

TEXAS

PARKS & WILDLIFE



November 1977 • 50¢



DOLPH BRISCOE
Governor of Texas

**PARKS AND WILDLIFE
COMMISSION**

PEARCE JOHNSON, Chairman Austin
JOE K. FULTON, Vice-chairman ... Lubbock
PERRY R. BASS Fort Worth
JOHN M. GREEN Beaumont
JAMES R. PAXTON Palestine
LOUIS H. STUMBERG San Antonio

**PARKS AND WILDLIFE
DEPARTMENT**

HENRY BURKETT Executive Director

DIRECTORS

BILL ANDERSON Data Processing
JOHNNY L. BUCK Design & Construction
TED CLARK Wildlife
JAMES E. DICKINSON Finance
DEXTER C. HARRIS Law Enforcement
ROBERT J. KEMP Jr. Fisheries
PAUL E. SCHLIMPER Parks
PERRY SPALDING Administration

**TEXAS PARKS & WILDLIFE
magazine**

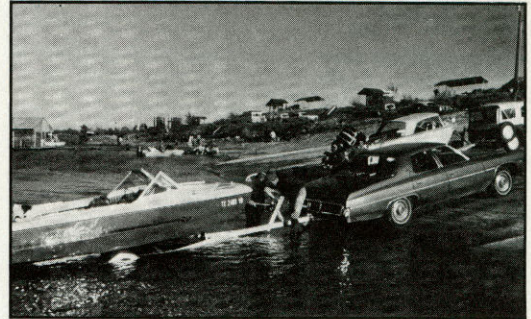
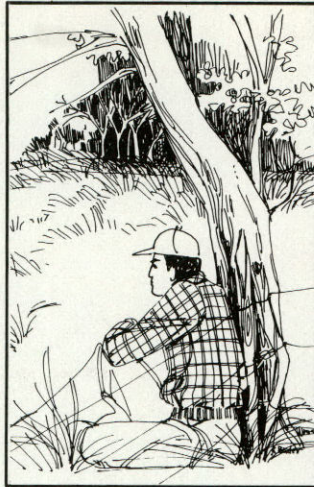
Dedicated to the conservation and enjoyment
of Texas fish, game, parks, waters and all
outdoors.

JOHN JEFFERSON Director, Information
and Education
DAVID BAXTER Editor
ILO HILLER Associate Editor
DIANNE RICHARDS Art Editor
BILL REAVES Photography Editor
RUTH PERRY Advertising-Circulation
LAVERNE MOCCIA Office Manager

Published monthly by the Texas Parks and
Wildlife Department, 4200 Smith School
Road, Austin, Texas 78744, AC 512
475-4891. Reproduction of material is not
permitted except by special written permis-
sion. The inclusion of advertising is consid-
ered a service to subscribers and is not an
endorsement of products nor concurrence
with advertising claims. Rate schedule avail-
able upon request. Subscription rates: \$5 for
one year and \$9 for two years. Single copies
and all back issues, 52¢. Foreign subscrip-
tion rates: \$6 for one year and \$11 for two
years.

Postmaster: If undeliverable, please send
notices by form 3579 to 4200 Smith School
Road, Austin, Texas 78744, Second class
postage paid at Austin, Texas, with addi-
tional entry at Oklahoma City, Oklahoma.

Publication Number 541360



TEXAS PARKS & WILDLIFE

November 1977, Vol. XXXV, No. 11

- Wild Game Comeback** by Horace Gore 2
Game species have increased through sound wildlife management efforts.
- So You Believe It** by Ernest Marsh 6
Many deer hunters' beliefs have no basis in fact.
- Improved Habitat Means Better Fishing** by Allen Forshage and Tom D. Bonn 8
Fish attractors, properly placed, concentrate fish for angler harvest.
- Too Many Starlings** by Fred S. Guthery 12
Sanitation and depredation problems arise when large flocks of starlings congregate.
- Airboats Take Them Where They Need to Go**
by L.D. Nuckles 14
Law enforcement effectiveness has increased as wardens gain access to shallow-water areas.
- Sandhill Challenge** by J. D. Peer 16
High-flying, fast-moving cranes test the hunters' skill.
- Around the State** 20
News briefs compiled by the department's news service.
- A Gift of Land** by Mike Herring 22
Donations from individuals and private industry have added thousands of acres to the state park system.
- Young Naturalist: Hermit Crab** by Ilo Hiller 30
Learn about this interesting beach creature in its borrowed shell.
- Letters to the Editor** 32

Front Cover: The sparrow hawk, or kestrel, *Falco sparverius*, is the only small hawk with a rufous back or tail. Photo by Perry Shankle Jr.

Inside Front: Its soft, unprotected rear forces the hermit crab to spend its life in the borrowed shells of other marine creatures. Photo by Bill Reaves.



Wild Game Comeback

Sound Wildlife Management has restored game populations throughout the state.

by Horace Gore, Upland Game Program Leader

Game populations in Texas have gone from a time of plenty during the 19th century to one of shortages in the early part of the 20th century and back to relative abundance in the past 36 years.

Official state records dating back to 1852 indicate that wild game in Texas was at that time abundant. However, by 1884, the State Fish Commissioner sounded a warning in his annual report of a growing shortage of both game and fish in all areas of the state except South Texas. Protection seemed to be the key to wildlife abundance.

The first special game law for Galveston Island was passed in 1860, and the first general game law was passed in 1879. But little heed was paid to any game and fish laws until 1923 when the warden force was increased from six to 45 and special emphasis was given to wildlife protection. At that time, little or no thought was given to the biological aspect of a species or its habitat.

Although agricultural economics have played a tremendous role in the status of game animals today, wildlife economics also must be credited with increasing game populations. Demands for hunting opportunities, which are directly associated with department programs to provide broodstock and protection, brought about a sense of wildlife values far above the aesthetic. The shooting preserve law was passed in 1925 without fanfare, but this legislation had a profound effect on deer and turkey populations. By giving the landowner an opportunity to gain some economic benefit from the wildlife ranging on his property through leasing rights, it prompted him to protect broodstock from overharvest.

A comparison between early re-

ports and recent data on game populations and annual harvest shows most game species have increased in Texas since 1930.

White-tailed deer have been increased through trapping and transplanting, education of the public and protection programs designed to promote both population expansion and harvest.

Under department-approved programs, more than 26,000 whitetails have been trapped from areas of surplus and moved to areas of suitable range lacking adequate broodstock.

Rio Grande turkey numbered less than 100,000 in 1928. Today, after more than 10,000 birds have been trapped and transplanted to other

parts of the state, Texas leads the nation with its wild turkey population of 400,000 birds.

The eastern turkey had been virtually extirpated from East Texas by 1945, when only an estimated 100 birds were reported. Restocking programs involving some 1,700 birds have helped to restore this species. In fact, the first spring turkey season in East Texas since 1941 was held in two counties in 1977, the direct result of department restocking programs.

Mule deer range has been expanded in the Panhandle and Caprock areas of the Rolling Plains by trapping and transplanting.

Antelope populations were extremely low prior to the initiation of



Bill Reaves

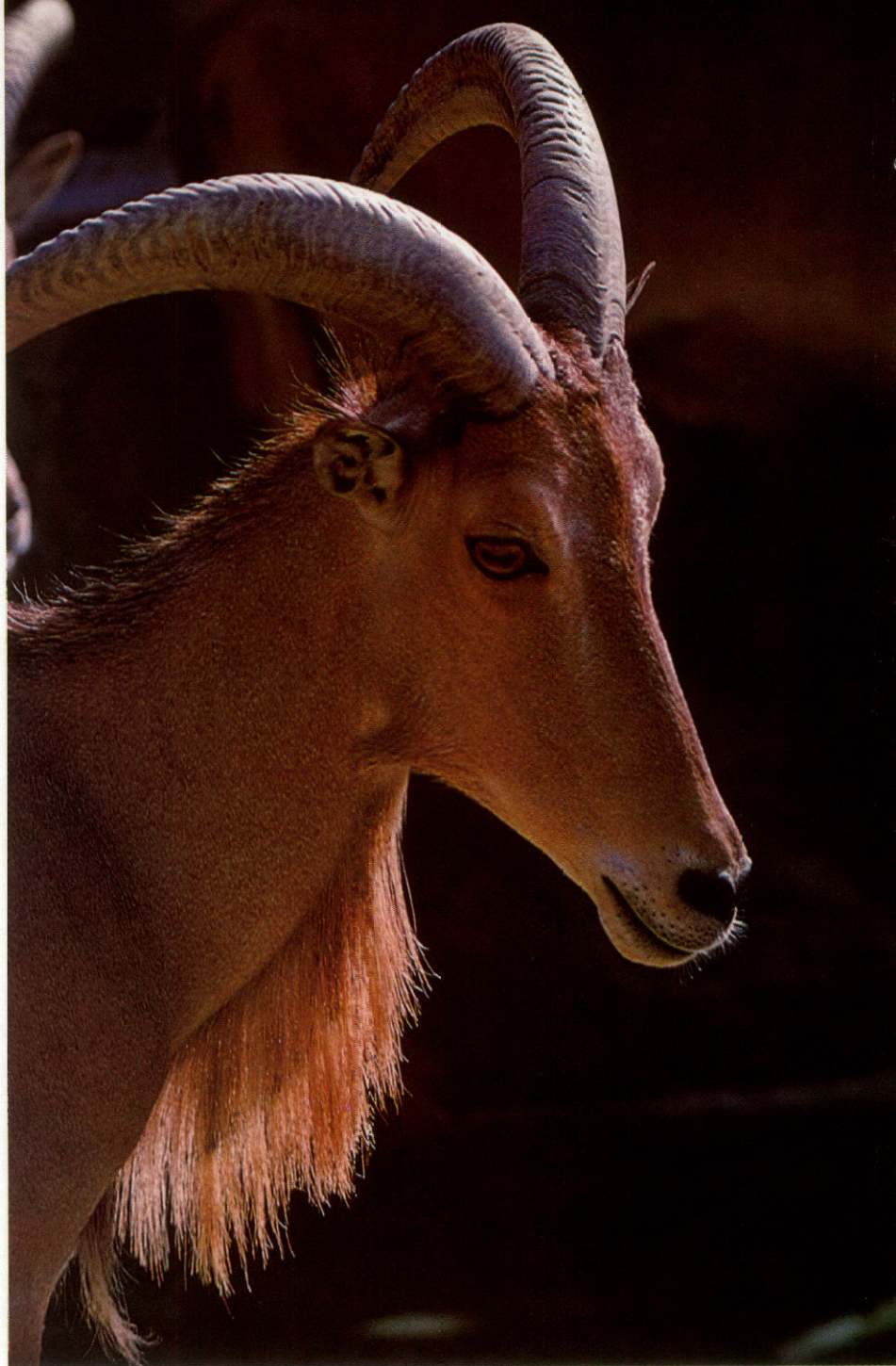
a trapping and transplanting program in 1939. As many as 1,651 animals were relocated during the five-year period from 1939 to 1944, and several hundred have been trapped and moved since that time (1,131 in 1974-75). Educational programs, strict law enforcement and stringent controls on hunting have increased the antelope population to a total of 14,000 animals in the Trans-Pecos and Panhandle.

The aoudad sheep, an exotic game mammal from Africa, was successfully stocked in the Palo Duro Canyon in 1958. This animal is a prized trophy for the hunter who has the stamina to hunt in the rough terrain it inhabits.

Beaver were rare in Texas in 1928. Today, they are common in areas where broodstock was introduced under department programs.

Ring-necked pheasants were almost nonexistent in Texas in the early 1930s. Pheasants became established in the irrigated farmlands of the Texas Panhandle as they naturally drifted in from Colorado, Kansas and Oklahoma. In 1976, some 24,000 birds were harvested. Texas also had its first pheasant season in the Gulf Prairies in 1976 — the result of transplanting pheasants into the rice farmlands of Liberty, Matagorda and other counties in the Gulf Prairie. Since 1964, 37,500 pheasants have been released in a variety of habitats in Texas. An aggressive department program continues to expand pheasant range in suitable agricultural areas.

Outstanding wildlife research



Bill Reaves

programs have given new insight into the effects of diseases on wild populations of deer, bighorn sheep and mourning doves. Field research has enabled us to extend seasons on specific game birds and animals. The quail season has been doubled, a spring turkey season has been initiated in some 45 counties, a special teal season has been established and the white-tailed deer season has been extended to some 47 days with an increase in bag limit in some areas from two to three deer. Research has shown that both sexes of

white-tailed deer should be properly harvested. Since 1953, over one million antlerless deer have been taken by permit over a large portion of the deer range.

In essence, Texas wildlife went from a time of plenty (1825 to 1900) to a time of shortage (1900 to 1940) to a gradual renewal of plenty (1940 to 1976). The record shows that a major part of the success of game restoration can be directly attributed to the efforts of wildlife programs carried out by this department. **



Population Estimates

	1928	1976
White-tailed deer	108,000	3,225,000
Mule deer	20,000	220,000
Wild turkey	95,500	400,000
Antelope	2,400	14,000
Javelina	Numerous (South Texas)	Numerous (South Texas)
Aoudad sheep	None	1,500 (Palo Duro Canyon)
Bighorn sheep	100	40
Beaver	Rare	Common
Pheasant	None	Common (Panhandle) Huntable (Gulf Coast)

Texas wildlife is some of the best and most abundant in the United States. White-tailed deer, page two, have increased more than 30 fold in the past 48 years. Ring-necked pheasants, page three, now are major game birds in the Panhandle and rapidly becoming established on the Texas coast. Less than 20 years ago there were no aoudad in Texas to speak of; now the North African imports, page four, are prized trophies. Rio Grande turkey populations, above, are more numerous here than any other state. Eastern turkeys also are making a comeback and the first legal hunt of the birds was held this spring.

So You Believe It...

Deer Hunting Myths Debunked

by Ernest Marsh



Deer season is just around the corner and conversations about hunting plans and deer behavior are gradually taking over coffee breaks and other gossip periods. To add fuel to your debates, here are a few misconceptions that cause a lot of hunters extra work, disappointments and sometimes sorrow.

TRACKS

That huge deer track you sat by for several weekends last season, while seeing only does, was probably that of a doe rather than a buck. The size of a track can tell you something about how old and how heavy the animal is, but it tells nothing about sex. On the average Texas range where most of the older bucks are harvested each season, the older and heavier does will be making most of the large tracks because there simply are more big does than big bucks.

A study by biologists at the Engeling Wildlife Management Area in Anderson County revealed there

were no differences in foot size or nature of imprint that could be measured by sight. Based on hundreds of feet from harvested deer and from tracks made by observed deer, size was related primarily to body weight. No distinctive sex characteristics were found.

You can tell your friend, who swears he can tell buck tracks from doe tracks, that he's wrong. It cannot be done accurately. On the other hand, if you're depending on him to take you deer hunting, maybe you'd better skip it. Just listen to his interesting story, but sit only by large tracks made by a deer you actually saw and know is a buck.

RUTTING SEASON

A lot of hunters believe that the deer rutting season hits suddenly and then runs out about the middle of December. The truth is probably 90 percent of the does in Texas are bred before that time. Even so, almost anywhere you go you will find young does, or does suffering from

earlier stresses, reaching sexual maturity late in the season.

Intensive studies of many animal and plant species have revealed the start and finish of various activities most often is keyed to the length of daylight. However, in sexual activity, the incidence of activity is related to a later period of relative food abundance for the newborn young. Deer generally fit into this scheme of things, with some latitude because of the extremes in Texas. Does bred in October and November bear their fawns in May and June. These fawns have 30 to 45 bountiful spring days to get past infancy and reach the safety of some maturity before hot summer weather and poorer range conditions occur.

There are notable local exceptions to this average breeding pattern. Infrequent observations of newly born fawns following does in mid-January means some rutting takes place in June. Several upper-

coast counties consistently have fawns in late February, dating the conceptions in late July. At the other extreme, whitetails in some South Texas counties and mule deer in the Trans-Pecos normally have rutting peaks in December.

Don't stay home waiting for a blue norther to initiate rutting during the open season. You can be assured it's probably already in progress, if not past, and you can always depend on an early- or late-maturing doe to set the buck population afire if you're in the right place on a brisk day.

EYESIGHT

Deer are color-blind and do not associate color with danger. They depend on a keen sense of smell, sharp hearing and detection of movement to keep themselves out of trouble.

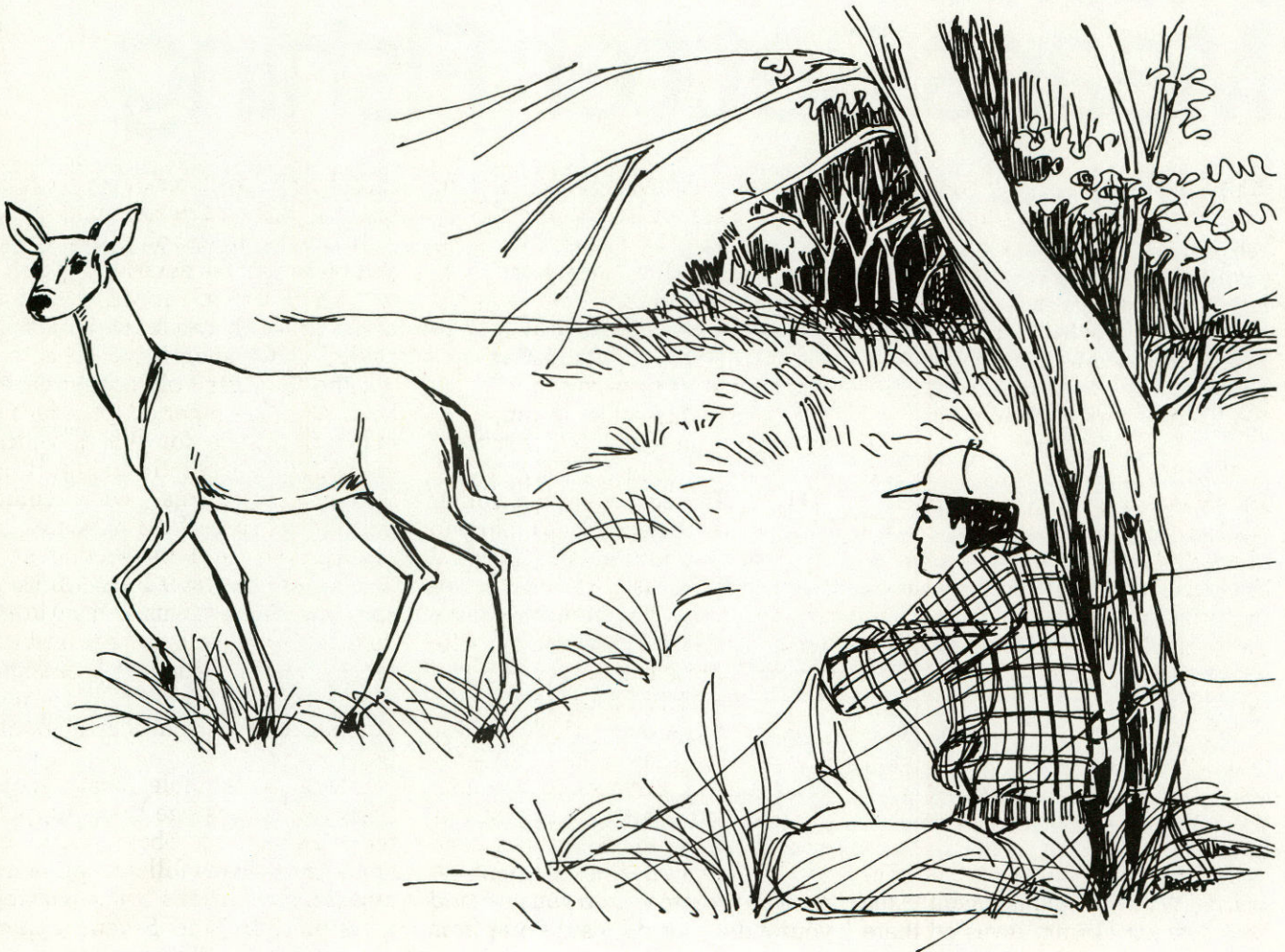
Because of these limitations, deer do not normally feed on dark, windy nights. They cannot see well.

The wind handicaps their ability to recognize and place noises and confuses their sense of smell. They feed often on still, moonlit nights because their ability to smell and hear offsets their limited sight.

Many studies and personal experiences lend credibility to this color-blindness. A hiker climbing a mountain slope, stopped to rest. He removed his bright yellow backpack, laid it flat on the ground and leaned himself against a large pine tree within three feet of the trail he had been following. Within a few minutes he saw a buck approaching on the same trail. He grabbed his camera and froze in position. The deer could not have missed seeing the poised hiker and the bright pack but without changing pace, it continued right on by, close enough to be touched. When the buck passed the hiker and encountered his scent in a following wind, the deer dashed up the mountain.

A biologist, waiting one evening for time to start walking a deer census line, sat on the ground and leaned up against a barbed-wire fence post. Shortly, a young doe came browsing along. She approached the fence within 10 feet of the man, calmly ducked under and continued browsing casually out of sight. With a brisk cross wind coming from the deer's side, the odor was never picked up and the deer was not alarmed. She paid no heed to the biologist's bright red cap and blue jeans.

All of this supports the issue, debated all too often, that you should always wear brightly colored clothes whenever you are in the woods hunting deer. Color distinguishes you from the deer, a distinction which could keep you alive. Some hunters have a disastrous habit of mistaking camouflaged fellow hunters for game, one of which could be you. **



Martin T. Fulfer



Improved Habitat Means Better Fishing

by Allen Forshage, Regional Director, Inland Fisheries and Tom D. Bonn, Management Biologist

For years, management of public reservoirs for the best possible sportfishing consisted of stocking these freshwater lakes with desirable game fish. This produced good fishing in new lakes but had little impact on older reservoirs. Now that fewer impoundments are being constructed, fisheries biologists must turn to other management techniques. One technique is improvement of fish habitat by using fish attractors.

Many Texas reservoirs lack sufficient natural cover to completely meet the habitat needs of sport fishes. Cover, in the form of trees, brush and rocks, is important because it provides an area where fish can hide from predators, rest, find food and, in some cases, spawn. Where natural cover is lacking, fish attractors are often a successful method of creating artificial fish habitat.

Attractors are not designed to replace all natural cover in a reservoir, as this would be too expensive and probably impossible in large reservoirs. Attractors are added primarily to concentrate fishes for angler harvest.

The idea of improving fish habitat by installing artificial cover is not new. For many years fishermen successfully have used various types of structures to concentrate fishes and increase their harvest. Since cover benefits both fish and fishermen, it's wise to provide shelter when natural cover is limited.

Construction, placement and site selection is very important. Well-meaning sportsmen may waste manpower, sup-

plies and money by random placement of shelters, without considering environmental surroundings. The following information will answer questions and help eliminate some problems encountered while planning, building and placing attractors.

Are there legal considerations which must be observed before placing fish attractors in public reservoirs?

Yes, there are a number of legal restrictions which include:

1. Permission to construct attractors in navigable waters or Corps of Engineers' lakes must be obtained from the U. S. Army Corps of Engineers. A letter should be submitted to the respective reservoir manager, accompanied by a complete plan including location, size and clearance above the attractor at mean low-water level.
2. If not a Corps of Engineers' reservoir, permission from the controlling authority or reservoir owner should be obtained.
3. Permission from adjacent, lake-front property owners should be sought as a courtesy to these individuals.
4. The attractor should not be placed in boat lanes or the main channel of the lake.
5. Attractors should be properly anchored five feet below the five-year drawdown elevation (the average low-water elevation over a five-year period) and clearly marked by buoys.
6. Attractors should not be installed near any intake or discharge structure for power plants, irrigation or municipal water supplies.



Tom D. Bonn

Why does a fish attractor concentrate fish?

1. Fish have a natural tendency to orient themselves by a solid object in water. Closely related to this is the attraction of fish to each other (schooling behavior).
2. Shelter provided by holes, ledges and dark corners creates hiding places from predators and rest areas.
3. Fish attractors provide additional underwater surfaces to which small organisms may attach. These organisms provide food for small fish, which in turn attract larger fish.
4. Fish attractors provide new habitat, which creates additional areas for fish that establish territories.
5. Some fish are attracted to artificial habitat for spawning.

What materials are used in the construction of fish attractors?

Major considerations for selection of fish attractor material are: availability and cost of material, ease of transportation, durability of material, buoyancy of the completed structure and manpower needed for construction.

Old tires, scrap lumber and brush are good attractor materials that do not require heavy equipment for placement. Old automobile bodies have been used, but the use of metallic materials in constructing fish attractors is not recommended since the metal deteriorates so rapidly. Concrete pipes, rubble and cement blocks have been used effectively, but are uncommon and not usually available.

How do you build a brush shelter?

The first step is selection of material. Any underbrush or tree can be used. Generally, brush growing closest to the lake is selected. Cedar or juniper trees make ideal attractors if available but cedars produce a resin which is thought to be

Stringers full of crappie and other gamefish are due in large part to good fish habitat. In reservoirs which lack adequate cover old tires and brush serve as fish attractors, places where fish congregate to feed, spawn or hide.

offensive to fish for several weeks after installation. However, a variety of sport fish have been observed near cedar fish attractors.

The next step is to bind the brush together with nylon rope or plastic banding and then sink it with rocks or concrete building blocks.

Do Christmas trees make good fish attractor building material?

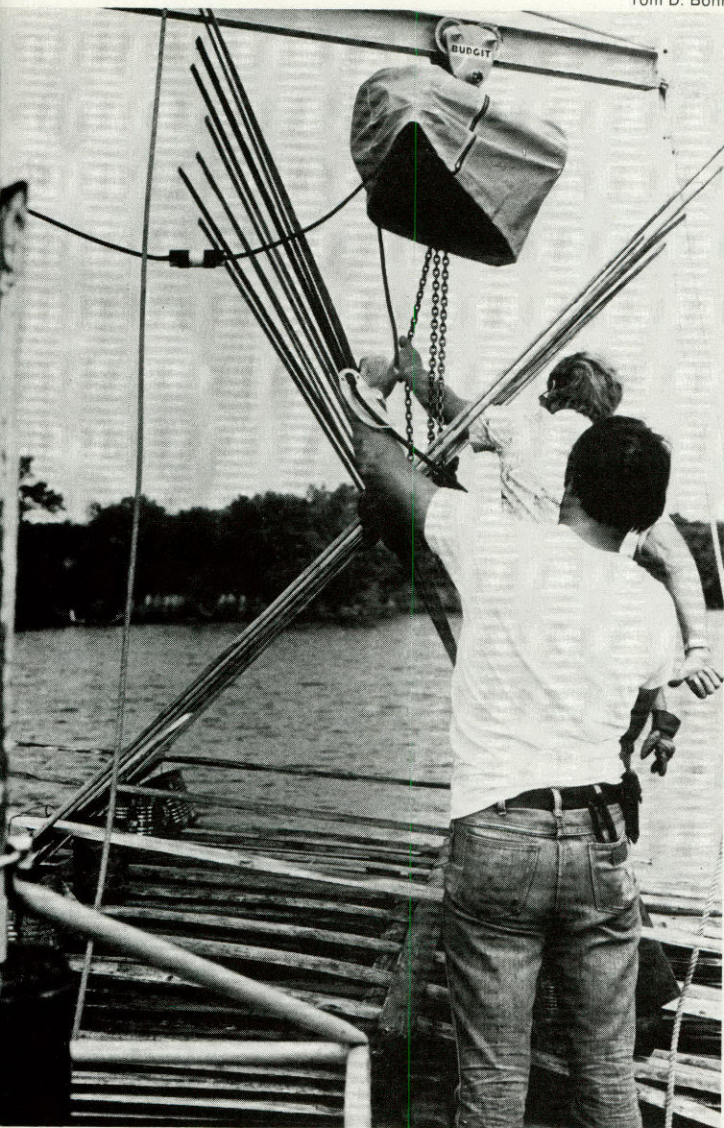
Christmas trees are good for making brush shelters, but deteriorate after three to six years. The trees have few uses after Christmas and may be collected as discards from homes and Christmas tree lots. DO NOT leave aluminum tinsel on the trees or use trees which have been flocked. Tinsel may be eaten by fishes and cause intestinal damage. Flocking may be toxic to fish.

All that is required to build a Christmas tree attractor is wire or ropes of synthetic materials, an anchoring device (concrete construction blocks, bags of sand, large rocks) and, of course, Christmas trees.

Securely fasten enough weight to the base of each tree to anchor it in an upright position. The trees also can be set in



A special barge has been constructed to build and sink fish attractors in Texas lakes. It can handle large numbers of tires, cedar trees, stakes and other reef-building material.



one-gallon cans with cement. Trees should be placed in clusters of five to 10 trees. Each cluster acts as one attractor. Trees should be completely submerged for best results.

I have access to a large number of old automobile tires. How can I use them to build a fish attractor?

Old tires make good fish attractors since they last indefinitely underwater. They must be ventilated by slitting or drilling holes in the sidewalls close to the tread. A 1¼-inch hole-saw is effective. If tire attractors are placed in an area with a current, rocks, concrete blocks or cans filled with cement should be placed between the tire walls to anchor them in position.

Designs for tire structures are endless. Department biologists developed a three-tire, low-profile structure and a seven-tire, medium-profile structure. The use of larger units (seven or more tires) usually requires heavy-duty equipment for handling.

How is scrap lumber used for building fish attractors?

Stake beds can be made with scrap lumber obtained from saw mills. Long, thin pine slats (one-half inch by four inches by 10 feet) have been used by fisheries biologists to construct stake bed fish attractors. Individual frames are built and later assembled at the lake, weighted with concrete anchors and submerged in the reservoir.

Where should attractors be placed in a lake?

To be of greatest value, attractors should be placed on firm bottom, near drop-offs, inundated creek or river channels or in areas devoid of natural cover. A good method to find the best location in your lake is to construct small attractors, place them in the most promising areas and evaluate each one for a period of time. Enlarge the one that provides the best fishing results.

At what depth should shelters be placed?

Shelters placed in shallow water usually attract the largest number of fish, except during winter months. The structures should be placed in 10- to 20-foot water at least five feet below low-water elevation.

How soon will fish become concentrated around the attractor?

In some cases, fish concentration will be noticed almost immediately; however, fishing generally improves after the structure has been in the water two or three months. The time required to notice the concentrating effect will vary in each lake and with type of attractor material.

What sport fishes commonly frequent fish attractors?

Largemouth and spotted bass, bluegill and most other sunfish, crappie and channel catfish are some of the fishes found around fish attractors. Species vary by lake and type of attractor.

I fish in a lake with a large amount of brush and standing timber. Would it be practical to place fish attractors in this lake?

No, placing additional shelter in such lakes would produce little benefits.

If an ideal attractor were to be built, what features would it possess?

The ideal attractor would consist of a variety of materials. Tires and pipes would be used to provide hiding places and spawning sites for large fish. It would contain trees and brush to attract aquatic insects and small fishes, and would extend upward five to 10 feet from the bottom and cover 100 to 200 square feet. In addition, it would be one which is legal, not a hazard to navigation, well-marked and not distracting from the aesthetics of the area.

What is the Texas Parks and Wildlife Department doing to improve fish habitat in our lakes?

The department's fisheries personnel are making statewide efforts to install fish attractor reefs in Texas reservoirs. To accomplish this task a special 25-foot, steel-hull barge was built for large-scale construction of reefs.

The maiden voyage of the barge was made December 1976 at Canyon Lake near New Braunfels. Approximately 30 cedar trees and anchoring material, with a combined weight of as much as 1,000 pounds, were transported to the designated reef site. These trees made excellent fish attractors as they sank rapidly in the upright position allowing for maximum utilization by sport fish.

After the barge was modified for side-loading capability a larger project was undertaken at Lake Lyndon B. Johnson in Llano and Burnet Counties. Four months of hard work at Lake LBJ resulted in four major fish attractor reefs. A total of 1,450 tires, 16 stake beds and more than 125 Christmas trees and 150 cedar trees was installed.

In addition to the efforts accomplished with the special barge, management biologists throughout the state have been placing fish attractors in reservoirs. Any sportsmen's club interested in working with the fish attractor program as a club project should contact the Inland Fisheries, Management Coordinator, 4200 Smith School Road, Austin, Texas 78744 or a local fisheries management biologist. **

Leonard Lee Rue III

Too Many Starlings

by Fred S. Guthery,
Wildlife and Fisheries, Texas A&M University

When the guns fell silent, cartridges littered the ground near Texas A&M's Sterling C. Evans Memorial Library and blood speckled the epoxy-bound pebbles. Occasional distress calls wrenched the stillness. Maintenance crews, manning wheelbarrows and garbage-can liners, arrived with the eight-o'clock chimes the next morning to retrieve the mortally wounded. The score: Aggies 25,000, Blackbirds 0.

Blackbirds, a group including common and great-tailed grackles, brown-headed cowbirds and starlings, had roosted on the campus previously, causing few problems. However, during the 1976 Christmas break, about two million birds moved into the live oak trees in the heart of Aggieland. Walkways an inch deep with excrement greeted the faculty when it returned from the holidays.

Before spring semester classes began, university officials first instituted scare tactics, but finally were forced to direct armed assaults on the huge flock before the birds abandoned the roost. Shovel brigades were established to clear the befouled areas.

This was not the first, nor will it be the last, conflict between blackbirds and man. The depth of the droppings at A&M and the severity of most blackbird problems, would decrease in proportion to the number of starlings had it not been for the immortal pen of William Shakespeare.

In the 87 years since the first starlings were released in New York the European blackbirds have multiplied and spread across the United States. Thousands of birds concentrated in one winter roost such as this pose health problems for man if the site is in an urban area. Control and dispersal techniques attempted range from fireworks to chemical toxicants.

"Nay," wrote Shakespeare in *Henry IV*, "I'll have a starling shall be taught to speak nothing but 'Mortimer.'"

Eugene Scheiffelin, a New York drug manufacturer, was an ardent fan of Shakespeare. He also was a leading force in the American Acclimatization Society, one of many such groups dedicated to establishing Old World birdlife in the New World. Scheiffelin carefully noted all the species in Shakespeare's works and tried to introduce them to America.

In 1890 he liberated 80 starlings in Central Park, followed a year later by 80 more. In 10 years a thriving starling population in the city indicated the bird had passed its naturalization exams. It was now ready to conquer America.

Nonbreeding starlings, usually one to two years old, were the first to explore new territory. Older birds stayed in familiar surroundings.

By 1918 the itinerant youngsters had crossed the Appalachian Mountains and were wintering from Ohio to Alabama. Southeast Texas saw its first starling about 1925. Biologists of the time speculated that the

treeless Great Plains, with its scarcity of nesting sites, might prove a barrier to further westward expansion.

The wave of starlings, however, had enough momentum to carry it across the prairies and over the Rocky Mountains. When the birds reached the Pacific Coast in the 1940s, they spread to the north and south.

In less than 60 years, the starling had colonized over three million square miles, including the lower 48 states. In 1952 it reached Alaska.

This phenomenal success indicates the species was well suited for the American environment, not surprising in light of its original geographic range. The starling is native from Siberia to Norway and south to the Mediterranean. During winter, it migrates into India, Spain and North Africa.

Furthermore, the American colonists and their descendants had been creating ideal starling habitat for more than 200 years before the species arrived. Starlings thrived on the farms that occupied much of this country from the Civil War to the end of World War II.

The bird's fertility allowed the invasion to be rapid. Nesting begins in April or May, and the four to six pale blue eggs hatch after 12 days of incubation. Three weeks later the young are on their own. Since the bird is a cavity nester, brood and nest survival are high. From 30 to 70 percent of the pairs with successful first nests try to raise a second brood. If a male loses its mate, he casts the eggs out of the nest and begins soliciting another mate within 36 hours.

Unrestrained reproduction invariably leads to trouble. Eastern farmers realized this in the early 1900s when starling flocks began raiding cherry and apple orchards. Native cavity nesters, such as bluebirds, failed to reproduce and their populations declined when the aggressive aliens took over their nest sites. Health officials warned that the accumulation of droppings under blackbird roosts provided substrate for the fungus that produces histoplasmosis, a usually mild respiratory ailment. Rice, sorghum and corn growers throughout the United States agonized as immense flocks of blackbirds and starlings devoured their crops. Urbanites cringed when huge roosting flocks showered malodorous greetings on cars, lawn chairs and picnic tables.

Attempted solutions have been as numerous as the problems created by starlings. Farmers of the early 1900s employed "bird minders" to harass and disperse depredating flocks. This work has evolved into pyrotechnic displays that rival productions at a Fourth of July celebration. Spotlights, sparklers, exploding shotgun shells, firecracker ropes, gas exploders, flash bombs, Roman candles and light aircraft equipped with sirens are in the arsenal of modern starling chasers. In essence, if it fizzes, screams, booms, flashes or crashes, it probably has been used to scare starlings.

Pyrotechnics, however, are impractical in urban situations. Thus, technicians have turned to a quieter practice — aquatic warfare. Water laced with detergent (wetting agent) and aqueous ammonia (irritating agent) may be mist-blown over a roost. Spotlights used simultaneously increase the effectiveness of this

treatment. After three or four soggy, sleepless nights, the birds that haven't died from exposure usually abandon the area.

Residents of East 16th Avenue in Denver solved their starling problem electronically. Federal biologists supplied recordings of starling distress calls, which were played through open windows on neighborhood phonographs when the evening flocks returned to this urban roost. After four nights of listening to the sounds of anguished brethren, the birds thought better of returning to East 16th Avenue.

Such tactics, unfortunately, just shift rather than solve the particular problem. As a result, lethal methods of starling control sometimes are indicated.

The U. S. Fish and Wildlife Service screened over 400 chemicals in a search for an effective, selective, inexpensive starling toxicant. They found a compound, code-named DRC-1339, that meets these requirements. Using DRC-1339, control agents have reduced depredations in western feedlots, where 1,000 starlings can consume over \$80 worth of cattle feed annually, a considerable amount when multiplied by the number of birds in these huge flocks.

In Arkansas, where blackbirds and starlings attack maturing rice, technicians tried a lethal technique that had been used to reduce crow concentrations in Oklahoma. They set out shrapnel-loaded bombs in a red haw-persimmon roost. Ten bombs, detonated in sequence, destroyed over 23,000 blackbirds. Although the kill was spectacular, it was of no consequence to the large population, and the economics of the procedure were questionable.

"Roost bombing," wrote one technician in classic understatement, "is considered hazardous and is not a safe operation for an amateur."

A novel lethal control method was suggested just after the turn of the century. Why not eat starlings?

"There is some merit to this suggestion," said E. R. Kalmbach in 1928, "although the rather strong, gamy flavor of the starling's flesh will probably limit its popularity from a culinary standpoint.

"When the breasts of these birds have been soaked in a soda-salt solution for 12 hours and then parboiled in water, which is afterwards discarded," Kalmbach said, "they may be used in a meat pie that compares fairly well with one made of blackbirds. . . ."

Though it may be some time before Americans are ready to accept starling pie, this solution is no less reasonable than many already tried. Future starling chasing, excluding development of a "bionic scarecrow," probably will be conducted along the lines of past and present efforts.

In fairness to the bird, we should recognize that its vast continental population consumes tons of insects, including many harmful species, during the summer. And, like any scapegrace, the starling often is wrongly accused of misdemeanors. But few deny that the bird is an unwelcome member of our fauna. The starling's story is an object lesson in the perils and pitfalls of introducing foreign animals without extensive biological research.

**

Whizzing along under reduced throttle at about 45 m.p.h., the game warden guided his airboat easily through the scattered grass in the six-inch-deep water. His undivided attention focused on the route he was traveling because, although the boat was designed for the shallowest of shallow water, an emergent oyster shell reef could be a disaster. The other two wardens on board scanned the waters around the moving airboat for illegal nets.

Just a couple of months earlier they had spent many hours in the shallow grassy flats checking duck hunters. The blinds of the hunters had been, almost without exception, built in water that could be reached only by poling conventional boats or by wading and dragging the boats behind. Airboats, however, skimmed over the shallow water with the greatest of ease and allowed the wardens to check most of the duck hunters in Aransas, Corpus Christi, Copano and Port Bays on any given day. Using conventional boats they could have accomplished only a fraction of the job.

Veteran game wardens say that the use of airboats by fishermen and duck hunters in the Rockport-Port Aransas area has increased by 3,000 percent in the last few years, giving these people access to waters that wardens cannot work in conventional boats. Law enforcement officials quickly realized that wardens too, would have to switch to airboats if they were to be able to enforce the law and apprehend illegal hunters and fishermen.

After much testing, a boat built in Florida was purchased. The 15-foot boat, which will carry a crew of up to three wardens, is made of aluminum alloy and powered by a 260 h.p. Lycoming aircraft engine. It is capable of speeds in excess of 60 m.p.h. but rarely, if ever, is it necessary to utilize this speed. The important characteristic of the boat is its ability to travel in almost no water.

This one boat stationed in Aransas Pass has made a world of difference in the effectiveness of law enforcement efforts. From September 1976 through March 1977, wardens have been able to locate and remove from the water about 25,900 feet of

illegal nets. Most of these nets were set in water that would have been difficult or impossible to reach in conventional boats.

Much of the locating of these illegal nets has been done in conjunction with the department airplane stationed at Rockport. The airboat and airplane make a fine team. An observer in the plane spots the nets and radios their locations to the airboat crew which goes in after them.

Uses being found for the airboat continue to multiply. In addition to law enforcement needs, the boat also has a potential for emergency rescue work. One veteran law enforcement supervisor says that the only thing he finds disappointing about the airboat is the fact that there is only one in the area. **

Airboats give department game wardens mobility they have never before enjoyed. Skimming over shallow marshes they can check duck hunters and fishermen in spots inaccessible to conventional boats and in much less time. Sportsmen along the coast are using airboats more and wardens also have made the switch to keep pace with Texas hunters and fishermen.

Airboats Take Them Where They Need To Go

by L. D. Nuckles, Information Officer, Rockport



Buddy Gough

Sandhill Challenge

by J. D. Peer, Information Officer, Lubbock

The fall day is clear with a few high cirrus clouds. Hints of winter can be seen as flocks of crows, blackbirds and smaller ducks fly over the West Texas Plains.

A high-pitched, trumpeting cry comes with the north wind. Within minutes a large flock of high-flying, circling birds is spotted drifting slowly south. It can only be a flight of sandhill cranes.

This morning, the shallow playa lakes of the Texas Plains held a few shore birds and a duck or two. But by evening, a hundred, and by next week, a thousand sandhill or little brown cranes will bring the prairie alive.

The trip south from the summer nesting grounds in Alaska, Canada and the Arctic may have been traversed in one or two flights as the air currents lifted the graceful birds up to extreme heights.

With necks and legs fully extended in flight, sandhill cranes are readily distinguishable from egrets or herons whose necks curve back against their bodies.

As the cranes drop from the sky, their large size is readily noted — height 3½ feet, wingspan up to six feet and weight from five to eight pounds. The plumage varies from a brownish color in younger birds to gray in adults. The crane has a reddish forehead with a white or grayish patch running under the eye from the thin beak to the back of the head. Long, black legs reach for the ground as the cranes land in a nearby wheat field. The birds' keen eyesight makes it difficult for humans and other predators to surprise them. Within minutes, the tall graceful cranes are foraging for plant and animal food.

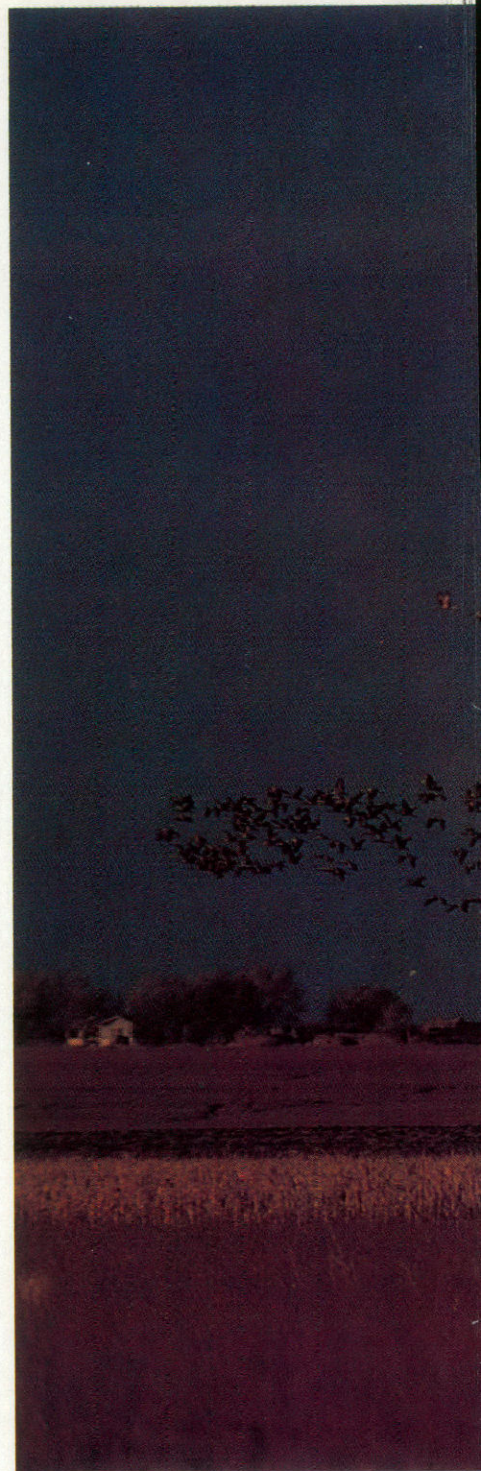
At home on land or shallow water, the sandhill will head for playa lakes as the sun drops on the distant horizon. Only inches deep, these open, shallow expanses afford protection to the wintering birds.

Including the nonmigratory Cuban, Florida and Mississippi and the migratory Canadian, greater and lesser sandhill cranes, six subspecies are found in North America. Both the Cuban and Mississippi subspecies are on the endangered list. The other four subspecies are neither endangered nor threatened.

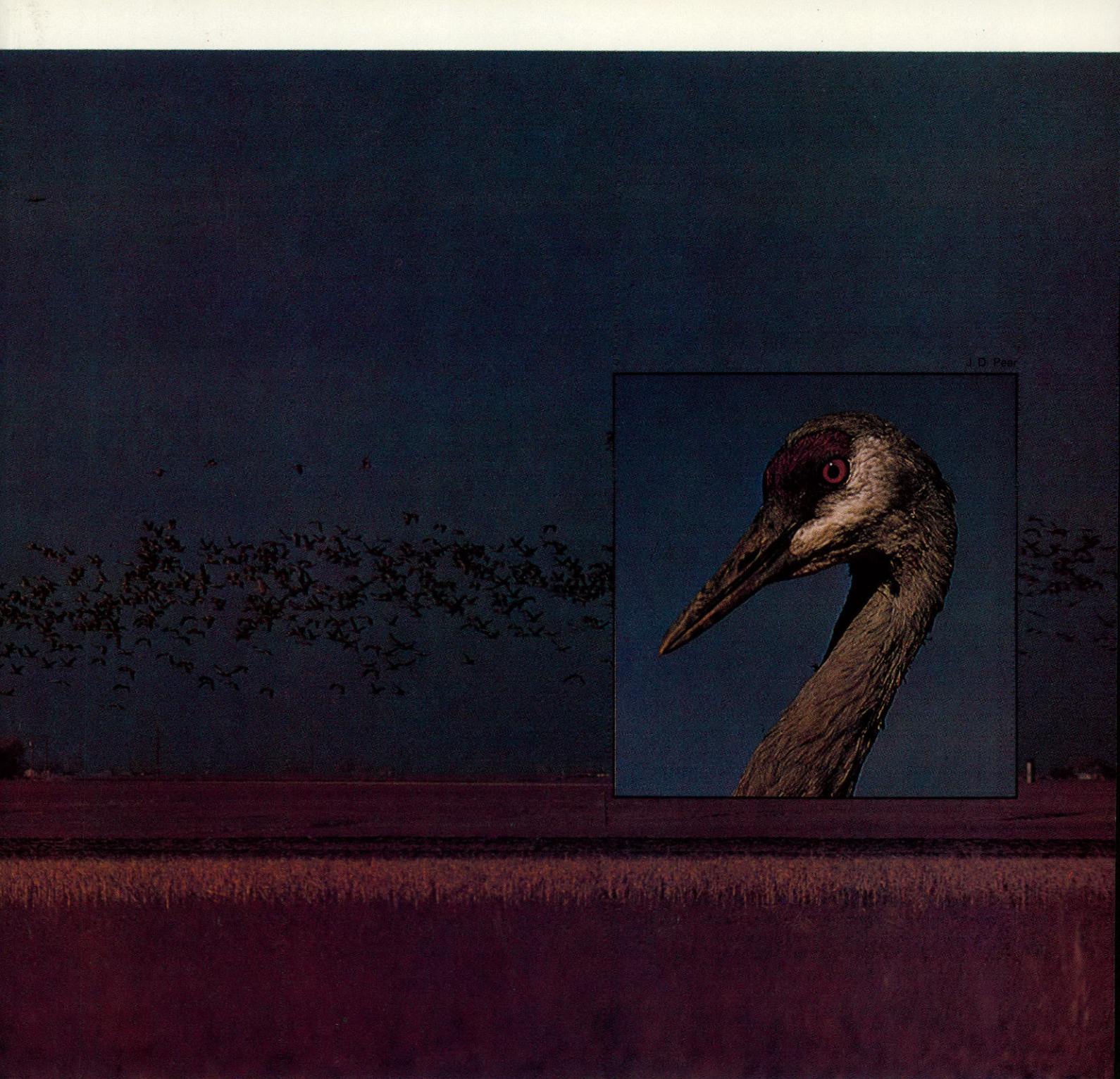
The lesser sandhill crane accounts for the majority of the entire crane population and numbers from 220,000 to 290,000 birds in the wintering areas of Texas, Oklahoma and New Mexico.

An abundance of grain on the Texas Plains furnishes the birds with ample food. Normally, sandhill cranes prefer cut grain fields but, if none are available, damage to uncut grain can be serious. Reports are continually being received from irate farmers as the birds land and eat grain by the bushels. During the crane's feeding periods in early morning and late evening, thousands of birds can be seen flying from the playa lakes to the grain fields. If they are not disturbed during the day, many flocks will remain in the grain or cotton fields until evening and then return to the playa lakes. Cranes will return to the same fields if undisturbed, causing additional damage to already picked-over crops.

Unlike the endangered whooping cranes which have been protected since 1916, sandhill cranes are hunted in Texas and several other states.



Jim Whitcomb



J. D. Peer

More than a quarter million sandhill cranes winter in Texas, New Mexico and Oklahoma. Grain fields in the Texas Plains attract and hold thousands of the large birds each year. The birds stand 3½ feet tall with a wingspan of six feet. The red forehead of the adult sandhill, inset, distinguishes it from the immature bird which has a brownish head.

The first hunting season for the sandhill crane since 1915 began in Alaska and portions of New Mexico and Texas in 1961. In the years following, more Central Flyway states, such as Colorado, Montana, North Dakota, South Dakota, Oklahoma and Wyoming, were allowed to hunt cranes.

Seasons vary from 30 days in the Dakotas to 93 days in areas of Texas and New Mexico. The 1977-78 sandhill crane season has been set for November 1, 1977, to January 31, 1978, in Zone A and December 5, 1977, to January 31, 1978, in Zone B (see map). The daily bag limit is three birds, with a possession limit of six.

To better monitor the crane season, a federal sandhill crane permit was required for the 1975-76 and 1976-77 seasons. A survey was made in the spring of all permit holders after the close of the season. The questionnaire asked for the number of days hunted, number of cranes harvested, number of crippled birds and counties hunted.

Texas hunters made up approximately 49 percent of the active

permit holders and accounted for 83 percent of the sandhill crane harvest in the United States in 1976-77. Lynn County in the South Plains of Texas had the largest number of cranes harvested with 304 hunters bagging 1,235 birds. A total of 6,122 birds was harvested across Texas during that season.

A free federal sandhill crane permit again will be required for the 1977-78 crane season and is available through the Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744.

Aerial and ground counts by department personnel help monitor the crane populations in Texas each winter. These figures are compared with past surveys and fluctuations of crane populations are noted.

The sandhill crane hunting area in Texas is divided into two zones to provide additional protection for whooping cranes migrating to their coastal wintering grounds early each fall. The season opening in Zone B is delayed until late November or early December to ensure safe passage of all whoopers.

Successful Texas hunters use

several methods to outwit the wily crane; the most popular and productive technique is the use of rag decoys.

Crane hunters arrive well before daylight at a harvested grain field frequented by cranes. Rag decoys about 30 inches square are draped over the cut grain stalks with some hunters using as many as 300 decoys in one spread. Hunters conceal themselves from the sharp eyes of the cranes by hiding under burlap bags or camouflage material.

As the eastern sky lightens, an increasing roar can be heard on the playa lakes as the cranes prepare to leave for the grain fields. Flight after flight of sandhills are soon climbing skyward toward the fields and, hopefully, the rag decoys. Some hunters have perfected a crane call and use it with success.

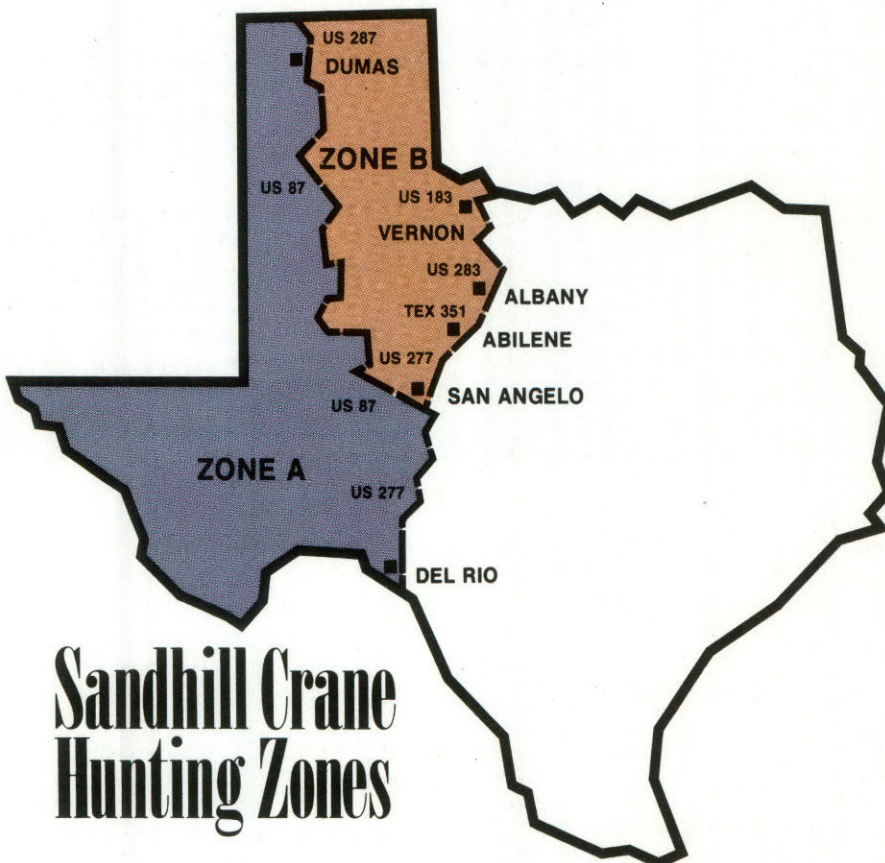
The large size of the crane has fooled many experienced waterfowl hunters into thinking the birds are within shotgun range. Most successful hunters allow the birds to set their wings over the decoys before picking their targets.

The cranes are easy to hit at close range, but hard to bring down. Large shot — BB to Number Four — seem most popular among crane hunters. Both dead and wounded birds should be retrieved immediately, as hunters have lost wounded birds when they hide or run through the grain. Only an experienced retriever should be sent after a wounded crane. With his long, sharp beak, a crane can do considerable damage to a dog's eyes or even a hunter's hand.

Many a sandhill crane hunter has gone afield with expectations of a full game bag only to come home empty-handed after watching the birds stay out of gun range all day.

Since sandhill cranes are migratory birds, all shotguns must be plugged to hold no more than three shells in the chamber and magazine combined. A federal migratory waterfowl stamp is not required to hunt cranes but one is necessary if the hunter finds ducks and geese in the same area.

As winter progresses and grain fields are stripped of all grain or plowed by the landowner, the



Sandhill Crane Hunting Zones

cranes must fly farther and farther to feed each day. Although most South Plains lakes hold sandhill cranes during the winter, the availability of food is the determining factor during daylight flights.

As February ends, many lakes and areas not normally associated with cranes will be utilized as the birds increase their feeding range. Flights of 40 to 60 miles each day for food are common in late winter.

As spring approaches, brief early mating dances can be observed among the crane flocks as the birds hop up and down on the ground. Soon, flocks of cranes are seen circling north toward the staging grounds along the Platte River in Nebraska, and by April, the playa lakes and grain fields of the South Plains are once again silent except for the ever-present shore birds and crows.

Jim Whitcomb



Hunter success means a treat for the dinner table as the breast meat of the crane is sliced, floured and fried. The meat is dark like duck, but with its own distinct flavor. The entire picked and cleaned bird can be baked, but very little meat will be found on the legs and wings of the tall, thin crane.

Even though hunting pressure has increased in all states which allow fall and winter hunts, population counts in the spring give no indication of a decreasing population.

Federal refuges such as the Muleshoe Refuge in West Texas on the New Mexico border normally holds thousands of cranes if there is available water. Hunters not familiar with crane hunting areas can contact local hunters or the chamber of commerce office in any South Plains county to receive information on local conditions. Department personnel stationed across the South Plains of Texas also furnish information on concentrations of cranes.

Landowners usually welcome crane hunters, hoping the sportsmen will drive the sandhills from the grain fields.

More hunters are turning to crane hunting and some dyed-in-the-wool waterfowl hunters have found the crane smarter and more challenging to hunt than the Canada goose.

The management and hunting of the sandhill crane will continue to be closely monitored by both federal and state agencies to ensure the sandhill crane will continue to frequent the flat playas of the Texas Plains every winter. **

Many successful sandhill crane hunters use gray-colored rag decoys draped over grain stalks to draw the wary birds within shotgun range. Burlap bags are used for cover to remain concealed from the sharp eyes of the cranes until they have set their wings and come into the decoy spread. At close range sandhills are easy to hit but hard to bring down. BB to Number Four shot should be used.

around the state...

News of the Texas outdoors from the Parks & Wildlife Department's news service.

SEVENTY MILES OF ILLEGAL NET AND TROTLINES REMOVED FROM BAYS

AUSTIN—More than 28 miles of illegal trotlines and 42 miles of illegal nets were removed from bays between Rockport and Port Isabel during the Sept. 1976—Aug. 1977 fiscal year by Texas Parks and Wildlife Department game wardens, according to a report

compiled by Captain Frank Dickerson, who supervises that area.

Removed with the illegal gear were 2,800 pounds of redfish; 1,500 pounds of trout; 200 pounds of flounder and 10,000 pounds of other fish. These fish were sold to the highest bidder and the

revenue was transferred to state funds.

According to Dickerson, these totals do not include fish which were in good condition and were released back into the bay.

The nets took a high percentage of the trout and the trotlines were more effective in taking redfish, said Dickerson.

TEXAS JOINS IN BANDING OF SNOW GESE IN ARCTIC

AUSTIN—An international team this year spent a cool and rewarding summer in pursuit of Arctic snow geese, as part of a cooperative banding program.

Although these are the world's most numerous geese and the most abundant for Texas hunters, who bag an average 100,000 annually, little has been known about them. Aim of the proposed 10-year program, which began this year, is to find out about the birds' migrations, to pinpoint where and to what extent they are harvested from each of their colonies.

The project involves the U.S. and Canadian Fish and Wildlife Services, the Texas Parks and Wildlife Department and other state game departments in the Central and Mississippi Flyways. This year's banding team included four Americans, representing Texas, Louisiana, Oklahoma and Nebraska; eight members of the Canadian Wildlife Service, and eight of the local Eskimos. The Texan was P&WD biologist Larry Weishuhn.

Banding location was the west shore of Hudson Bay, between the McConnell and Tha-anne river deltas, one of the geese's major breeding areas. Through July and early August, more than 10,000 nonbreeding, sub-adult snow and blue geese and approximately 16,000 breeding adults and young goslings were banded.

There had been reports this Hudson Bay colony was growing so rapidly the

geese were overgrazing the tundra vegetation and insects. Larry Weishuhn said he did observe areas where everything had been eaten and the habitat was threatened. "This is a well-designed study," he said, "and we need to continue to completion, if at all possible. It will be really important in the future. Inadequate available food may lead to a decrease in birds."

It may be necessary to increase the harvest of geese from that colony, to keep it in balance and so less productive colonies are not over-harvested, but first it must be determined where a particular flock winters. That is one of the reasons for the banding.

Next year, banding will continue in the same area, but in 1979 plans call for increased operations to include goose colonies in the huge Southampton Island and Baffin Island, north of the Hudson Bay area. To gain an adequate picture of

the status of the geese and where they are hunted, wide-scale banding will need to be continued for several years.

It was a hard but worthwhile summer's work, with a bonus for Weishuhn of an average 50-degree temperature, as compared to 100-plus at his Abilene home. Weather mostly was beautiful up in the Arctic, he said. Only about a week was lost due to adverse conditions, with high winds, rain and sleet.

Work had to be postponed for another three-day period because of caribou. Their migration route was within a mile of the banders' camp and local Eskimos did not want work done while the caribou were moving. Some 40,000 of the animals filled the tundra, as far as the eye could see, said Weishuhn. The biologists observed and photographed them from a helicopter during the necessary lull in banding.



More than 26,000 snow geese were banded in Canada this summer as part of a program to learn more about the popular game bird.

NEW KEITH LAKE CHANNEL WILL HELP SEA RIM SHRIMP

SABINE PASS—An important breakthrough was made in early fall completing a water exchange pass from Keith Lake to the Port Arthur Ship Channel in Jefferson County. It was the culmination of years of effort and study and is expected to be of significant benefit to the environment.

Biologists believe the marshlands and lake at Sea Rim State Park will be greatly enhanced by this water exchange pass. A valuable result should be a major increase in shrimp production.

The project was a joint venture of the Texas Parks and Wildlife Department

and the U.S. Department of Agriculture's Soil Conservation Service. A large part of the credit goes to the Southeast Texas Resource, Conservation and Development Project, a group of citizens who work closely with the SCS to obtain federal cost sharing for needed conservation programs such as this one.

The 3,100-foot-long by 150-foot-wide channel runs from Keith Lake to the State Highway 87 bridge basin, five miles north of Sabine Pass. It connects Sea Rim State Park and adjacent marshlands to the Port Arthur Ship Channel and the Gulf of Mexico. This means 54,000 acres of vital breeding estuaries for shrimp, fish and crab are brought closer to Gulf waters.

WATER SAFETY RULE BOOK AVAILABLE

AUSTIN—Texas boaters receiving their new Certificates of Number from the Parks and Wildlife Department also will receive a new "Digest of the Texas Water Safety Act."

The new "Digest" explains the Texas Water Safety Act in language understandable to the boating public and lists equipment required on Texas boats.

To help the boater who wants more information, the P&WD has printed three new leaflets; "Texas Certificate of Number and Title," "Equipment Regulations for Motorboats in Texas" and "It's the Law."

These new leaflets and other water safety material may be obtained from P&WD district offices or by writing the Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744.



Some 16¼ million persons visited Texas state parks this last year, an 11-percent increase from the past year. Most of the visitors — more than 14 million — stayed only for the day. Another 2½ million spent the night.

STATE PARK VISITATION SHOWS CONTINUED INCREASE

AUSTIN—More people than ever are flocking to state parks. Visitation totals compiled by the Texas Parks and Wildlife Department for the period Sept. 1, 1976, through Aug. 31, 1977, show an approximate 11 percent increase over those of the previous year.

State parks are located throughout Texas in each geographical region and comprise a wide variety of scenic, recreational and historical features. There are 101 in all, among them a few new ones not yet open to the public.

Overall, the parks drew

approximately 16,780,000 during the 1976-77 fiscal year, an increase of over 1,670,000. Overnight facilities were used by more than 2½ million visitors and day-use totals exceeded 14 million.

Topping the list, as usual, for total visitation was San Jacinto Battleground State Historical Park in Harris County. This consistently popular park drew 1,437,695. Second place for total visitation was a newcomer, Galveston Island State Park in Galveston County. This park, which was open only about seven months last year and where the historic drama "The Lone Star" began its first season, attracted 1,300,139 total visitors.

EXTRA TURKEY TAG FOR FRIO COUNTY

AUSTIN—Turkey hunters in Frio County can harvest three turkey gobblers this fall.

During the last session of the Texas Legislature, a bill was passed which established a two turkey gobbler bag limit for the fall season in all general law counties. The Texas Parks and Wildlife Commission at its April meeting approved such a limit for the fall season in those counties under its regulatory authority. However, Frio County is one of the 27 counties where the County Commissioners Courts have final authority over the action of the Parks and Wildlife Commission. The Frio County Commissioners Court voted to retain the three gobbler bag limit for their fall season.

An additional turkey gobbler tag, valid only in Frio County, has been printed and is available free upon request. It may be obtained from P&WD personnel in Frio County, from the County Clerk, or by writing the Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, TX 78744 and requesting an application blank.

To be valid, the third tag must be attached to a current hunting license.

A Gift Of Land

Park Donations Benefit All Texans

by Mike Herring, Special Studies & System Planning Branch



Leroy Williamson



Bill Reaves

The present Texas State Park System owes much to the generosity of private individuals and the commercial interests of Texas. In fact, the early growth of the system was entirely dependent on gifts. At the time of its creation in 1923, the Texas State Park Board was authorized only to accept donations of land, but even with this limited authority, the young state park system grew. By 1926 some 50 park sites had been donated.

Unlikely as it may seem, the depression of the 1930s brought Texas its greatest number of park donations. During this period of national financial crisis, the Federal Government provided assistance for state park development as part of its economic recovery program, and park construction was most often performed by the Civilian Conservation Corps, the National Youth Administration or the Works Progress Administration. Since this meant new jobs for local residents, many rural communities were eager to participate in the program and park donations by individuals, cities and counties were numerous at that time.

Many of these early donations later reverted to their original owners due to the lack of state development funds, or were transferred to cities or counties, but the remaining gifts formed the backbone of the present Texas State Park System.

By 1968 almost 18,000 acres had been acquired through approximately 145 gifts from individuals. Examples of the generosity of these early donations abound in the system today and include such parks as Bentsen-Rio Grande Valley State Park, donated by Lloyd M. and Edna Ruth Bentsen in 1944; Varner-Hogg Plantation State Historical Park, donated by Miss Ima Hogg in 1956 and 1967; and Buescher State Park donated by Mrs. Elizabeth Buescher in 1933.

Prior to 1968, only two parks, Palo Duro Canyon and Longhorn Caverns, had been acquired by purchase, but several parks had been leased from federal agencies on a long-term basis without cost. Such acquisitions were vital to the growth of the system; however, without adequate financing new park acquisition was falling behind recreational demand.

In 1967, the department received voter approval of a State Park Acquisition and Development Bond Program, which made available \$15.75 million and provided the first significant funding for new park acquisition. Although the department now had the financial means to begin an active park acquisition and development program, it was unable to make up the existing park deficit and keep pace with future needs. Consequently, the department continued its efforts to cooperate with other governmental agencies in obtaining no-cost, long-term leases for park purposes, as well

Some of Texas' most beautiful state parks have been gifts to the public from private citizens. McKinney Falls, far left, south of Austin, has become one of the most popular parks in Central Texas since it opened in 1976. The almost two miles of beach at Galveston Island, left, attract visitors from all over the state.

as seeking out and accepting gifts and no-cost leases from individuals or private industry.

In the past 10 years the department has received 18 gifts or no-cost leases of outstanding recreational areas and significant historical sites from individuals, organizations and private industry, adding 9,001 acres to the state park system. A list of these recent acquisitions is presented in the accompanying chart.

Gifts or donations of land to the state park system can take many forms. The simplest and most direct, of course, is an outright gift of land or a "fee simple" donation. Fee simple donations are the most desirable type, since there are no strings attached and all surface and often most mineral interests are included. McKinney Falls State Park, near Austin, is a good example of this type donation.

Sometimes an individual may wish to donate a tract of land, yet retain some use of the property. Such an arrangement is referred to as a "reserved life estate." Under this method the donor insures preservation of his land while he lives on and uses the land or a portion of it for the remainder of his life or, if he chooses, the lifetimes of the members of his immediate family. A reserved life estate often precludes use of the property by the public or the department for an unknown length of time. Examples of reserved life estates on all or a portion of park properties include Landmark Inn, the Starr Mansion in Marshall and a recently donated ranch on the South Llano River.

When, for one reason or another, a landowner is not in a position to make a full property donation, the alternative of purchasing the land at less than its fair market value is available. A sale at less than fair market value, or a "bargain sale," allows the state to realize a savings on the acquisition while providing the owner with some immediate return for his property. A portion of the Lake Livingston State Recreation Area acquisition was originally offered as a bargain sale, but was eventually completed as a combination donation and sale in order to take advantage of federal matching funds available at the time.

Another type of no-cost acquisition that has been extensively used by the department is the "long-term lease." A long-term lease is a contract for exclusive possession and use of lands for an extended period of time, usually 50 years or more. Fees can be charged for leases, but in working with other governmental agencies and private enterprise, these are normally at no cost to the department. Most park leases are with governmental agencies; however, two excellent examples of cooperation with private industries are evident at Fairfield Lake and Lake Colorado City State Recreation Areas.

In addition to the obvious benefits to the state, one might wonder what benefits a landowner could derive from donating land to the state park system. Many Texas landowners have a deep appreciation and love for their land and feel strongly about preserving it for future generations to enjoy; however, in the face of mounting taxes and attractive opportunities for sale,



Landmark Inn in Castroville, above, has offered shelter to travelers for more than a 100 years and was a stopping place for wagons and stagecoaches during the 19th century. Lake Colorado City, right, is a popular fishing and boating spot in Northwest Texas. The lake is a consistent producer of bass and catfish.

they are finding it increasingly difficult to retain real property. Faced with the alternative of selling portions of their land and watching its beauty destroyed, more and more people are choosing to donate land to nonprofit organizations or governmental agencies for preservation and for various forms of outdoor recreation.

Land donated to the Parks and Wildlife Department as a part of the state park system not only is insured of future preservation, but also is made available for public use and enjoyment. The extent of utilization of such land is primarily dependent on the designated park classification for the property. Varying degrees of development and public use are allowed on different types of parks; however, protection of the natural resources while promoting public use is the major goal for all park classifications.

Today it is easier for a landowner to give land or a partial interest in land than it has ever been before. Federal law encourages gifts of real property by providing substantial income tax advantages, capital gains savings and estate tax benefits to the donors.

Unfortunately, the department cannot accept all land donations offered to it. The high costs of operation, maintenance and development of park lands make it financially infeasible to accept gifts that do not meet certain minimum department standards. The

suitability and quality of the resource, the size, the location in relation to the public need and other factors, are all considered before a land donation is accepted. There are no specific size guidelines for historical and natural areas but certain resource criteria are used in evaluating these sites. The minimum size for new state recreation areas is 500 acres and the minimum size for new state parks is 1,000 acres.

Individuals interested in donating land to the state park system should contact the Land Acquisition Branch, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, telephone number AC 512/475-4995.

Today, approximately 20 percent of the state park system acreage has been acquired at no cost to the department, through the generosity of private individuals and industry and additional acreage has been acquired at no cost through long-term leases. These gifts have resulted not only in the preservation of many acres of valuable land, but they also will provide untold hours of recreational enjoyment for millions of state park visitors for generations to come. For this reason, we are taking this opportunity to recognize and say "thank you" to those individuals and organizations whose unselfish gifts have helped create a recreational legacy in the Texas State Park System.

In light of escalating land values and increasing demands placed upon the Parks and Wildlife Department's funding sources, low-cost land acquisition and donations are as important today as they have ever been. The generosity and sensitivity of today's Texas landowners can play a significant part in providing for the future recreational needs of the state's citizens.

**



Bill Reaves

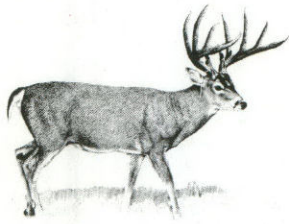
**STATE PARK SYSTEM LAND DONATIONS
1968 — PRESENT**

PARK NAME	COUNTY	ACREAGE	TYPE OF TRANSACTION	DONOR(S)
Bar-O Ranch Site	Bandera/ Medina	1,358	2/7 Undivided Interest	Louise L. Merrick
Fairfield Lake State Recreation Area	Freestone	1,460	25-Year Lease	Industrial Generatng Co.
Fort Lancaster State Historic Site	Crockett	39	Gift	Claude W. Meadows, Jr. and Henry Meadows
Ft. Lancaster S.H.S.	Crockett	42.5	Gift	Clara Lee Benckenstein, et al
Ft. Leaton S.H.S.	Presidio	.6	Gift	Charles C. Stringfellow, Jr.
Ft. McKavett S.H.S.	Menard	9.1	Gift	Camilla Ball Edwards
Galveston Island State Park	Galveston	1,921.8	Bequest w/reserved life estate	Maco Stewart, Sr.
Lake Colorado City State Recreation Area	Mitchell	500	50-Year Lease	Texas Electric Service Co.
Lake Livingston State Recreation Area	Polk	163.2	Gift	Southland Paper Mills, Inc.
Landmark Inn S.H.S.	Medina	1.9	Gift w/reserved life estate on residence	Ruth Lawler
Martin Creek Lake Site	Rusk	216	Gift	Dallas Power and Light Co., Texas Power and Light Co. & Texas Electric Service Co.
McKinney Falls State Park	Travis	632.2	Gift	J. E. Smith, Bertha Smith and Annie M. Smith
Navarro House S.H.S.	Bexar	.3	Gift	San Antonio Conservation Foundation
South Llano River Site	Kimble	2,630	Gift w/reserved life estate on residence	Walter Buck
Starr Mansion S.H.S.	Lamar	1.5	Gift w/reserved life estate	Clara Pope Willoughby and Ray Willoughby
State Railroad S.H.P.	Anderson/ Cherokee	.9 23.9	Gift Gift	Lee Lasiter Temple-Eastex, Inc.
Washington-on-the Brazos S.H.P.	Washington	.3	Gift	George A. Butler
TOTAL		9,001.2		

New Limited Edition Prints by Charles Beckendorf

These highest quality 11 x 14 inch prints are limited to only 750 impressions of each subject and no more will ever be printed. Each print is given a number and signed by me.

I personally hand watercolor the first 100 prints and 650 are left in black and white.



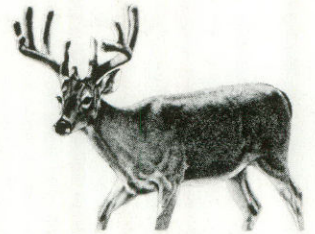
1 WHITETAIL BUCK



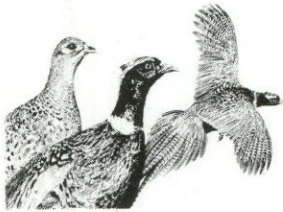
2 WHITETAILS



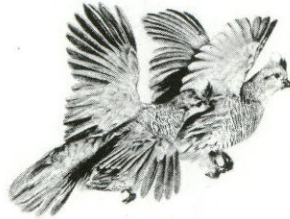
3 WHITETAIL FAWN



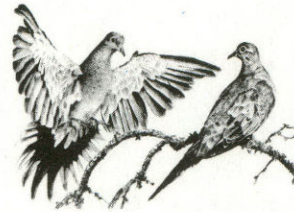
4 WHITETAIL IN VELVET



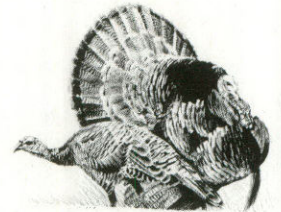
5 PHEASANTS



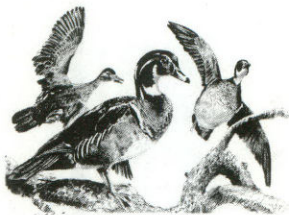
6 BLUE QUAIL



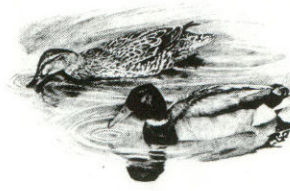
7 MOURNING DOVES



8 RIO GRANDE TURKEYS



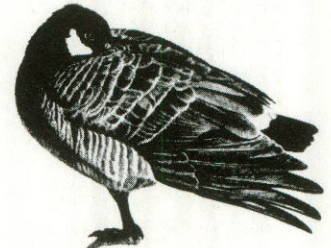
9 WOOD DUCKS



10 MALLARDS



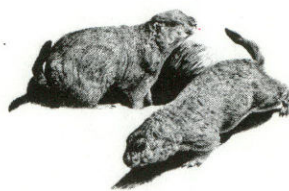
11 BLUE GEESE



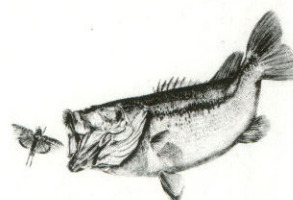
12 CANADA GOOSE



13 ROAD RUNNER



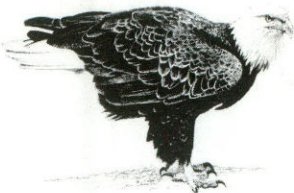
14 PRAIRIE DOGS



15 BASS



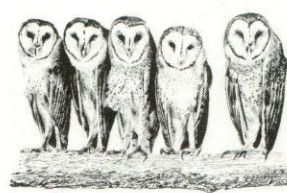
16 BOB WHITE QUAIL



17 BALD EAGLE



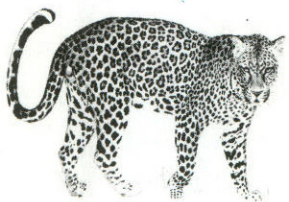
18 GREAT HORNED OWL



19 BARN OWLS



20 SCREECH OWLS



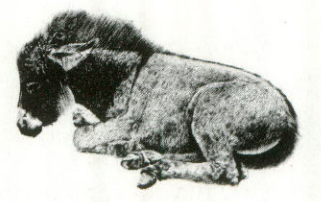
21 AFRICAN LEOPARD



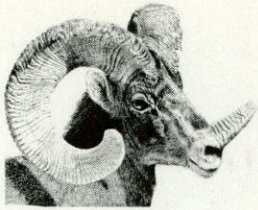
22 YOUNG ZEBRAS



23 TIGER CUBS



24 YOUNG BURRO



25 DESERT BIGHORN



26 DALL SHEEP



27 STONE SHEEP



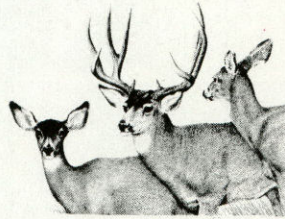
28 ROCKY MOUNTAIN BIGHORN



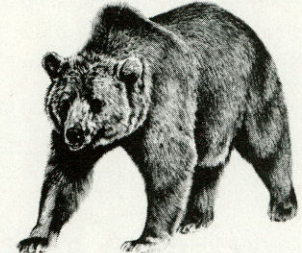
29 PRONGHORNS



30 AMERICAN ELK



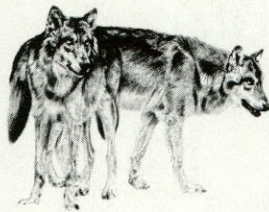
31 MULE DEER



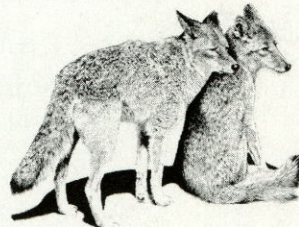
32 BROWN BEAR



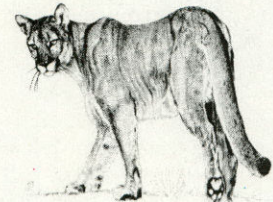
33 BISON



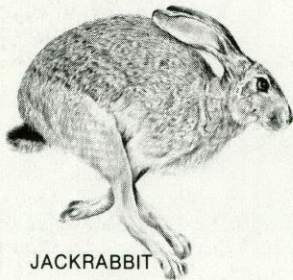
34 WOLVES



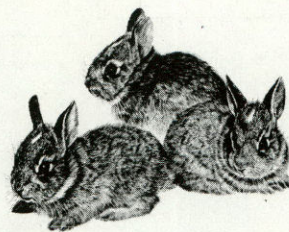
35 COYOTES



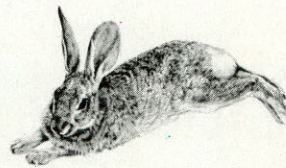
36 COUGAR



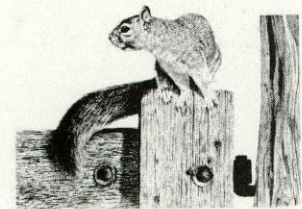
37 JACKRABBIT



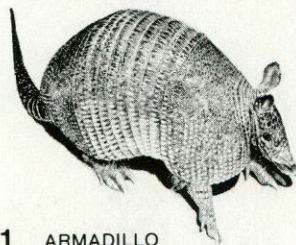
38 BABY COTTONTAILS



39 DESERT COTTONTAIL



40 SQUIRREL



41 ARMADILLO



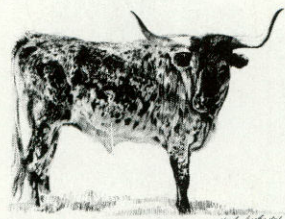
42 RINGTAIL



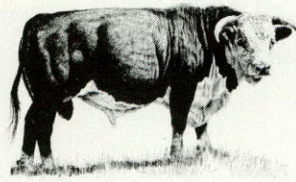
43 OPOSSUM



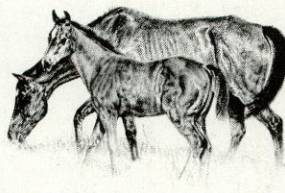
44 STRIPED SKUNKS



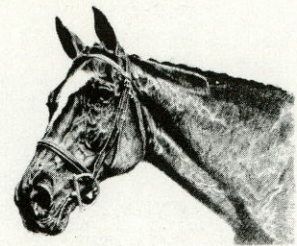
45 LONGHORN STEER



46 HEREFORD BULL



47 QUARTER HORSES



48 JUMPER

The black and white prints are \$7.50 each, and the hand watercolors are \$30.00 each. Texans please add 5% sales tax. Satisfaction and condition of package is fully guaranteed. Simply list your selection by number, enclose check with your complete return address and mail to:

Charles Beckendorf

P.O. Box 728

Fredericksburg, Texas 78624

**STATEMENT OF OWNERSHIP
Management and Circulation**

TEXAS PARKS AND WILDLIFE is published monthly by the Texas Parks and Wildlife Department at the Texas Parks and Wildlife Office Building, 4200 Smith School Road, Austin, Travis County, Texas 78744, David Baxter, Editor. During the past 12 months, the average net press run has been 124,625, paid circulation 116,412, free distribution 3,139, and 5,074 for files, spoilage, etc. September issue ran 123,000 press run, 114,694 paid circulation, 3,265 free distribution and 5,041 for files, spoilage, etc.

**KEEP NOISE
TO A MINIMUM.**

**Respect the rights
of fellow campers
to enjoy the sounds
of nature.**



BUSHWHACKER

COMPARE!

- professionally designed
- simplified assembly
- sturdy and quiet

SAVE MONEY!

ground blind \$126.00
with 10' tower \$205.00

+5% sales tax/f.o.b. Houston
P.O. Box 42233, Hou., Tex.
713/783-0133



Wheel Winch
Been Stuck Lately?
Long walk? Ruined trip? Be out with ease in seconds! Bolt onto stuck wheel with tire tool. Specify make, model, year, lug number & ton rating. \$49.95 F.O.B. (cable not included) - SO. TEX. HUNTING CLUB, FIRST NATIONAL BANK BLDG., DEPT. A, SAN ANTONIO, TEXAS 78201

RAZORBACK HOGS

**Authentic Purebred Stock
Wildstocking or Table**

Bred Sows \$110.00
Shoaly Pigs \$ 35.00

1 or 100 Animals

Jack Rogers — Rogers Chevrolet Co.
Palestine, Texas AC 214-729-6928

TEXANS HELP YOUR HUNTING THIS YEAR

**PORTABLE DEER STANDS
CANVAS TENT COVER**

- *DISCOUNT
- *QUANTITY
- *PURCHASES

PRICES F. O. B. TYLER

PLUS 4% SALES TAX

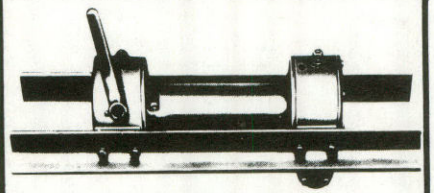


MODELS PICTURED	DS 100	DS 200	DS 350
PRICE & HEIGHT	12' \$89.50	14' 6" \$101.00	21' 6" \$218.50
ANOTHER FINE PRODUCT	DS 50	DS 250	DS 300
	CANVAS ONLY \$65.00	WITH CANVAS \$161.00	W/OUT CANVAS \$153.50
	CANVAS WITH STAND \$60.00		



FOR FREE BROCHURES & INFORMATION
WRITE
P. O. Box 686, Tyler, Texas 75706
PHONE 597-9422 or 592-2581 - nights
LOCATED
2 miles North of Loop 323 on Hwy. 69 N.

SLIP OVER CANVAS MADE OF 12 OZ. POLYESTER FABRIC THAT WILL NOT MILDEW. ZIPPER & SNAP WINDOW FLAPS TO COVER THE FOUR 20 GAUGE CLEAR VINYL WINDOWS.



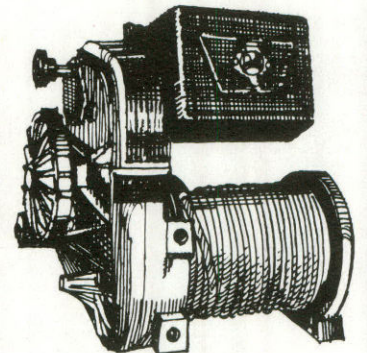
Ramsey PTO & Electric Winches

Call or Write for Details

E. N. Dean Supply Co.

1515 Rogers St.
San Antonio, Texas 78208
512-226-8231

DISTRIBUTOR



Warn Electric Winch

LIVE-CATCH TRAPS and CAGES



Low as \$4.95
Write for FREE CATALOG

Traps without injury squirrels, chipmunks, rabbits, mink, fox, raccoons, stray animals, pets, etc. Sizes for every need. Also traps for fish, sparrows, pigeons, turtles, quail, etc. Save on our low factory prices. Send no money. Write for free catalog and trapping secrets. MUSTANG MFG. CO., Dept. N-37, Box 10880, Houston, Tex. 77018

AUTOMATIC GAME FEEDER

Feeds up to 12 times a day. You select time and amount. 300 lb. capacity. 12-volt dry battery included. Thousands in use nationwide.

WRITE FOR
FREE BROCHURE TODAY
SWEENEY ENTERPRISES, INC.
ROUTE 2, BOX 145G • Dept. TP
BOERNE, TEXAS 78006 (512) 537-4244



DEER HUNTERS

Millions of acres available *free* for hunting throughout Texas and U.S.A.. Book tells where and how. Price only \$3.95 + 55¢ handling. Guaranteed to please. Order today!

Judge J. W. Mahan, Ret.
500 Malone. P. O. Box 306
Tomball, Tex. 77375.

THE ORIGINAL LEHMAN

AUTOMATIC FEEDER

Fishermen • Hunters • Birdwatchers
Time Tested—Over 7,500 Sold!

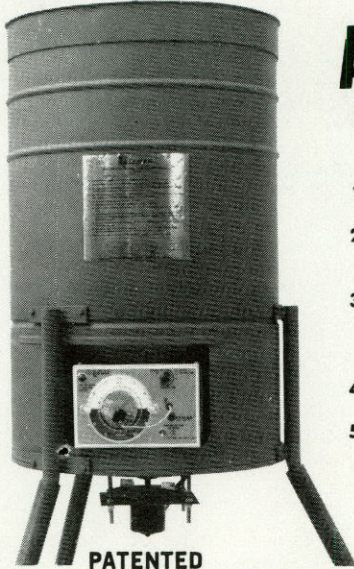
1. New 24-hour 4-jewel movement.
2. Feed one or more times day or night any selected time regularly unattended.
3. Distributes feed 25 to 75 ft. — depending on installation height. Install suspended — or on pipe legs.
4. Operates on 6 volt dry cell — 2 to 6 mos.
5. Capacity 250 and 1,000 lb. sizes.

Write for Free Brochure

LEHMAN H FEEDER & PLOW, INC.

Route 3, Box 53, Corpus Christi, Texas 78415

(512) 855-0049



PATENTED

NOW!

Varmint Hunter's
**NO-SCARE
RED BEAM
Headlight**



Tested and proved by BURNHAM BROTHERS

Varmint callers — bring wild critters right up to you at night! Tests prove that varmints can't see red light — they'll come to your call, even with light shining. Try it! Sturdy "no-scare" lamp is mounted on adjustable headband. Has variable bright-dim switch. Uses 6-volt lantern battery. For new calling kicks, order now. **Money-Back Guarantee.** Complete with case, less battery, only \$12.45. Without case or battery, \$10.45. Add 50¢ for postage. Ask for NEW FREE CATALOG!

BURNHAM BROTHERS

P.O. Box E-117-HL Marble Falls, Texas 78654



TEXAS HUNTER® For Vantage Point with Comfort!

LIGHTWEIGHT

ALUMINUM TRIPOD
STAND WITH SWIVEL
SEAT. FOLDS FOR EASY
CARRYING.



COMPLETE ON 10' STAND.
44 LBS. \$114.00



WARM, DRY ENCLOSED DEER BLIND



SINGLE BLIND 4' x 4'

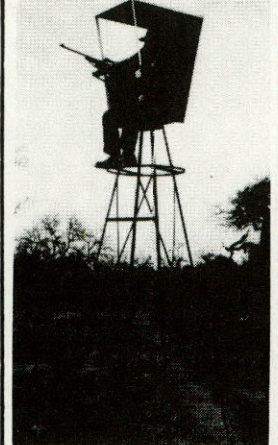
Without Tower \$129.00
on 10' Tower \$208.00
on 15' Tower \$268.00
on 20' Tower \$359.00



SIAMESE BLIND 4' x 8'

Without Tower \$232.00
on 10' Tower \$355.00
on 15' Tower \$435.00
30" Steel Stakes \$1.00 ea.

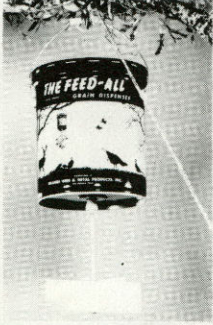
SWIVEL HIGH CHAIR



On 10' Stand \$120.00
On 15' Stand \$167.00

FEED-ALL

Pat. #2,972,334



THIS ITEM PREPAID
\$8.95 plus 5% Tax

SWIVEL
ARM
CHAIR
\$20.00



• Prices F.O.B. San Antonio, plus 5% Sales Tax • Discount On Quantity Purchase

FOR FREE BROCHURE AND INFORMATION WRITE:



BRADEN WIRE & METAL PRODUCTS, INC.

1310 West Laurel St. — (512) 734-5189
P. O. Box 5087 — San Antonio, Texas 78201



Automatic Feeder \$217.50
10' Legs w/stakes \$28.00

Young Naturalist Hermit Crab

by Ilo Hiller

While picking up shells at the water's edge, you may suddenly find one that seems filled with legs and feelers (antennae). If so, you have come face to claw with the hermit crab.

This interesting creature, which resembles both crab and lobster, is not a true crab. It belongs to the distinct group of crustaceans called *Paguridae*. It has a shell-like head and fairly strong claws, but its rear portion is soft and has no protective shell covering. For this reason, the hermit crab is forced to find an empty marine shell it can back into. Its soft rear portion, which molds to fit the shell's inside curves, has a pair of hooks (uropods) that are used to grip the inner part. Once the hermit has latched on to its borrowed shell, it is almost impossible to remove it. In fact, the crab will let itself be pulled apart before it will release its hold.

When undisturbed, the hermit crab comes partly out of its shell and creeps along carrying the shell on its back. The soft abdomen remains inside for protection. Its eyes, at the ends of their stalks, are always on the lookout for danger. When attacked, the hermit quickly retreats into its shell. If the shell is big enough for its whole body, the crab uses its big claws to fill the doorway and protect its head from harm.

To learn more about the hermit crab, let's follow one through its life cycle.

The hermit crab larva, known as zoea (zo-EE-a), hatches from an egg about the size of a pencil dot. Its tiny body, which looks nothing



Bill Reaves

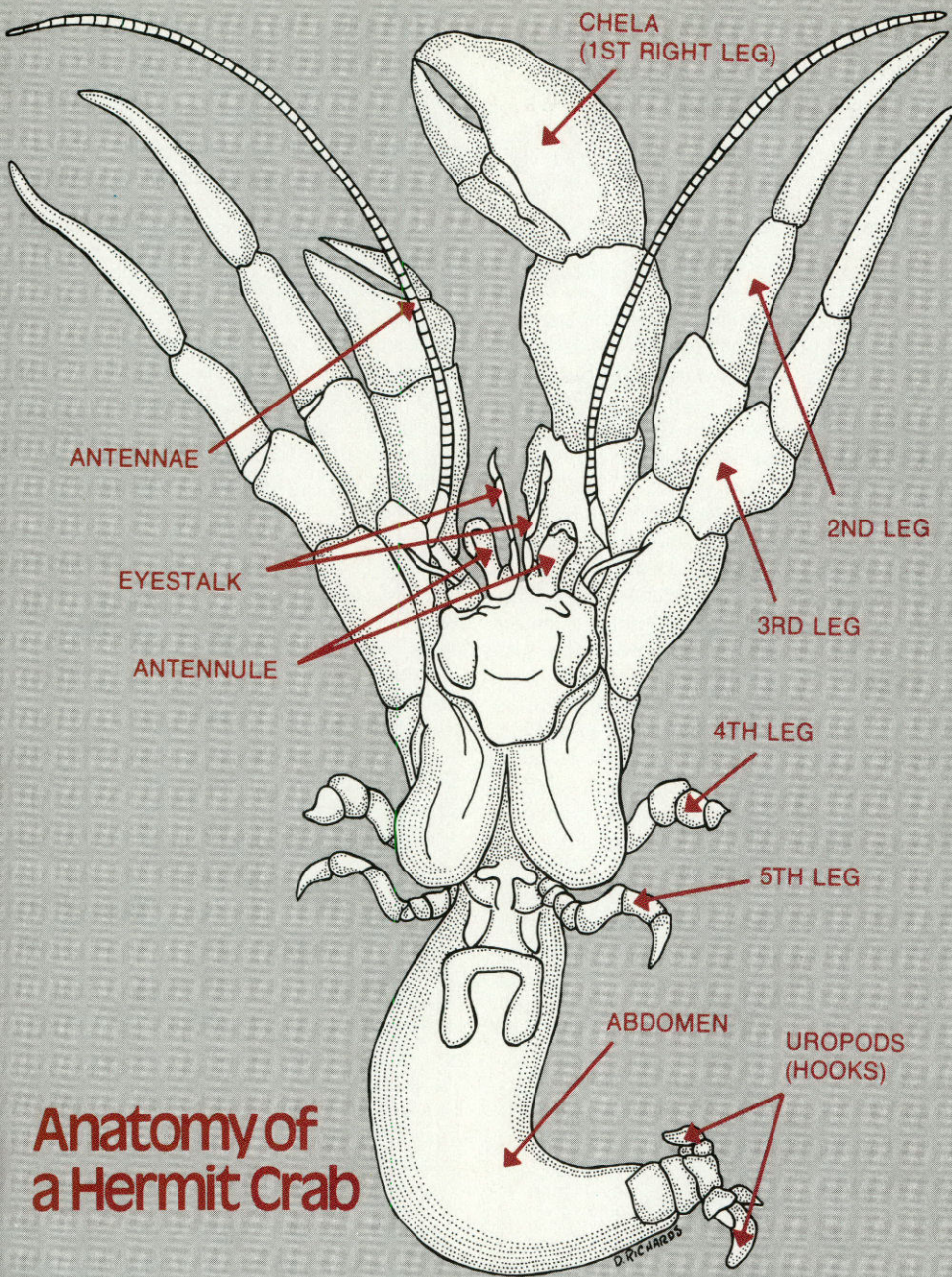
like an adult hermit crab, is almost transparent and practically invisible in the water. It can be described as two large eyes on a slender body that is all points, joints and feathery places.

As the zoea drifts near the surface, instinct causes it to start using its mouth parts to feed on diatoms (DI-a-toms) and other microscopic plant life floating in the water. With feathery, leglike appendages, the zoea stirs the water and pushes the food into its mouth.

The outside of the zoea's body is covered with a tough, crusty shield, called an exoskeleton, that cannot stretch or grow. When the exoskeleton gets too tight, it splits open and the zoea wriggles free. Its soft, wrinkled body expands to its larger size and a new outer crust forms. This process, known as molting, happens several times during the zoea's first few weeks of life.

Each time the zoea emerges a little bigger and slightly different,

Anatomy of a Hermit Crab



but one day it emerges quite different. Its eyes are now on stalks that swing independently and see two ways at once. Feathery appendages (antennules) still help steer food into its mouth, but the new body has 10 jointed limbs. The two in front move like arms and have pincers. The right one (chela) is larger. The lower half of its body consists of a strong abdomen ending in a tail paddle. At this stage of development, the hermit crab looks much like a tiny crawfish or lobster. A slap of its tail sends it scooting through the water after food or away from danger.

From this stage, it molts into the

true hermit crab shape. The powerful tail paddle disappears from the well-balanced abdomen and the creature is left with a naked, swollen-looking rear portion that is slightly curved to the right side. To survive, the young hermit crab must find an abandoned shell that will protect its tender backside. Its first shell may be less than a centimeter in length.

A lifetime of shell-swapping now is in store for the hermit crab. As it grows it must constantly find a larger one, but it also is always on the lookout for a shell that is better than the one it has. The new shell could be a more perfect one of the

same species, or one with a different shape. It might be more brightly colored or perhaps decorated with seaweed or barnacles.

Whenever the crab decides it is time for a change for whatever reason and finds a shell that seems suitable, it must try the new one on for size. This is a dangerous maneuver because for a moment its unprotected backside is exposed. To lessen the danger of being snapped up by a passing bird or fish, the hermit crab brings the occupied shell very close to the door of the new shell. Once the shells are in place, and after a quick look around, the crab pops into the new shell. If for some reason it isn't suitable, a switch back to the old shell is made.

The hermit crab that survives the unprotected stages of its life and manages to avoid being eaten during its many shell swappings eventually reaches adulthood. At the proper time, instinct causes the male hermit to seek a female. If the one he finds is also found by other males, claw battles and tugs-of-war over the female's shell result.

The winner drags away the female's shell, with her inside. The two may then spend several days patting and caressing each other before the female molts and mating occurs. After mating they go their separate ways. The female lays her eggs and they hang in clusters along her body. She rocks gently inside her shell to clean and air the eggs with bubbly salt water. When they are ready to hatch, she releases them into the water. From each one a new zoea emerges to start the cycle again.

Next time you visit the beach, look for the hermit crab. It could be inside the first pretty spiral shell you pick up. **

LETTERS TO THE EDITOR

Change of Editor

Neal Cook, editor of *Texas Parks & Wildlife* for seven years, has left to enter private business. He will be missed. With this issue David Baxter assumes the duties of editor. Baxter has been news editor with the department for the past five years; before that he was assistant and associate editor under Cook.

License Expiration

Why has the Parks and Wildlife Department decided to return to a once-a-year expiration date for fishing licenses? It is my opinion the rotating system was not given a fair trial period. To my recollection it has been only about two years.

Surely you are aware that most of us had to drive for miles to find a store that was not sold out of licenses when starting on a Labor Day fishing trip or when packing for opening day of deer season.

Geo. M. Fern
Pineland

■ Parks and Wildlife Department statutes for hunting and fishing licenses are

determined and enacted by the Texas Legislature. The general public has expressed a preference for consistent expiration dates which eliminate their having to remember when to renew their licenses. Most prefer to buy hunting and fishing licenses at the same time each year.

The number of fishing licenses sold has declined since 1974, the year a change in law made licenses valid for one year from date of issuance. The number of citations issued by game wardens for no fishing license also has increased considerably.

By reprinting licenses each year the color of the license can be changed. This has proven to be a convenience to both wardens and fishermen. At a glance wardens can tell by color if a license is valid without having to board a boat or further interrupt a fisherman.

When fishing licenses were valid for one year from date of issuance, sales deputies had to write in the issue date manually on the face of each license sold. Dishonest individuals took advantage of this and often changed the date.

Proper Deer Tagging

I hunt in South Texas five to six hours' drive from my home. When I kill a deer I tag, gut, skin and quarter it and pack the quarters in an ice chest. I keep the head with antlers and tag attached while traveling home. The reason I go to all this trouble is to retard spoilage and avoid loss of meat.

Game wardens have stopped me four times. Twice officers said I was breaking the law, but allowed me to go with only a warning.

On the other two occasions I was praised by the wardens for my method of transporting the deer.

Who's right, the first two officers or the second?

Dan Barosh
Van Vleck

■ Under current regulations you are permitted to skin, gut and quarter a legally taken deer and transport it to a commercial processing facility or to your permanent residence. You must keep the properly completed hunting license tag, antlers, or antlerless deer permit, with the quartered deer until it arrives at the commercial processing facility or your permanent residence.

Search for Photographers

We are trying to determine the whereabouts of four free-lance photographers whose wildlife pictures were published in our magazine a few years ago. If you have a current address for Rex Schmidt, Bill Wilson, John Dyes or Terry Fischer, please write directly to the editor, 4200 Smith School Road, Austin 78744.

TEXAS PARKS & WILDLIFE

Send check or money order to:
TEXAS PARKS & WILDLIFE
4200 Smith School Road, Austin, Texas 78744

Check one

RENEWAL

Paste your last magazine address label into space indicated and mail with payment.

CHANGE OF ADDRESS

Paste recent magazine label into space indicated, show change on form and mail.

NEW SUBSCRIPTION

Fill out form at right and mail with payment.

GIFT SUBSCRIPTION

Show recipient's name and address in form, indicate gift signature and mail with payment.

Attach recent magazine address label here for renewal or change of address.

Name _____

Address _____

City _____

State _____

Zip Code _____

Sign Gift Card

CHECK ONE 1 yr. \$5 2 yrs. \$9

Out of U.S. (except APO and FPO) 1 yr. \$6. 2 yrs. \$11.

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

BACK COVERS

Inside: Afternoon sunlight gives a golden glow to the spines of the common prickly pear. Take advantage of back lighting to produce different effects in your outdoor photography. Photo by Jim Whitcomb.

Outside: Whether perched in the top of a tree or running along the ground at top speed, the roadrunner is a common sight to many Texans. When the bird takes to the air, its flight is fitful and seldom sustained for very long. Photo by Bill Reaves.



