water conservation district cooperators.

Following completion of the 1973 crop harvest, 752 pounds of seed, representing a variety of native plant species, were allocated by the center to the Parks and Wildlife Department for use in state parks. During the same period 7,000 plant rhizomes and 865 native

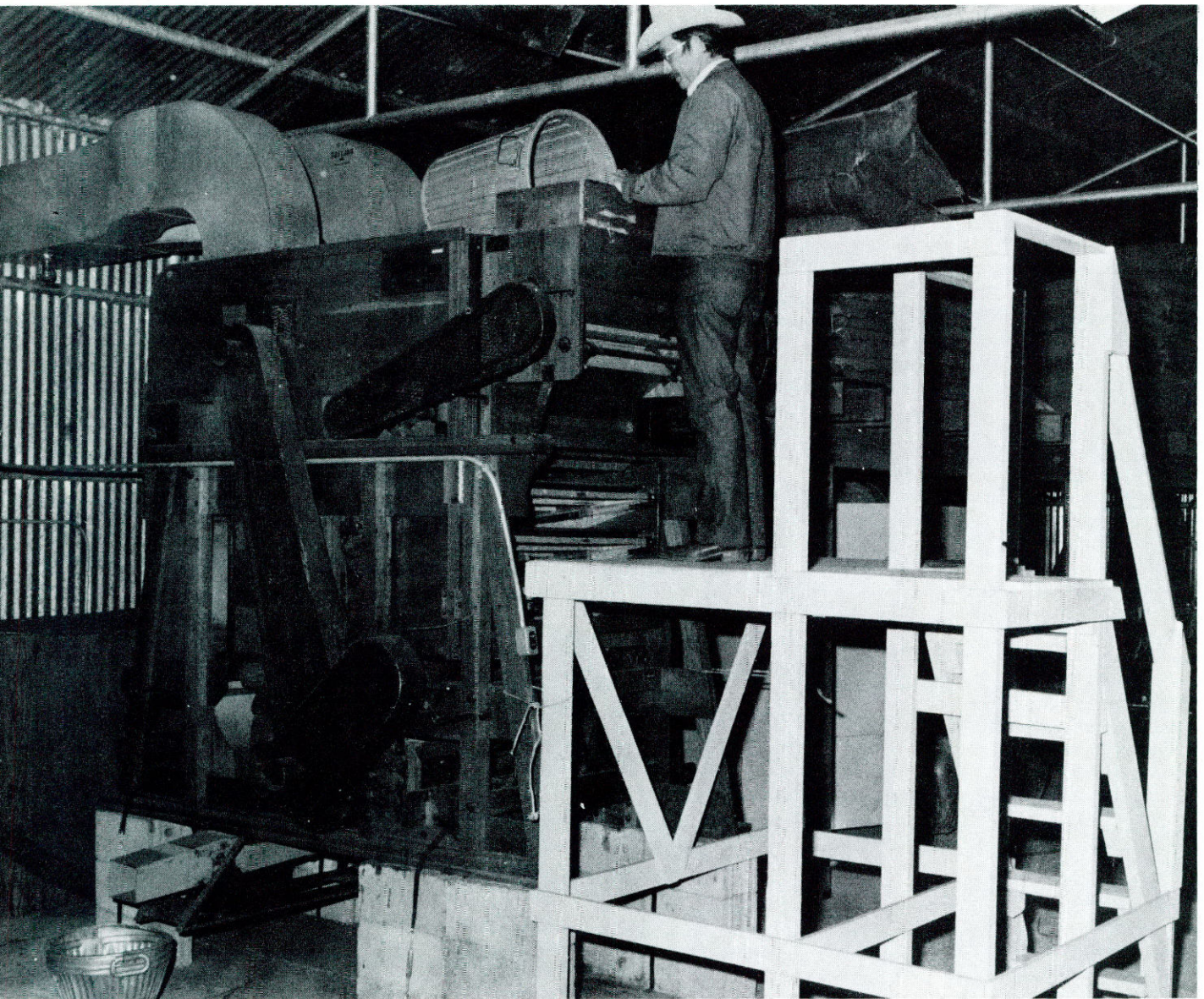
plants were also made available. Native grass hay and seed cleanings were used as mulching materials on critical areas within the parks. Small amounts of native seed and plants suitable for landscaping, beautification and special interest areas are provided whenever the center's supply allows.

This year approximately 2,600 plant rhizomes, 200 plants, 150 pounds of seed and over 350 bags or bales of hay and mulch material have been shipped from the center to various parks throughout the state. These materials have been used in such projects as rangeland seeding, vegetative screening, beautification, landscaping and the reintroduction of native plant species into their former habitat in Texas parklands.

As park needs increase, the center will correspondingly increase its production of certain species to meet the needs. During the 1974 crop year, approximately six acres at the center were devoted to Parks and Wildlife plantings. Included in these were such species as little bluestem, sideoats grama, blue grama, switchgrass, Indiangrass and Maximilian sunflower. A selection of rare and endangered plants were also produced in small quantities for park use.

Parklands provide an excellent opportunity to recreate or synthesize the natural climax conditions that once prevailed over the landscape. Using relict sites and historical accounts referring to vegetation as a guide and by incorporating current technical information on plant production and species distribution, the resource manager can reestablish many of the native plant communities in our state parks.

Through the efforts of both the Soil Conservation Service's Plant Materials Center and the Texas Parks and Wildlife Department, the park visitor may soon be given a glimpse of how things used to be. **



OUTDOOR BOOKS

INDIAN SCOUT CRAFT AND LORE by Charles A. Eastman; Dover Publications, Inc., 180 Varick Street, New York, N.Y. 10014, 1974; 190 pages, \$2.

Everyone has a story to tell which would probably make an interesting book, and this is why some persons feel compelled to write. But, what makes one book sell better than another is the reader interest. Often, as is the case with this book, the unique quality does not lie so much within the written pages as with the author.

Although credit is given to Charles A. Eastman, the author's native name is Ohiyesa. A full-blooded Sioux Indian, Ohiyesa was a teenager and young warrior in the 1870s and 80s, a time often remembered only in history books. This first person account of a man's life as he experienced it makes the past seem more relevant and meaningful. It was first published by Little, Brown and Company in 1914 under the title *Indian Scout Talks: A Guide for Boy Scouts and Camp Fire Girls*.

The book is not political. Ohiyesa plays only to the human interest by discussing folklore, crafts and how-to shortcuts which helped the Indian survive a life without the luxuries we know today.

The author's readership appeal lies somewhere between the mature reader and the young child who must have excitement on every page to hold his attention. That is not to say the book is boring. On the contrary, it is quite interesting for the reader with an appropriate sense of time and history.

Consistent throughout the book are tales describing how to do something. In most cases it is not the intent of the author to describe the craft in detail so the reader can duplicate his actions. Instead, the tale is told to illustrate the rudiments and help the reader appreciate Indian crafts. For example, Ohiyesa discusses how to hunt with a slingshot and how to construct a canoe.

A book of this nature makes the reader want to meet the author and ask many questions not answered. Secondly, it arouses a sense of pride for a sometimes forgotten segment of this nation's heritage and an appreciation for the outdoors. *Indian Scout*

Craft and Lore should be read by those whose interests parallel this theme. —Terrie Whitehead

THE NORTH AMERICAN ALLIGATOR by Jim Pruitt and Nancy McGowan, illustrated by Nancy McGowan; Steck-Vaughn Company, P. O. Box 2028, Austin, Tex. 78767, 1974; 30 pages, \$4.68; and **THE BROWN PELICAN** written and illustrated by J. M. Roever; Steck-Vaughn Company, P. O. Box 2028, Austin, Tex. 78767, 1974; 30 pages, \$4.68.

If you are collecting all of the books in the Steck-Vaughn endangered animals series for your children, you will be interested to know that two more have been released.

According to the general format of the series, both books include informative, factual information in a readable, well-illustrated style for the young reader. The last two sections of each book tell the reader why the animals are becoming extinct, what the existing laws are concerning the animals and what the young person can do to help preserve the endangered species. Learning aids such as pronunciations and definitions are included with material unfamiliar to the child.

How can an alligator make sounds without vocal cords? How does he swallow food without getting a mouthful of water and what does he eat? These and many other questions the beginning reader may ask are answered in *The North American Alligator*.

In *The Brown Pelican* the author reveals that the bird really isn't brown, along with other fascinating facts. On causes of near extinction, one of the saddest destructions of the birds came during World War I on Pelican Island National Wildlife Refuge. Rumors spread that pelicans were eating fish needed by hungry people, and hundreds of birds were clubbed to death one night as a result.

Parents need to encourage children to read in order to build vocabularies and to increase comprehension. Hopefully the end result is a well-rounded child with a better understanding of the

world and its inhabitants. Educational books such as these two certainly provide the stimulus for prolonged interest in a subject and a desire to read more. —Terrie Whitehead

ARCHAEOLOGY by Denise Schmandt-Besserat; Steck-Vaughn Company, P.O. Box 2028, Austin, Tex. 78767, 1974; 42 pages, \$2.95.

A visit to the nearest museum will reveal many artifacts of natural history, but did you ever consider just how those pieces came to be in a museum, or their significance in determining history? Defined as the study of people, customs and life of ancient times, archaeology tries to answer questions about what life was like in a designated period of time.

Archaeology is one of 18 introductory books in a series on sciences and social sciences and is directed at the elementary-age child. Although the book is interesting and educational, it is not one of the best books in the series because of an inconsistency in the use of definitions and pronunciations of difficult words. Aside from this minor deviation, the author presents a straightforward and informative description of the archaeologist's role.

Most of the photographs are borrowed from the University of Texas Archeological Survey and the University of Chicago Oriental Institute. The author makes good use of the photographs by asking the young reader to evaluate what he sees in the pictures and speculate on what the history may have been. Since many of the photographs were contributed by the University of Texas, the author could have stimulated local interest if she had included with her captions the locations of the discovered artifacts.

Overall, the book is highly informative and even discusses the use of carbon 14 in calculating the approximate age of artifacts up to 40,000 years old. Archaeology is an interesting subject, and the book provides thought-provoking questions. Sometimes it is interesting to speculate what archaeologists (if they are still called that) will hypothesize about our culture years from now.—Terrie Whitehead

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Back Cover — Whitcomb; 4x5 Graphic View, 150mm Symmar; Ektachrome.

LONG SHOTS SHORT CASTS

compiled by Neal Cook

Beautiful Communities: Everyone likes to have a better place to live, but those of you who have been actively working to make your city or community a better, more beautiful place can now receive statewide recognition for your efforts. The Beautify Texas Council is accepting entries for its Fifth Annual "Governor's Community Achievements Awards." These six awards will be presented in June to six areas, based on their populations, for work done in 1974 to "prevent the degradation and deterioration of the natural beauty in our cities and in the country." If either an organization of which you are a member or your city government has worked on beautification programs, anti-litter campaigns, innovative methods of trash collection and disposal or other similar programs, then you need to let the Council know of your interest in competing. Please write to: Beautify Texas Council, Drawer CS College Station, Tex. 77840, and tell your cities' name and population as well as your name and address. You will also be told if there are others in your area who are working on an entry so that your efforts can be coordinated.

Late Dove Season: During the past two years a split season was held on mourning doves to allow a September and January hunt. This year the season was not split in the north zone, but hunters in the south zone will have another chance for a hunt from January 4 through January 19. As in the past, the daily bag limit is 10 and the possession limit is 20 with shooting hours from noon until sunset.

Save Energy Units: Two scientists have studied Americans' energy use patterns and made some interesting conclusions. The energy you use to light your home amounts to three times the total energy consumed for everything by a person in Haiti. Each American uses a total of 9,500 energy units a year, trailed by residents of Kuwait at 8,610, and Canadians at 7,870. In contrast, an Italian uses 2,245 energy units, a Paraguayan 119, and a Nepali eight energy units per year. Other figures point out that we Americans use a tremendous amount of energy to maintain our life-styles which could be reduced with few inconveniences if necessary.

Cooperative Cleanup

Commercial and sport fishermen and state game wardens work together to remove abandoned trotlines in bay area.

Article and photography by Ed Dutch, Information Officer, Edinburg

Commercial and sport fishermen may not always see eye to eye, but a recent cooperative coastal waters cleanup had them working side by side with Parks and Wildlife Department game wardens to remove abandoned trotline stakes from Corpus Christi Bay and the Upper Laguna Madre.

As a result of the new saltwater trotline regulations which prohibit the use of all artificial baits such as plastic worms or colored tape materials, both commercial and sport fishermen have abandoned many of their trotlines all along the Texas coast. The reason is simple. When natural baits were required, it became virtually impossible for each fisherman to tend the number of lines that most of them had in the water. Since most of the trotline stakes were firmly stuck in the bay bottoms and hard to remove, the fishermen simply took their lines and left the stakes in place.

These newly abandoned stakes,

added to the old stakes which have accumulated over the years, have caused some of the bays of our coastal areas to become so cluttered that navigation is almost impossible and occasionally quite hazardous. Such was the situation in Corpus Christi Bay and the Upper Laguna Madre.

Commercial and sport fishermen, along with 26 department game wardens and their supervisors, removed five barge loads of materials in two days. They dragged an estimated 5,000 trotline stakes and other hazards to navigation from the waters of the bay area and south to Intracoastal Marker 39. This debris was deposited on a spoil bank, allowed to dry and then burned by the Corpus Christi Fire Department.

Without the legal authority provided by the game wardens, this cleanup could not have been undertaken. It was the wardens' responsibility to check all trotlines, remove any illegal ones and mark the stakes for removal by the

fishermen. However, without the help of the commercial and sport fishermen, who not only volunteered their time and energy but also shouldered the expenses of operating their own boats, this cleanup campaign would not have been a success.

Many people have commented on how much easier navigation in the bay area has become since the cleanup and have expressed their desire to make the effort an annual affair. This would not be necessary if fishermen who put out trotlines in the first place removed them when they were no longer being used.

Hopefully, the cleanup idea will spread up and down the coast so that more of the coastal waters of the state can be made easier and safer to navigate. Cooperation between commercial fishermen, sport fishermen and the Parks and Wildlife Department game wardens can accomplish this, and perhaps many other goals. **



Abandoned and decomposing duck blinds (right) were also authorized for removal by state game wardens during the bay clean-up effort. Cooperation between commercial and sport fishermen and game wardens (below) resulted in five barge loads of potentially hazardous materials, including some 5,000 trotline stakes, being collected in two days.





Learn About

Turkey

by Robert L. Cook, Biologist, Kerr Wildlife Management Area

Turkey were almost exterminated in Texas by late in the 19th century. However, the first step was taken to protect these game birds in 1897 when trapping was outlawed for five months of the year. In 1903, a bag limit of 25 turkey per day throughout a five-month season was initiated. These liberal restrictions failed to help the turkey in most of its range, since there were few game wardens to enforce the laws.

In 1919, the legislature created a bag limit of three bearded gobblers per season. Increased protection by conservation-minded landowners and additional game wardens in the 1920s helped turkey populations to begin a steady increase. Also, since that time, the Texas Parks and Wildlife Department has trapped over 10,000 turkey and restocked them to suitable habitat throughout the state in an effort to restore the wild turkey to its historic range.

There are presently two varieties of wild turkey common to Texas. The Eastern turkey, *Meleagris gallopavo silvestris*, is found in the forests and dense thickets of East Texas and is rarely seen because of

its wariness and scarcity. The Rio Grande turkey, *Meleagris gallopavo intermedia*, is found in most of South, Central and North Texas. The Merriam's turkey, *Melagris gallopavo merriami*, once roamed the mountains of West Texas, but were extirpated by 1907. Attempts to restock this turkey have not been successful.

In general, the Eastern turkey is darker and larger than the more common Rio Grande variety. A mature Rio Grande gobbler averages 16 to 18 pounds, while the Eastern bird averages 19 to 21 pounds.

Biologists of the Parks and Wildlife Department are trying to save Texas' Eastern turkey and restore it to its former range. The few remaining birds are carefully protected by game wardens and landowners, and efforts to restock suitable areas with wild-trapped birds are made each year. Efforts are also being made to develop a hybrid turkey which could be satisfactorily established in portions of East Texas.

Following are some of the most often asked questions about wild turkey in Texas.

How long do wild turkey live?

Turkey live an average of two to three years; however, upon reaching maturity their life expectancy increases substantially. Most mortality occurs in poults (young-of-the-year) and yearlings. A few birds have been known to live as long as 10 years.

Where did the wild turkey come from?

Wild turkey are native to America and probably evolved from pheasantlike ancestors. American Indians ate turkey and used the feathers to adorn themselves and their weapons. Cortez, the Spanish explorer, found the Aztecs and other Indians in Mexico in possession of domesticated wild turkey in 1519. The explorer Vasco de Gama introduced the wild turkey into Europe.

What do turkey eat?

Turkey are primarily vegetarians, although they eat many insects, snails and other invertebrates. Major food items during the spring and summer are green grasses and forbs (weeds), buds, flowers, seeds and insects. In the fall and winter, turkey take fruits, mast such as pecans and acorns and green forage such as Texas winter grass, oats or wheat, depending upon availability.

How many eggs does a hen usually lay?

Ten or 11 eggs make up the average clutch laid by each hen, and it takes her about two weeks to lay

them. Most eggs are fertile and will hatch upon completion of the 28-day incubation period if not destroyed or unduly disturbed.

Do most of the eggs hatch or does something happen to them before the incubation period is complete?

Overall nesting success in turkey is similar to that of most ground-nesting birds. About one-third of all eggs laid will eventually hatch. Weather is the main factor limiting Rio Grande turkey nesting success. If there is insufficient ground moisture, the eggs will get too hot and dry during incubation and the embryo will die. Studies indicate that almost one-half of all turkey nests are destroyed by predators. If weather conditions are good, however, a reasonably good turkey hatch can be expected in spite of predators and other limiting factors.

How long do the hen and young stay on the nest?

The hen and newly hatched poults stay on the nest about one full day. Poults begin to roost in trees at about two weeks of age, but can fly well for short distances at 10 days. During this critical period, predators account for many poult losses. Although a hen may have hatched nine or 10 poults, only two or three may be left at the summer's end.

Can a bearded turkey hen raise young?

Yes. They (about 15 percent of all Rio Grande hens in Texas have visible beards) are as productive as



hens without beards. Beards appear on older hens and increase in size and thickness with age.

Why are some wild turkey gray or even white?

Gray or white turkey in the wild are usually genetic color aberrancies compared to the well known "black sheep." They are not domestic turkey gone wild or descendants of domestic turkey. White or gray turkey are often wilder than turkey of normal coloration.

What is the most important limiting factor on Rio Grande turkey?

Weather, especially dry weather in Texas. Droughts lasting several months may cause reductions of up to 50 percent in wild turkey flocks. During dry weather, turkey are weakened by poor forage conditions and are more susceptible to disease, parasites and predators. Most turkey eggs will not hatch in hot, dry weather and the few poults that do hatch must soon have moisture to survive. Sufficient rainfall during the late spring and early summer months is essential to good turkey production and survival.

Wouldn't a good predator control program increase turkey numbers?

Not necessarily. Wild turkey have survived and reproduced for thousands of years in spite of the presence of every known predator in North America. With good weather and range conditions, turkey have little trouble contending with pressure from predators. In addition, it is expensive and difficult to effectively reduce predator populations.

Why do we hunt turkey?

Turkey provide thousands of hours of recreation for sportsmen as well as a delicious addition to the menu. Legal hunting pressure has never been a limiting factor on turkey in Texas since less than 10 percent of the entire population is harvested by hunters annually. Turkey can withstand an annual harvest of at least 20 percent of the population. If these birds are not taken by sportsmen during the hunting season, they will eventually die and be wasted.

Shouldn't we protect hens?

To properly harvest turkey and maintain sex ratios, it is absolutely necessary to harvest both hens and gobblers. Ranchers wouldn't sell only the male offspring from their livestock herds. The same principle applies to turkey since surpluses occur in both sexes. Continual harvest of one sex will create an imbalance in the sex ratio. In addition, turkey hens are difficult to distinguish from young gobblers, and the average hunter finds it almost impossible to distinguish a bearded hen from a gobbler. As in the case with most game birds (waterfowl, quail, dove), it is practical to allow and encourage the harvest of both sexes. A reasonable either-sex harvest will not hinder turkey production.

Why hunt gobblers in the spring mating season?

Although the spring gobbler season is relatively new to most Texans, it is traditional in most southern states and is probably the most practical of all hunting



seasons, since it is held after the hens have been bred and are laying or incubating eggs. Hunting game animals during their breeding season is a common and established principle to big game hunters. Because of his gobbling and strutting activities, the male turkey is easier to distinguish this time of year. Hunters can also use calls to lure gobblers within range.

Hens need to be bred only once each spring to fertilize their entire clutch of eggs and each dominant gobbler usually mates with about ten hens. Since sexes are born in equal numbers, it is easy to see how a surplus of gobblers can occur under this arrangement. After the hens are bred and no longer need the gobbler for mating, most of the gobblers could be harvested. Bag limit during the spring season in Texas is one gobbler per hunter; therefore, there is no danger of reducing the productivity of the flocks by harvesting gobblers each spring.

Should I try to restock turkey on my place?

Restocking is one of the most important factors in our turkey management program in Texas, but restocking efforts should not be made in areas that are

no longer suitable for the birds. Extensive land clearing practices have eliminated thousands of acres of good turkey habitat, and continuous overgrazing by domestic livestock has rendered additional thousands of acres worthless to the wild turkey. Successful restocking attempts have been made by the Texas Parks and Wildlife Department with turkey trapped from the wild. The trapped birds are immediately released into approved restocking areas and carefully protected for at least five years following their release. Wild turkey have the ability to survive and reproduce when relocated under such conditions. In most cases, releases of pen-raised or semidomesticated turkey into the wild have been unsuccessful and quite expensive. Releasing pen-raised birds into the wild may also invite serious disease and parasite problems unless done under carefully regulated conditions such as programs carried out by the Parks and Wildlife Department.

There are several factors which should be considered before turkey are restocked in an area. First, why aren't turkey there now? Is there sufficient vege-



Martin T. Fuller

tation to provide cover and food? Good turkey range should have ample numbers of mature trees as well as brush and shrubs to provide food (pecans, acorns, berries, seeds) as well as cover and roosting areas. Assuming the range provides all the natural essentials, the area must also be protected from illegal hunting such as roost shooting at night. *No one should be allowed to hunt, camp or otherwise disturb turkey within one-quarter mile of a roost site.* Finally, turkey require a large annual range, often moving eight to 10 miles from winter roost sites to summer nesting areas. Food, cover and protection must, therefore, be provided over an area of several thousand acres. If an area can provide all these essentials and is within the required rainfall belt, then serious consideration might be given the possibility of restocking turkey.

Do turkey need supplemental feed?

Supplemental feeding of any wild animal is recommended only during extended periods of stress such as prolonged drought or severe winter weather. However, in order to sustain wildlife during these



critical periods, the animals must know where the supplemental feed is located and be accustomed to taking it. Therefore, feed should be provided well in advance of any anticipated critical periods. Often supplemental feed is provided just before and during hunting seasons in order to "bait" turkey to a specific site to be harvested by eager hunters. It is essential that such a feeding program be continued into January and February if turkey are going to benefit from it. Turkey prefer natural food and will not take significant quantities of artificial feed unless they really need it. In most cases, it is preferable to improve or extend the turkey's natural habitat and food supply.

Although extended periods of severe weather may justify supplemental feeding in some instances, feeding programs are expensive. Feeding areas should be kept clean and the grain must not become contaminated by the birds' droppings. For this reason, feeders should be moved short distances from time to time. The feeding area should be near trees and thick brush to provide immediate escape cover from predators.

Food plots are preferable to feeding stations for turkey and other wildlife. These plots need not be large in size; two to 10 acres will provide large quantities of forage for turkey and other wildlife if it is not grazed by domestic livestock. Turkey readily eat oats, wheat, clover, vetch or rye.

Biologists in Texas and other states have worked years to obtain answers to some of the many questions which arise concerning the restoration and management of the wild turkey. Our society continues to demand more fields for food crops; more livestock to provide meat and other products; more lakes for recreational activities; and more land for homes, schools, factories and roads. These demands may spell eventual doom for the wild turkey unless large tracts of land are preserved as wildlife habitat. Continuing research will hopefully provide the management techniques which will ensure the survival of the wild turkey in Texas. **

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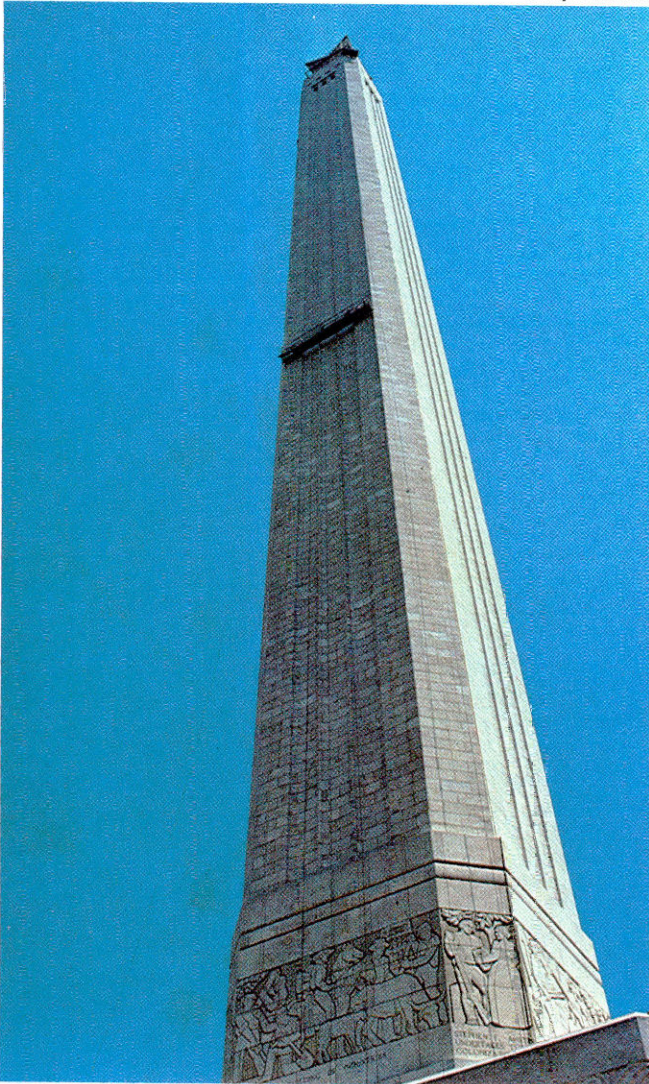
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Could You Work Up There?

From the ground, San Jacinto Monument is awe-inspiring, but for a construction worker 570 feet in the air, it may produce quite different emotions.

by Ilo Hiller

Restoration work has now been completed on the octagonal shaft of the historic San Jacinto Monument and the 34-foot star which tops it.

This structure, known as the world's tallest masonry monument, rises 570 feet above the San Jacinto Battlefield and is located adjacent to the Houston Ship Channel near Deer Park. It was erected to pay tribute to the men who died in this decisive battle to win independence for Texas from Mexico, and was constructed of concrete faced with Texas Cordova shellstone.

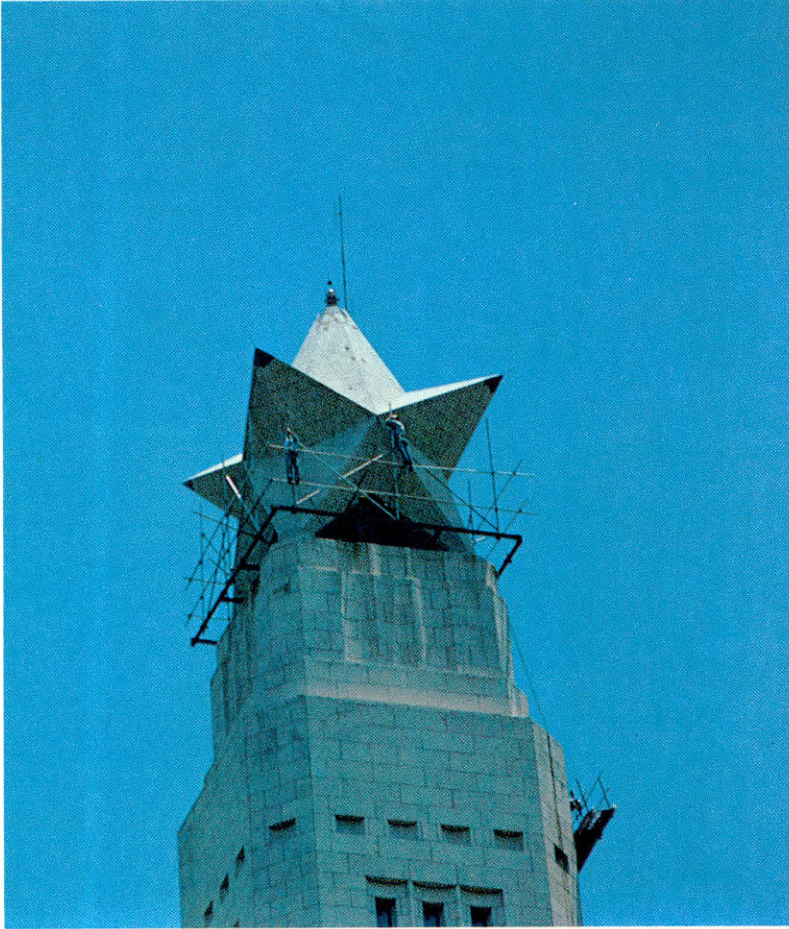
The awesome restoration task was accomplished by Swain Restoration Company of Houston and included the cleaning of some 110,000 square feet of shaft, removal of all broken shellstone, restoration and replacement of shellstone, restriping of joints between stones, waterproofing of the shaft's exterior and injection of waterproofing gel around the base of the shaft where it joins the museum roof.

This may not sound too difficult at first, but when you consider that all of the cleaning and restoration equipment, electrical power and workmen had to be hoisted foot by foot up each side of the towering shaft, a distance equivalent to the approximate height of a 55-story building, the task takes on a new perspective.

Winds also increased the hazards for workmen. Gusts of 50 to 60 miles per hour were not uncommon at the top of the shaft on days when the weather appeared relatively calm on the ground. At times, the



Paul Swain



Working 570 feet above the ground has its problems. To accomplish some of the tasks, it was necessary for a workman to descend from the top of the structure in a bosun chair supported by a stainless steel cable (bottom, extreme left). The construction platform of steel and aluminum (left) was built to enclose the star and enable workmen to safely restore the points which extend beyond the top of the shaft. Safety nets capable of sustaining 10,000 pounds were attached beneath the star.

men and their suspended working platforms were blown five or six feet away from the stone surface and then slammed back against it.

Cleaning and restoring the star presented its own unique problems. How would you attempt to work on the points of a 34-foot star mounted on a shaft that tapers to an area 19 feet square at the base of the star? There's a lot of empty space under those star points and it's a long way to the ground.

The restoration company solved the problem by rigging a steel-beam platform directly under the star from which an aluminum superstructure could be constructed to enclose the entire star. Workmen above and below carefully controlled the manipulation of the ends of the beams with guy ropes as a power stage hoisted them up the shaft. Another workman, descending from the star in a bosun chair supported by a stainless steel cable, raised the beams the remaining distance and positioned them properly beneath the star.

Aluminum framing constructed on the beams gave the star the appearance of an encapsulated space module, but when it was completed, the workmen were able to safely perform the needed repairs. As an added safety factor, nets capable of sustaining 10,000 pounds were attached beneath the star.

When the star was originally constructed, I-beams were cantilevered out the observatory windows some 70 feet below to provide a work platform. By rigging

directly under the star, Swain Restoration Company not only saved the state money, but also allowed monument visitors to have uninterrupted use of the observatory during the time repairs were being made.

Once the shaft had been cleaned with steam under high pressure, electric tools were used to remove the broken pieces of shellstone. Some 5,000 feet of electrical cables supplied the necessary power.

Stone used for the restoration work was obtained from quarries near Austin and was carefully color matched to samples from the monument. Areas smaller than 10 inches in size were patched with a crushed shellstone mortar, but larger areas were filled with newly cut stones. Light restoration was also made to the stone-carved, 15-foot mural portraying the history of Texas. This stone carving is located around the shaft about 90 feet above the ground.

An inorganic sterate was used as a grout for re-striping and waterproofing all of the stone joints. It was also used to close up cracks caused by settled ground.

When the work was completed, a low pressure application of waterproofing material was made to the surface of the shaft, and a polymer water gel was injected under 65 pounds of pressure around the base of the shaft.

As a result of this general face-lifting, future visitors to the San Jacinto Monument will be better able to enjoy its beauty.

**





Ringnecks in the Ricelands

by David Reid, Wildlife Biologist, Bay City

Along the Gulf Coast in the open rice land of Matagorda and Jackson counties, the ring-necked pheasant is being stocked in an effort to establish it as a new game bird in Texas.

Pheasants being released in these counties are flown from the Sacramento Valley in California where they are trapped in the wild. This area of California was once stocked with pheasants just as the counties along the Texas coast are being stocked now.

These Gulf Coast counties were previously open grassland but, during the last couple of decades, rice farming has intensified and native pasture land has been replaced by open rice fields and rice canals. Thus, the rice farming industry has destroyed much of the natural habitat of the native bobwhite quail. The pheasant, unlike the bobwhite, requires very little woody cover and thrives on the open land.

Detailed ecological studies were first made of the game-deficient area and then plans were made to transplant a game species from a similar habitat and climate in another state or country. "Hit or miss"



Past records indicate that pheasants may remain near the site of their release or scatter as far away as 10 miles.

releases have proved to be disastrous in many parts of the world so it was only after careful study of various game species that the transplant programs were initiated.

Pheasants were first released in Matagorda and Jackson counties in 1964. During the past seven years, about 1,541 wild-trapped pheasants and 1,086 pen-raised pheasants have been released in the two counties. The most recent pheasant release was made in 1974 when Matagorda County received about 98 birds.

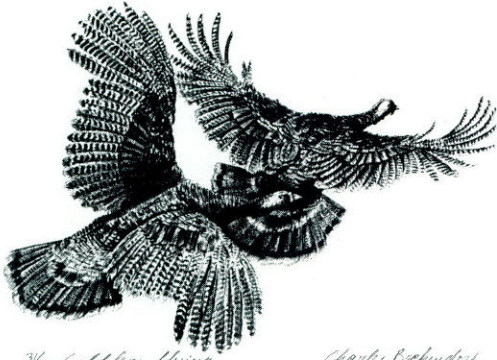
Pen-raised pheasant releases have been discontinued as it is not necessary to saturate the area with as many wild-trapped birds as it is with the pen-raised pheasants. Today's problem is that sometimes these wild-trapped birds scatter to such an extent that reproduction seldom occurs.

Pheasant reproduction in Matagorda County was very limited from 1964 to 1966 but in 1967 more broods were observed than in previous years. From 1968 to 1974, pheasants were censused and brood count data taken. An increase in pheasant numbers was noted each year. At the present time, there are two areas

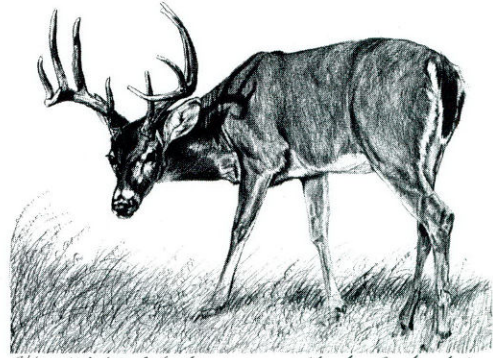
in Matagorda County with good pheasant populations. However, very few birds are seen in adjacent areas with identical habitats. Jackson County pheasant populations seem to remain constant with limited reproduction but a new area was stocked in 1970 and 1971 to help establish the pheasant in the county. Pheasant data collected in the new release area indicates that reproduction is occurring.

All pheasants are banded before release. Band recovery data have shown that while some pheasants have remained at the site of their release, others have scattered as far away as 10 miles. It has been noted that pheasants choose a certain area and remain there, although an adjoining habitat may be identical. Also noted was the fact that pheasants seem to prefer a native-type pasture and go to maize and rice fields to feed. The challenge of producing abundant game on all Texas land is the goal of many conservationists working with Texas wildlife. It is hoped that in the future the pheasant will be able to maintain itself and become a new game bird in areas no longer suitable for native species. **

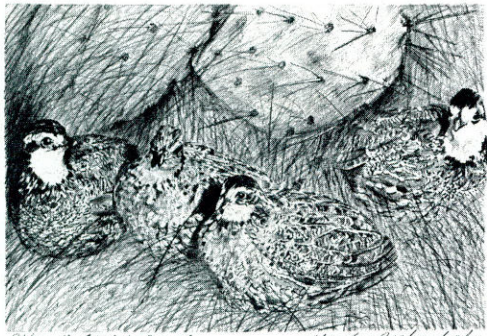
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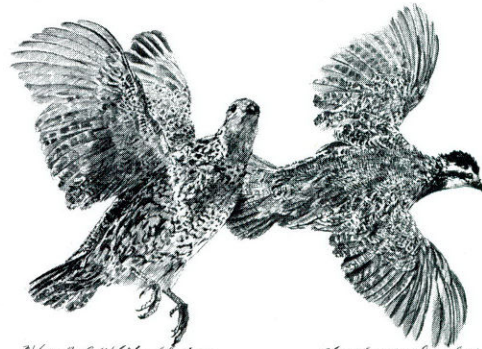
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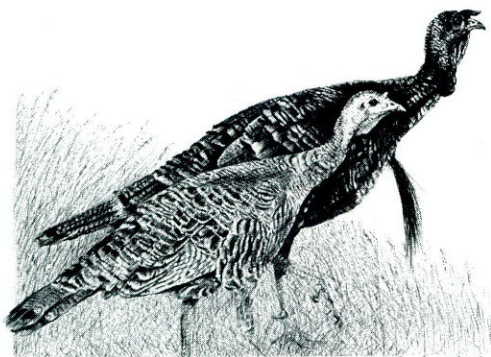
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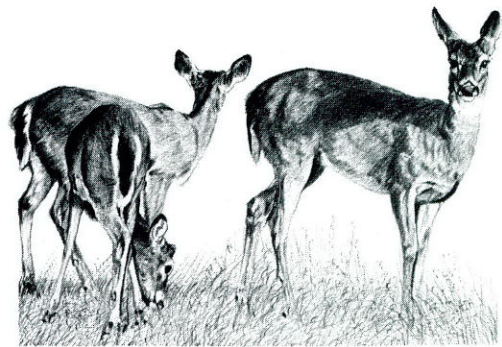
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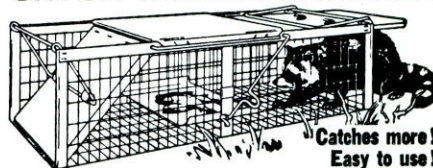
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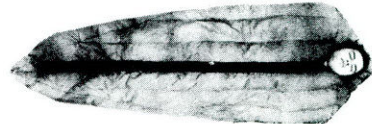
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I certify that I am not now and never have been a member of any organization which has as any part of its program the attempt to overthrow the government of the United States by force or violence; that I have never been convicted of a crime of violence; and that if admitted to membership in the Texas State Rifle Association I will fulfill the obligations of good sportsmanship, and uphold the Constitution of the United States and the Second Amendment thereto.

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(Your ZIP Code is an essential part of your address. Without it, your application cannot be processed.)

Every year, each member receives the famous "Snortin' Bull" decal with his Membership Card, and quarterly, the Association's Bulletin, the TSRA Sportsman, containing timely information on the latest hunting regulations, game limits and seasons, legislative information, and vital aspects of the shooting sports at national, state, and local level. To assure the accuracy and timeliness of information, TSRA subscribes to the Texas Legislative Bulletin Service and maintains direct liaison with the Texas Legislature, the Texas District and County Attorney's Association, the Texas Criminal Justice Council, and the Texas Parks and Wildlife Department. As required, TSRA publishes special bulletins of interest to its members. Over 70,000 such bulletins were mailed concerning legislation before the 62nd Texas Legislature.

Additionally, TSRA encourages and sponsors junior training programs, hunter safety programs, home firearms safety, competitive marksmanship, state championships, and selects teams to represent the State of Texas at the annual National Championships. Annual dues are \$4.00, and memberships run from Jan. through the following Dec. 31st each year. We urge you to join your fellow Texans and become a member of this honorable Association. You'll be glad you did!

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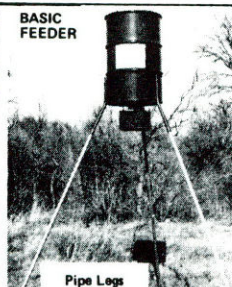
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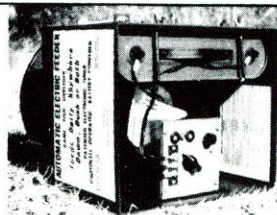
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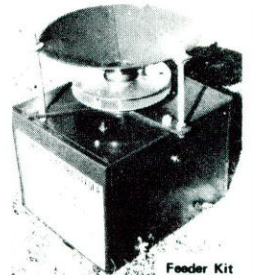
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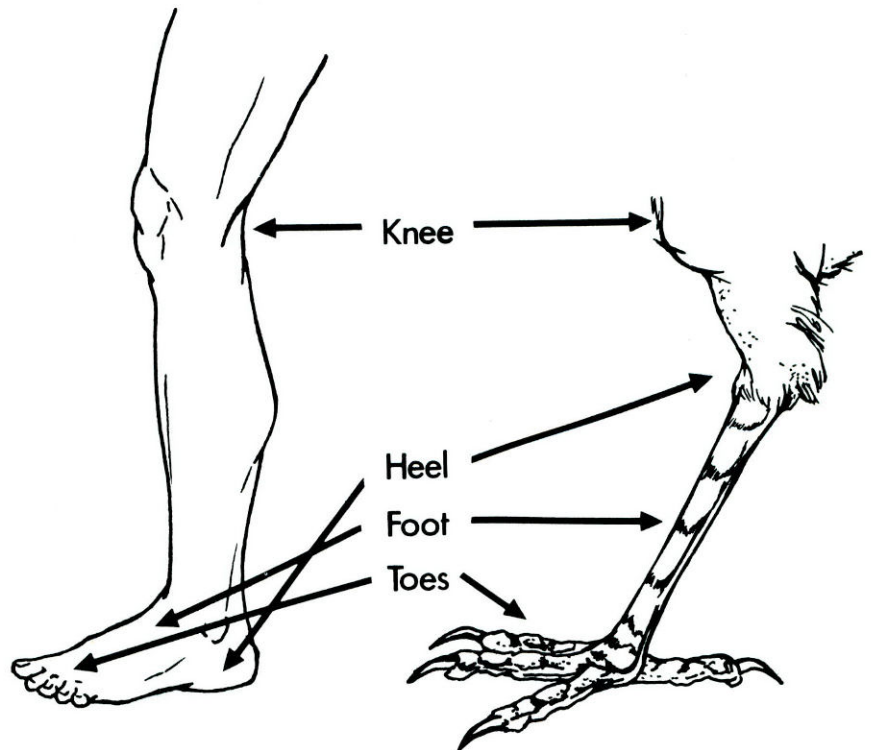
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Bird Feet



by Ilo Hiller

We humans all have feet, and they are basically alike. However, in the bird world, feet are uniquely different.

Birds walk on their toes, and what most people believe to be the leg is actually a long foot. People think the ankle joint is the knee although it bends in the wrong direction. The real knee is hidden in the bird's feathers.

Since birds are either scratchers, climbers, waders, swimmers, perchers, hunters, or a combination of these, the size and shape of their feet are different as are the number and location of their toes.

No bird has more than four toes on each foot, some have three and the ostrich has only two. To understand the location of these toes as we discuss them, imagine them as the thumb and first three fingers of your hand. We'll call the thumb the first toe, the index finger the second toe, the middle finger

the third toe and the remaining finger the fourth toe. Pretend the little finger is missing.

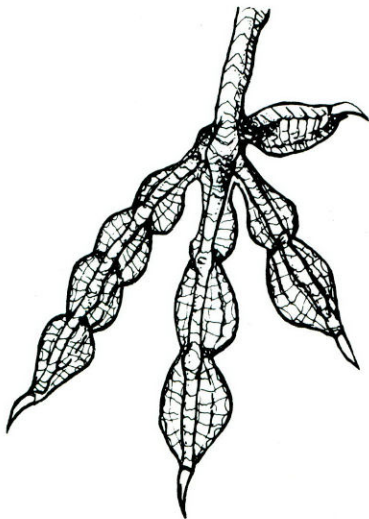
Some birds such as the swifts have all four of their toes pointing forward to help them climb vertically and cling to their nests, but most birds have three toes pointing forward (toes two, three and four) and one toe pointing backwards (toe one). This arrangement not only provides good balance for the bird, but it enables perching birds to firmly grasp a tree branch.

Owls and osprey have the basic arrangement of three toes forward and one toe backwards, but these birds are also able to turn the fourth toe backwards to give them two gripping toes on the back (toes one and four). Since they are both predatory birds, this reversible toe helps them grip their prey more easily. Nature has also provided the fish-eating osprey with spiny foot

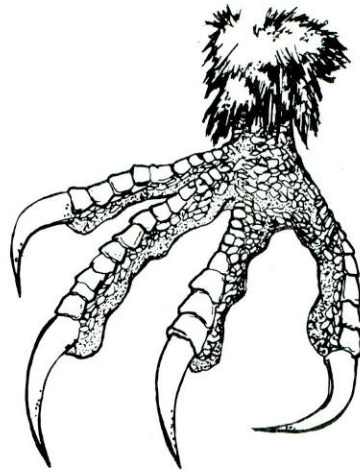
pads to help it hold the slippery fish it catches.

Cuckoos and woodpeckers are among those birds which have "yoke-toed" feet. Their toes are permanently paired with two in front (toes two and three) and two in back (toes one and four). This arrangement and their sharp claws enable them to climb without difficulty. The feet also brace the woodpecker as it hammers away with its beak.

Position and size of a bird's back toe (toe one) depend largely upon the importance of this toe for perching or seizing prey. Since this toe is of little importance to many running, walking and swimming birds, it is often quite small and may even be raised so that it doesn't touch the ground. In some species, such as the killdeer, the first toe has completely disappeared, leaving the bird with only three toes (toes



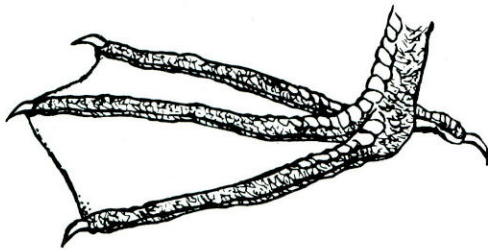
Coot (lobed swimming foot)



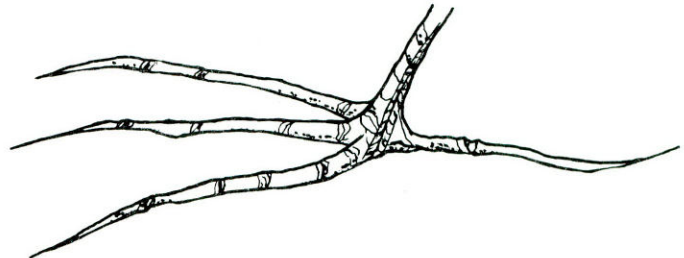
Eagle (preying foot)



Woodpecker (yoke-toed climbing foot)



Mallard (webbed swimming foot)



Jacana (wading foot)

two, three and four).

Length, shape and strength of the toes and claws depend upon where and how the feet are used. Perchers have highly developed, flexible toes to give them a firm grip on tree branches. Climbers not only have strong toes, but they also have sharp claws to grip the bark as they travel up and down tree trunks or hang upside down while exploring the undersides of branches.

Turkeys, pheasants and quail use their feet to scratch among the leaves and dirt for food, so their strong toes have short, thick, blunt claws. Sharp claws would soon be dulled by scratching and long ones would quickly break, so these birds are properly equipped for scratching for food.

Birds of prey, such as the eagle, have very strong toes which are widely spread and equipped with long, sharp, curved claws. This type of foot has great grasping and holding power. Once the eagle's toes have grasped an object and clutched it tight, nothing short of cutting off the bird's leg will

loosen the grip of these strong toes until the eagle wants to let go.

Vultures, which feed on dead animals, have a weaker type of foot more suitable for walking and perching. The muscles are weaker and the claws are shorter and more blunt. There is very little gripping power in the toes since the vulture doesn't need to seize and hold live prey.

Wading birds must often walk on soft ground, so their feet are suitable for this. Some have long toes and claws to distribute their weight over a large surface area and keep them from sinking into the mud. The jacanas, also called lily-trotters, are an extreme example of this. They have very long, thin toes equipped with long claws, especially the back toe (toe one). With these feet, jacanas can walk on floating plants without sinking to get to feeding areas that are too deep for wading birds and too full of vegetation for swimming birds.

Some wading birds have extremely long foot and leg bones which make

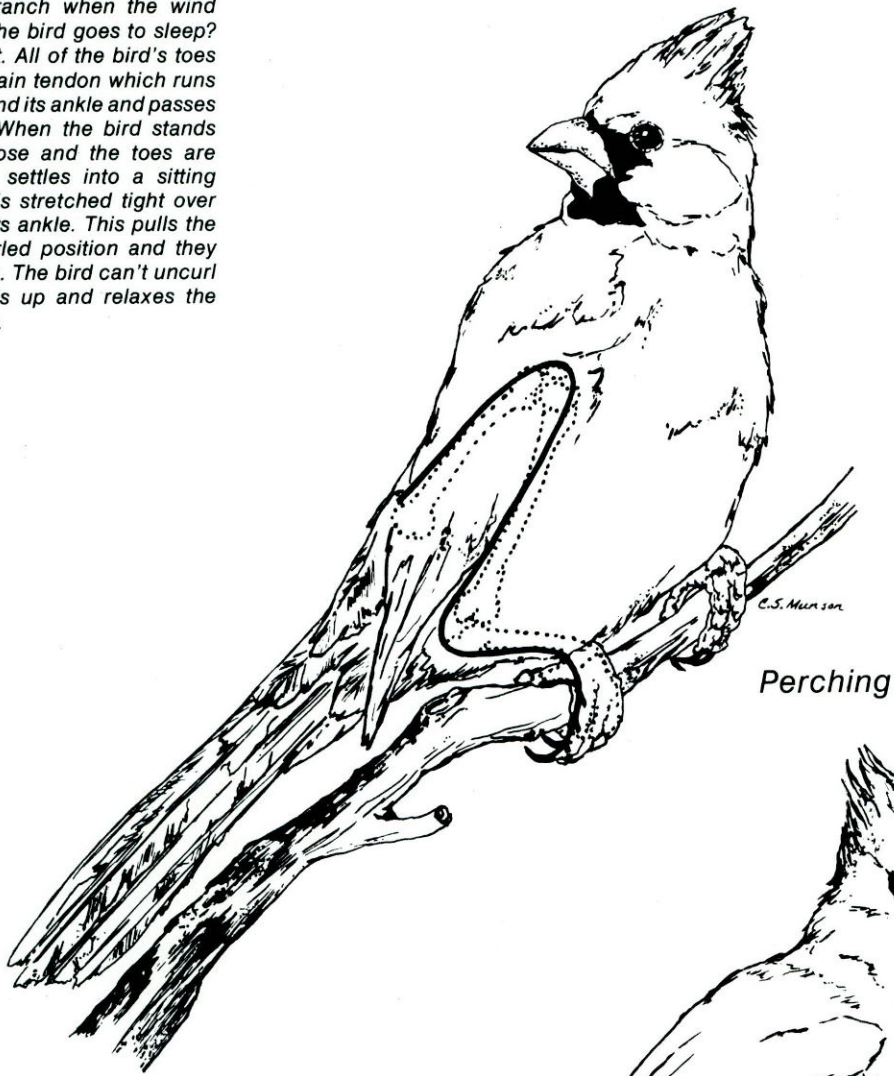
them look as if they are walking on stilts. These long bones enable the birds to wade in shallow water areas to feed without getting their bodies wet or being knocked down by incoming waves.

Ducks, geese, gulls and many other swimming birds have webbing between their toes. Usually only the three forward toes are webbed (toes two, three and four), and the rear toe (toe one) is quite small and poorly developed.

Some swimmers, such as the coots and grebes, have developed toe flaps or lobes instead of true webbing. These flaps appear on the sides of each toe. As the foot moves forward in the water, the flaps fold in against the sides of the toes to reduce water drag. On the powerful backward stroke, the flaps flatten out against the water to provide a weblike surface.

Different though they may be, each bird's feet have adapted to meet its own particular needs whether it walks, runs, perches, scratches, climbs, wades, swims or hunts. **

Have you ever wondered why a perching bird doesn't fall off its branch when the wind blows hard or when the bird goes to sleep? The reason is, it can't. All of the bird's toes are connected to a main tendon which runs up its foot, bends behind its ankle and passes in front of its knee. When the bird stands up, the tendon is loose and the toes are relaxed. As the bird settles into a sitting position, the tendon is stretched tight over its knee and behind its ankle. This pulls the bird's toes into a curled position and they tightly grip the branch. The bird can't uncurl its toes until it stands up and relaxes the tendon's pull on them.



Perching



Standing

LETTERS TO THE EDITOR

Catalpa Trees & Worms

Where can I buy a catalpa tree (with worms, of course), what care is needed and how do I keep the birds out of my bait?

Charles E. Barry
Houston

The catalpa tree, *Catalpa speciosa*, is a native to East Texas, and is also known as the cigar-tree. It is popular as an ornamental and can be purchased from many nurseries. However, it does not come complete with worms.

Catalpa worms are actually the larval or caterpillar stage of the catalpa sphinx moth, *Ceratomia catalpae*. The moth lays her eggs on the leaves, and when the caterpillars hatch, they gorge themselves on the tree's heart-shaped leaves. When fully grown, they burrow into the ground, change into the pupa stage and finally emerge as moths. Three or four generations may appear during the summer months, but if autumn finds the caterpillars still on the tree, they burrow into the ground beneath the tree, remain there in a dormant state throughout the winter and

emerge as moths in the spring to start the cycle again.

A combination of black, white and chartreuse, the caterpillar averages about three inches in length. It has an ominous looking black horn on its tail, but is not equipped with any stinging device and can be considered harmless. Its skin is so tough that even the smallest bit hangs to the fishhook, making it excellent bait. Each worm can be divided into thirds for baiting purposes.

As to how you can keep the birds away from your bait, you will probably have to rely on the caterpillar's protective coloration and hope for survival of the fittest.

Oyster Care

Several members of my family and I are in disagreement on the preparation of fresh oysters for eating. The question is, "Should oysters be washed before they are eaten, either raw or cooked?"

Dale Bransford
San Antonio

We are told by our seafood marketing personnel that commercially shucked oysters need not be washed before they are eaten, either raw or cooked, as they are rinsed to remove grit and shell particles when they are shucked. Rinsing them again will only remove the liquor (the natural juices) which have accumulated since packaging.

Freshly gathered oysters will remain alive in the shell for two or three days without refrigeration if they are kept cool and moist. Place them in a moist, burlap bag and keep the bag in a cool room or a cool, shaded area. Once the oysters are opened, the meat should be chilled to below 35 degrees F. immediately. Rinsing them first in ice water will remove any grit or shell particles and start the chilling faster. It will also ensure that the oysters in the middle of the container do not retain heat while those around the outside are chilling. Oysters will keep in this condition for about a week, but for best quality and freshness, they should be frozen as quickly as possible after shucking.

The instructions for freezing are simple. (1) Wash shells thoroughly before opening to remove mud and grit. (2) Open shells and place removed meat in a strainer. Save oyster liquids if desired. (3) Rinse oysters in ice water or a cool 2½ percent salt solution (approximately three teaspoons of salt to one quart of water) to remove any loose particles of shell or grit. (4) Place family-sized portions in freezer containers and cover oysters with a cool 2½ percent salt solution or the natural liquid saved from the oysters. (5) Label containers and freeze oysters immediately.

It is illegal to take oysters from other than Health Department approved waters. Oysters from unapproved areas may be contaminated, and washing will not remove their internal bacteria.

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BACK COVERS

Outside: Viewed by day or night, the 570-foot tall San Jacinto Monument is a glowing tribute to the men who died on this battleground in 1836 to win Texas' independence from Mexico. Photo by Jim Whitcomb.
Inside: Unusual beauty can be found in the winter abstracts of nature, such as this ice-covered spider web, but it must be captured on film as it cannot survive the warmth of the noonday sun. Photo by Bill Reaves.



