

# TEXAS

PARKS & WILDLIFE

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## OUTDOOR NOTEBOOK

A spiny evergreen of the Rio Grande Valley, Texas ebony is prized as a shade tree and as a source of fence posts. The durable wood is also used in cabinet work. Its woody seed pods are the delight of flower arrangers. Dense foliage and fragrant blossoms make it an attractive ornamental. The seeds are edible—boiled when green or roasted when ripe. Ebony, *Pithecellobium flexicaule*, also called ebony apes-earring, grows as a shrub or tree. The largest ebony in Texas (40 feet high) grows in the Santa Anna National Wildlife Refuge near McAllen. Leaflet at upper left with blossoms is actual size.

—Nancy McGowan



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**TEXAS PARKS & WILDLIFE  
magazine**

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

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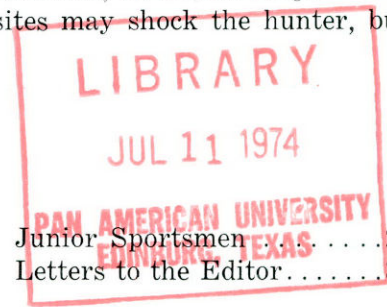
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**TEXAS  
PARKS & WILDLIFE**

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


**Cover:** Canada geese may make up only a part of the hunter's limit. To help hunters keep from exceeding that and other waterfowl limits, a twilight hunter's guide appears on page 16. Photo by Reagan Bradshaw.











# DEER CENSUS LINES

by  
Elroy L. Young, Jr.

Wildlife Biologist

A **FREQUENTLY** asked question of wardens and biologists in Texas is: "How do you guys know how many deer are in an area?" The answer to this puzzle also explains why a hunter may discover yellow paint on a tree near his stand, and why game department men ask landowners' permission in late summer to walk a couple of miles in the heat.

Deer populations in many parts of Texas are estimated by the "Hahn Cruise Census" method. This technique involves a line two miles in length through deer habitat. It is situated in an east-west direction by compass reading.

Once the most desirable site for a line is located in a given area, it is marked and measured. A biologist and two assistants walk the line and paint it—just enough paint on posts, trees, rocks, etc., so





# DEER CENSUS LINES

*Records kept by biologists allow the estimating of the number of deer per acre in an area. This makes possible the best distribution of antlerless deer permits.*

that a person unfamiliar with the country could follow it easily. The line is then measured so that the total acreage on which it is possible to see a deer is known. The observer, from the blazed course, stops every hundred yards (usually paced) and sends the assistants out at right angles to the line. When a white flag in each man's hip pocket (the approximate height of a fleeing deer) disappears, the number of yards to that point from the line is recorded. After this is done for the entire two-mile strip, the number of visible acres is determined. The length in yards (3,520) is multiplied by the average width; this figure is divided by the number of square yards in an acre (4,840).

Then, before deer season, one observer walks the line from west to east during the last hour of daylight and records the number, sex, and age class of the deer that he sees from the line. Deer usually are most active during this time of day, and, with the sun behind him and low, the observer has a good chance of seeing the deer before they know he is around.

Later, the number of deer that are seen on the line is divided into the number of visible acres which has already been determined. The biologist

now has an acre per deer figure that he can use as a basis for estimating deer populations and managing the deer herd. In areas of high deer populations, such as exist in many parts of Texas, it may be necessary to harvest antlerless deer. It is important to reduce deer numbers when it appears that they are overgrazing the available food in the area.

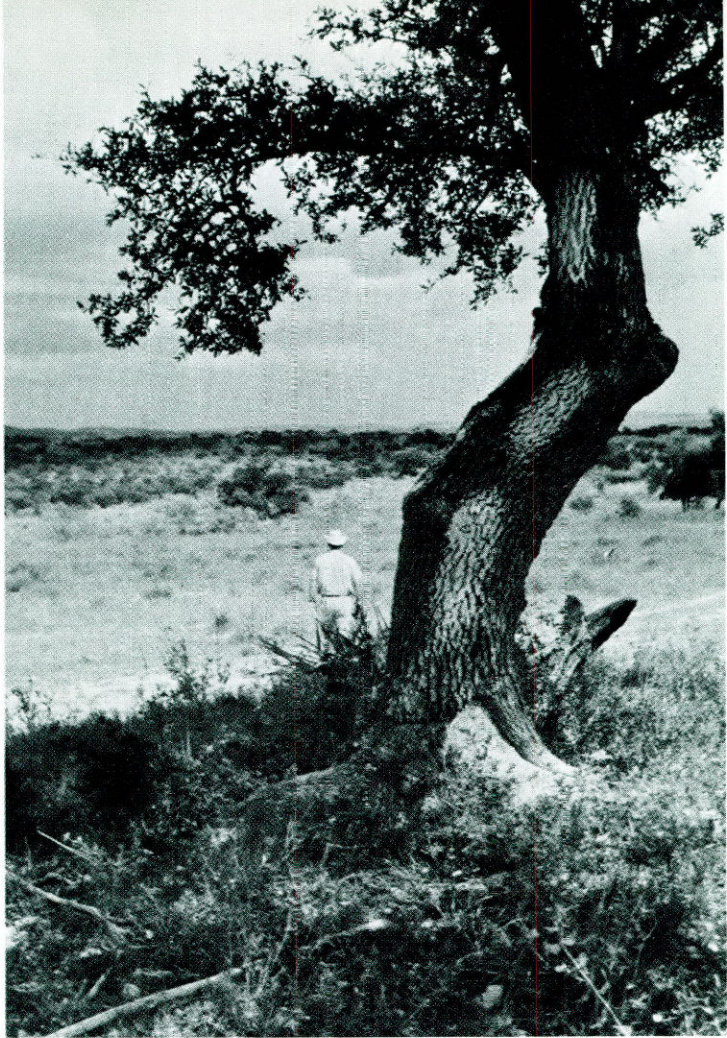
Besides the obvious factor of starvation, other detrimental effects of overpopulation become evident. Deer become less wary of the hunter because of the constant search for food. Animals in the herd are reduced in size because of malnutrition. Disease, if present, is spread rapidly because of the close contact of the animals and their loss of vigor, and is likely to wipe out the weakened herd. Other less obvious effects are soil erosion and damaged habitat caused by denuding and close-cropping of all edible vegetation from range plants.

By controlling the size of the deer herd, and allowing antlerless deer to be killed when necessary, the Parks and Wildlife Department attempts to obtain the maximum use of our wildlife resources, and to maintain healthy animals. As a result, both the hunter and landowner benefit. \* \*





*Yellow paint dabbed on rocks  
and trees mark the trail for  
biologists to follow in the census.*











# turkey Fundamentals

by Charles E. Boyd

and Ray Hart

Wildlife Biologists

**CERTAIN** practices of land management can serve to increase a shootable population of wild turkey in Texas. The turkey is the largest game bird in the State, and its welfare must not be taken for granted. Just as in other forms of wildlife, food, cover, and water are necessary for its survival.

For the purpose of this article, habitat improvement practices will be described for two of the three strains of wild turkeys found in our State. These are the Rio Grande—western strain—and the eastern strain. The third strain, Merriam's

turkey, is found in several locations in the far western part of the State in very small numbers.

The Rio Grande strain of wild turkey is found throughout much of the State, from the Panhandle to the Rio Grande Valley. Thousands of these birds have been trapped and transplanted through the years, and they have been able to adapt and reproduce satisfactorily everywhere except that portion of the State north and east of the Brazos River.

In the Hill Country there is a great need for unintruded or isolated areas for nesting. Land which





*Favorite roosting sites are trees with large branches 10 to 25 feet from the ground.*

has been stripped clean of ground cover from excessive use by livestock can provide no suitable nesting cover and very little, if any, necessary food. Land deferred from grazing or moderately grazed will support higher turkey populations than land depleted by overgrazing.

While the clearing of prickly pear is good for livestock production, prickly pear eradication removes a valuable source of food for wild turkey. The practice of clearing and chaining can be designed so as to be advantageous to wild turkey as well as livestock. Cleared and chained areas should be small and irregular in size and shape. A danger in these practices that the landowner should be aware of is the reduction in oak mast and cedar berries while clearing. These are a valuable late winter subsistence diet for turkey.

Fencing off the corners of pastures to prevent the entrance of livestock can provide valuable nesting areas for turkey. "Block" clearing in areas heavily infested with cedar and hardwood brush is believed to be an advantage to turkey. Here again, the cleared areas should be small (three to five acres), and arranged in a checkerboard pattern. Research in South Texas indicates that high, if not maximum densities of wild turkey can exist where only 25 to 35 percent of the land is left in irregular native brush tracts.

Supplemental feeding can often hold large numbers of turkey when the food is provided near available water and roosting sites. Corn is the most

desirable grain for use in supplemental feeding. Although it should never actually be depended upon to *replace* the natural diet of the birds, it can be extremely valuable in severe winters, or seasons of extreme drought.

Fall plantings of oats, rye, vetch, clover, and chufas are eagerly accepted by wild turkey, and can provide an indispensable asset to their diets.

In the Panhandle and South Texas, turkeys inhabit major stream areas where timber is large enough to provide adequate roosting sites. Any destruction of large trees along these streams will harm resident flocks of turkey.

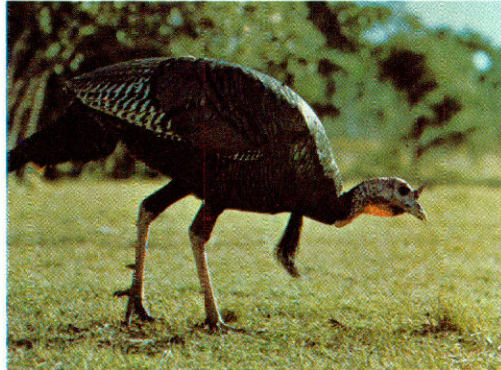
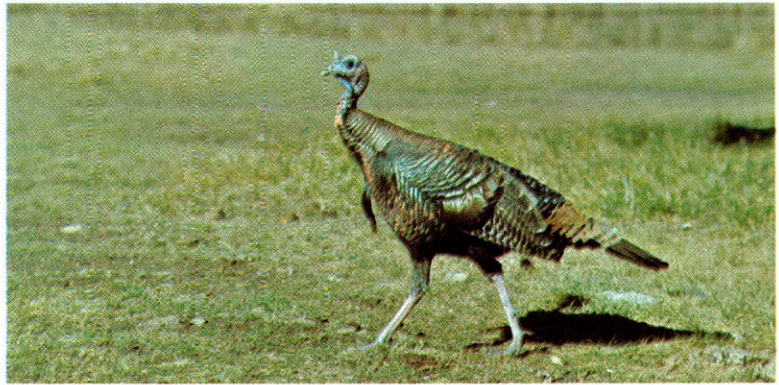
North and east of the Brazos River an effort has been made to restore the Eastern wild turkey to the range it formerly occupied. Eastern turkey were secured from Georgia, Florida, and South Carolina from 1959 to 1962. A total of 82 Eastern turkey was released on selected sites on the Neches River watershed in Trinity, Tyler, Hardin, and Jasper counties. From these restocked areas 65 Eastern birds have been trapped and placed in turkey restoration areas in Robertson, Cherokee, Harrison, Houston, Leon, Newton and Freestone counties.

Eastern turkey spend the winter period in river bottomlands and in large, mature timber stands; then travel to well-drained upland sites in the spring to nest. Important winter foods are the mast of oaks, haws, and many other fruit-bearing trees. Favorite roosting sites include large white oak, beech, cypress, and other trees with large branches





Photos by Leroy Williamson



*Landowners and sportsmen must cooperate in improving habitat to insure wild turkey in huntable densities for future generations to enjoy.*

10 to 25 feet from the ground. Some of the favorite nesting sites are on well-drained, grassy knolls with some thickets, near old fields, at the edge of pine thickets, along fence rows, and adjacent to pipelines.

The importance of well-drained, secluded, and undisturbed nesting sites to Eastern wild turkey hatching success cannot be overemphasized. Next to year-round, adequate food supply, this is definitely the most important factor to successful turkey restoration.

Native forage such as oak mast, dogwood, haws, and other such foods should be retained and cultivated when and where possible. Critical shortages of this native food cannot be compensated for by scattered food patches or supplemental feeding. However, food patches and feeding are helpful in carrying wild turkey over short periods of natural food shortages.

Some of the most beneficial food plots are commercially fertilized areas of one to five acres in size planted with varieties of oats, clovers, chufas, millet, peas, vetch, and sorghum alnum. Another method to encourage Eastern turkey is to clear and selectively cut areas one to two acres in size to allow native, mast-bearing trees to produce heavier acorn and fruit crops. The important factor about strip clearings, spot clearings, scattered controlled burn areas, food plots, and selective cutting areas is their placement at strategic locations and at times during critical periods. A super abundance of

food at one time and place does not compensate for shortages at another time or place.

The supplemental feeding of corn and other foods when native food is scarce is an important practice to reduce turkey movements on restocked areas. These feeding sites may be small fenced areas of one-fourth to one-half acre in size to prevent livestock use, or they may be artificial feeders. The use of small fenced areas has been more successful with the Eastern turkey.

On upland sites where summer water is scarce, small push-up water impoundments holding water for many months have proven effective.

An adequate year-round food source is very important, and any practices placing more food on the ground can be beneficial to Eastern turkey restocking efforts.

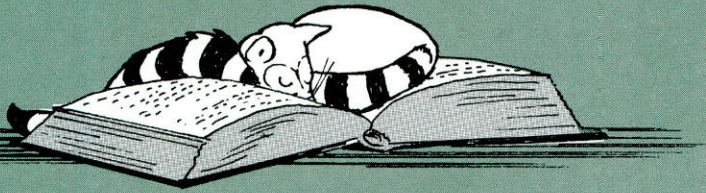
Wild turkey management in Texas requires the encouragement of native food and cover plants, adequate and proper timber-wildlife coordination operations, and a continuing restocking and restoration program. The understanding and cooperation of both the concerned land manager and the sportsman are required if wild turkey are to remain in the hunting picture. This fine game bird deserves the consideration of all who are interested.

Texas can be justly proud of its flocks of wild turkey, both native and transplanted. A little habitat improvement will go far to assure that the majestic birds will be on the scene for generations to come.

\*\*



# Outdoor Books



**TEXAS PUBLIC CAMPGROUND GUIDE** compiled by the Texas Highway Department; Travel and Information Division, P. O. Box 5064, Austin, 78703, 1969; 16-page folder, free.

From Abilene to Zavalla, 350 public campsites throughout the State are included in a handy folder for campers and travelers. Arranged alphabetically by the city nearest the campsite, each listing explains location, facilities, activities, fees (if any), and maximum length of occupancy. In addition, mailing addresses for each camp are given for those who might wish additional information or would like to make reservations.

The list includes only public, tax-supported campsites—federal, state, county, and municipal. But these run the range from primitive, undeveloped areas for the wilderness camper, to 20th century accommodations for lovers of running water, electricity, and flush toilets.

Easily kept with maps, this folder is an invaluable car companion for both the weekend camper and the cross-country traveler who shuns motels for the pleasures of camping along the way.—*Suzanne Winckler*

**THE WAY BIRDS LIVE** by Edward A. Armstrong; Dover Publications, Inc., New York, N. Y., 1967; 97 pages, illustrated \$1.50

Perhaps from a bird's point of view, life is complicated to him also, but from man's standpoint it appears happy and free.

In a concise, interesting, somewhat humorous, and informal manner, the author presents a colorful sketch of the way birds live. The reader learns, for example, that the song of birds is not only the music of the forest, but that it holds purpose and meaning in the life of birds.

*The Way Birds Live* is a lively account of the author's observations. It is his opinion that watching birds is the best way to see their world, but he stresses that we should not look for human qualities in birds in order to

understand them. Comparisons can be made between the actions and emotions of birds and those of man, but it must be remembered that birds are governed by instincts while man forms habits; however, each learns from his elders, and gains perfection in his actions through experience and age.

The first time a bird builds a nest it is not going to be the best he will ever build. A bird learns by practice and imitation whether it be singing, preening, feeding, or any of the other daily rituals performed. Armstrong links what is happening inside the bird as well as what is happening on the outside with what it feels and what it sees.

In many ways the author uses his book as a means to promote birdwatching as a pastime. In telling about his many observations of many different kinds of birds, he conveys to the reader some of the things unknown about them and gives the reader an incentive to observe their habits. Most of all he gives a remarkable insight into the fascinating and eccentric behavior of birds and the role they play in the balance of nature.

The book is keenly illustrated with drawings and photographs, such as that of the Adelie penguin "proposing" and a cuckoo robbing another bird's nest. One of the most heartwarming and amazing illustrations shows a cardinal feeding goldfish.

Anyone who takes delight in observing some of nature's most beautiful creatures will find this book interesting and enjoyable.—*Wanda Freytag*

**THE STARS** by H. A. Rey; Houghton Mifflin Co., Boston, Mass., 1967; 160 pages, \$6.00

Stargazing is free, can be done in the cool of night, and doesn't take great physical dexterity. Yet most people can point out only a few celestial bodies—usually the Big Dipper, the North Star, and the evening star which is really the planet Venus. City-dwellers have a good excuse. City lights tend to water down a black sky—the perfect back-

drop for good, glittering stars—and houses and buildings limit the field of vision. But people in small towns and rural areas of the State and those willing to exit the metropolis, have grand expanses before them. The stars are indeed big and bright in Texas.

For those who would like to add to their star knowledge, *The Stars* is an excellent first step. It is directed to those people who perhaps have heard of Cassiopeia, Cepheus, Andromeda, and Gemini but couldn't begin to find them in the sky. Many astronomy books use geometrical figures to chart constellations. However, in *The Stars*, Rey depicts constellations graphically, thus giving relevance to their names and shape. These simple, readable charts give the stargazer a mental picture of what he will be looking for in the sky.

Seventeen charts show different segments of the sky each with three or four constellations, name the important stars in each group, and give the magnitude—apparent brightness—of these stars. Accompanying each chart is an explanation of the constellations, when they can best be seen, and in many cases how they were named. One of the finest attributes of the book is the quantity of facts—both interesting and entertaining—it contains. Even if the reader never looks skyward, he will have picked up an amazing amount of information about stars.

After dealing with the when and where of stars, Rey introduces some whys and hows; the astronomical facts that usually frighten off people not inclined to science or math. If the reader wishes, he may skip this portion of the book and still be a successful stargazer. But so much is explained, so well, that to pass it by would be to miss out on even more fascinating information about our galaxy.—*Suzanne Winckler*

Answers to Tutor Topics from page 31:

1-g	2-h	3-f	4-d
5-c	6-e	7-a	8-b

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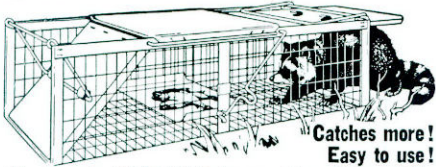
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# Long Shots, Short Casts

*compiled by Neal Cook*

**Cooking Out DDT:** DDT residues in fish can be reduced by 55 percent by deep frying, according to a Wisconsin Department of Natural Resources study. The study also showed that 36 percent of the residues can be removed by boiling, 25 percent by pan frying, and 11 percent by baking. To remove the highest levels of DDT, fillet, skin, and deep fry the fish. The oil used for cooking should then be discarded. The study also noted that although larger fish had the highest levels of DDT, they also lost a greater percentage of these residues in cooking. To determine the effects of different cooking methods on DDT, a meal-sized portion of fish was cooked using various methods, and then these cooked samples were paired with a similar uncooked portion of the same fish and the samples were tested for DDT residues.

**Use Those Plastic Bottles:** Plastic bottles often used around the house can be made into many helpful items for the fisherman. They can be made into bailing scoops, bait cans, tool storage boxes, or they can be filled with water, frozen, and used in an ice box for cooling purposes. However, they should not be used to carry drinking water or other consumable liquids.

**Rabies Reminder:** Rabies is a year-round disease of which anyone venturing into the outdoors should always be aware. Some logical precautions can help protect against rabies infection. Never attempt to catch or handle wild animals. Beware of "friendly" wild animals—a fox, skunk, or other wild animal that wanders into camp and seems to have no fear of humans often indicates rabies infection. If bitten by any animal, clean the wound and seek medical attention, and always try to kill or capture the animal involved to allow examination. In killing an animal for this purpose, do not shoot it in the head, and keep the body cool but not frozen. Remember that rabies is a fatal disease, but it is controllable with prompt medical attention. A note for those who have heard stories and fear the "dreaded" rabies treatment; modern science has modified the treatment to nothing more than a series of pin pricks causing very little discomfort.

**Freak of Nature:** Antlered doe deer turn up about once in every 3,000 bucks checked by biologists throughout the nation. The antlers of doe usually remain in velvet while those of bucks become mature polished racks.

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*A replica of a Spanish mission originally built in 1690 is in the center of this 118-acre park located in East Texas' piney woods. Visitors can enjoy hiking, camping, picnicking, or studying history in the park.*



John Suhrstedt

*A small lake in the park offers anglers bass and sunfish.*



Reagan Bradshaw





# Mission

SAN FRANCISCO DE LOS

# Tejas

STATE HISTORIC PARK

by  
Neal Cook

**PINE** scented breezes rustle the trees and an occasional bird sings his greeting from high overhead. Often these are the only sounds that visitors to this park hear. Well off the main traffic arteries, Mission San Francisco de los Tejas State Historic Park offers picnicking, camping, fishing, history, or walking along peaceful trails through the woods.

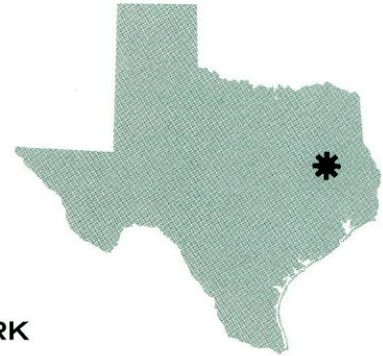
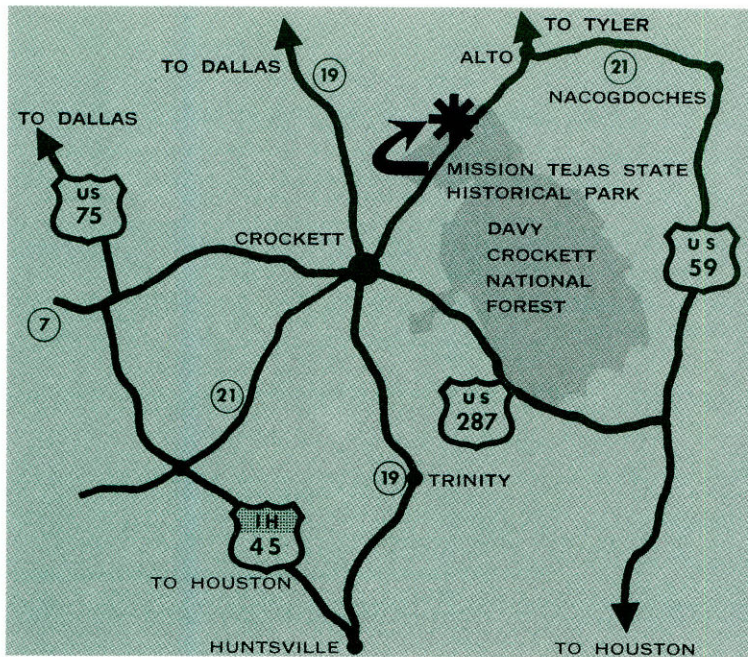
Located near the community of Weches in Houston County, about 120 miles directly north of Houston, this 118-acre park was acquired by the Parks and Wildlife Department in 1957 from the Texas Forest Service.

The park contains a replica of a Spanish mission established in 1690 to bring the Christian religion to the Tejas Indians living in that area.

Prior to this time the Spanish had concentrated their missionary work in the western portion of the State, but in 1685 word was received in Mexico City that the French were establishing a colony on the Texas Gulf Coast and planning to settle other parts of East Texas. To protect their claim on the eastern part of what is today Texas, the Spanish decided to use missions to bring Christianity to the Indians and to establish definite colonies.

In 1690 an expedition led by Alonso de Leon came from Mexico to the village of the Nabadache Tribe of the Hasina or Tejas Indians. (*Tejas* came from the Hasinai word *techas*, meaning friend.) Accompanying De Leon were Father Damian Massanet, three other priests, and more than 100 soldiers.





### MISSION TEJAS STATE HISTORIC PARK

Father Massanet, a Franciscan priest, had met the Indians on an expedition to the area a year earlier. De Leon's expedition arrived at the chosen site of the mission on May 24, 1690. The original site of the mission was in dispute for many years until a cannon was plowed up by a farmer in 1933 and identified as one left by the Spanish soldiers at the mission. The replica of the mission in the park is near this site, but the exact location of the original is still unknown.

After construction was completed and the priests had begun their work, De Leon and Massanet returned to Mexico, leaving the three other priests with three soldiers and many supplies. De Leon and Massanet gave glowing reports in Mexico City about the successful establishment of the mission and the government decided that they should return to the area and establish more missions to continue exploration.

But while the leaders were giving reports of the mission's success, the missionaries themselves were having difficulties. The soldiers who had been left to defend the priests had become hard to control and were creating bad relations between the Indians and missionaries. Droughts had caused two years of crop failures, and a disease had killed several Indians and many of the mission's cattle. The Indians blamed the droughts and disease on the Spanish and—while not openly hostile to the missionaries—they took every opportunity to steal from the mission.

When Massanet and an expedition led by Domingo Teran de los Rios returned to the mission, they found it deteriorating. Teran left Massanet

and a few soldiers and returned to Mexico in January 1692.

In June 1693, Captain Salinas de Varona arrived at the mission with supplies from Mexico, and by this time conditions had become even worse. Some of the missionaries chose to return to Mexico rather than stay in East Texas. After continued bad reports, the viceroy in Mexico City decided in August 1693 that the mission should be abandoned.

On the night of October 25, 1693, the missionaries buried the bells, cannons, and other property that could not be easily transported back to Mexico, burnt the mission, and returned to Mexico.

The present park commemorating this attempt by the Spanish to settle East Texas is located in the Sam Houston National Forest, and the first replica of the mission was built by the Civilian Conservation Corps in 1934. The park and mission were under control of the Texas Forest Service until 1957 when the State Legislature put the park under the jurisdiction of the Parks and Wildlife Department.

Recently completed construction at the park has greatly increased its recreational capability with additional camping and picnicking areas. There are now 10 picnic sites adjacent to a three-acre lake. Also, there are 10 campsites and five trailer campsites with water, electricity, and sewage connections. There are no camping supplies available in the park, but bait and groceries are available in nearby Weches.

The vacationer who looks for peace and quiet could find few places in the State to match Mission San Francisco de los Tejas State Historic Park. \* \*



# Your Texas State Parks

	Located Near The Town Of	Camping	Screened Shelters	Group Facility	Trailer Sewer Facilities	Trailer Water and Electricity	Restrooms	Showers	Cabins	Picnicking	Groceries	Prepared Food	Fishing	Swimming	Water Skiing	Boat Ramp	Museum and/or Exhibit	Miscellaneous	Historic Structure
<b>Recreation Parks</b>																			
Abilene	Buffalo Gap	●	●				●	●		●			○	●	○	●	Texas Longhorn Herd		
Atlanta	Queen City	●			●	●	●	●		●				●					
Balmorhea	Toyahvale	●			●	●	●	●	●	●				●					
Big Spring	Big Spring			P			●	●		●								D	
Blanco	Blanco	●	●		●	●	●	●					○	○					
Bonham	Bonham	●		C			●	●					○	○		●			
Buescher	Smithville	●	●	H			●	●					○	○				D	
Cleburne	Cleburne	●		C		●	●	●		●	●		○	○		●		B	
Copano Bay	Rockport						●	●			●		●	●		●			
Daingerfield	Daingerfield	●			●	●	●	●	●	●			○	○	○	●		B	
Eisenhower	Denison	●	●		●	●	●	●		●		●	○	○	○	●		B	
Falcon	Falcon	●	●		●	●	●	●		●	●	●	○	○	○	●		B - T	Airstrip
Ft. Parker	Mexia	●	●	C			●	●		●	●	●	○	○	○	●		B	
Garner	Concan	●	●	S			●	●	●	●		●	○	○		●			
Goose Island	Rockport	●	X				●	●				●	○	○		●			
Huntsville	Huntsville	●	●	P	●	●	●	●		●	●	●	●	●		●		B-R-T	
Inks Lake	Burnet	●	●		●	●	●	●		●		●	○	○		●		G - B	
Kerrville	Kerrville	●	●	S	●	●	●	●		●		●	○	○		●			
Lake Brownwood	Brownwood	●	●	S			●	●	●	●		●	○	○		●			
Lake Corpus Christi	Mathis	●	●				●	●		●	●	●	○	○		●			
Lake Whitney	Whitney	●	●	S	●	●	●	●		●		●	○	○		●			Airstrip
Lockhart	Lockhart			H	●	●	●	●		●		●	●	●		●		G	
*Mackenzie	Lubbock	●					●	●		●	●	●	○	○		●		G	
Martin Dies, Jr.	Woodville	●	●		●	●	●	●		●		●	○	○	○	●		B	
Meridian	Meridian	●	●		●	●	●	●		●		●	○	○	Nature Trail	●		B	
Mother Neff	Moody	○					●	●		●		●	○	○		●			
Port Lavaca Causeway	Port Lavaca						●	●		●	●	●	○	○		●			
Possum Kingdom	Caddo	●			●	●	●	●	●	●	●	●	○	○		●		Texas Longhorn Herd	
Tyler	Tyler	●	●	S	●	●	●	●		●	●	●	○	○		●			
<b>Scenic Parks</b>																			
Bastrop	Bastrop	●		C	●	●	●	●	●	●			○	○				G - D	
Bentsen-Rio Grande Valley	Mission	●			●	●	●	●		●			○	○					
Brazos Island	Brownsville	○		Undeveloped Gulf Beach						○			○	○					
Caddo Lake	Karnack	●					●	●	●	●			○	○	○	●		D	
Davis Mountains	Ft. Davis	●			●	●	●	●		●	●	●	○	○		●			
Longhorn Cavern	Burnet		Daily Cavern Tours				●	●		●		●	○	○		Texas Longhorn Herd	●		
Monahans Sandhills	Monahans	○					●	●		●		●	○	○		●			
Palmetto	Luling	○					●	●		●		●	○	○		●			
Palo Duro Canyon	Canyon	●		Summer Drama "TEXAS"			●	●		●	●	●	○	○		Texas Longhorn Herd		R - D	
<b>Historic Parks</b>																			
Ft. Griffin	Albany	○		P			●	●		●			○	○		Texas Longhorn Herd		●	
Goliad	Goliad	○	●		●	●	●	●		●			○	○		●		●	
Gov. Hogg Shrine	Quitman	○					●	●		●			○	○		●		●	
Indianola	Port Lavaca	○	Open Bay Beach				●	●		●			○	○		●		●	
Jim Hogg	Rusk	○					●	●		●			○	○		●		●	
Lyndon B. Johnson	Stonewall	●		Texas Wildlife Exhibit			●	●		●			○	○		●		●	
Mission Tejas	Weches	●			●	●	●	●		●		●	○	○		●		●	
San Jacinto Battleground	Deer Park			*Battleship Texas			●	●		●		●	○	○		●		●	
Stephen F. Austin	San Felipe	●	●	S	●	●	●	●		●	●	●	○	○		●		G - T	●
Varner-Hogg Plantation	West Columbia			Guided Tours			●	●		●		●	○	○		●		●	
Washington-On-The-Brazos	Washington						●	●		●		●	○	○		●		●	
<b>Historic Sites</b>																			
Acton	Granbury			Burial site of Davy Crockett's wife															
*Alamo	San Antonio						●	●										●	●
Eisenhower Birthplace	Denison						●	●										●	●
Fannin Battleground	Fannin						●	●		●									
Ft. Lancaster	Ozona						●	●											●
Ft. Leaton	Presidio						●	●											●
Ft. McKavett	Ft. McKavett						●	●											●
Ft. Richardson	Jacksboro						●	●		●								●	●
Gen. Zaragoza Birthplace	Goliad			Monument Only															●
Monument Hill	La Grange						●	●		●									●
Old Ft. Parker	Groesbeck						●	●										●	●
Port Isabel Lighthouse	Port Isabel						●	●										●	●
San Jose Mission	San Antonio						●	●										●	●

\* Facilities Not Operated by Texas Parks and Wildlife Department  
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 ● Facilities or Services Provided for Activity  
 X - Open Shelters  
 S - Screened Group Hall  
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 P - Group Picnic Shelter  
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# WATERFOWL

## DO YOU KNOW

Art by

**CONSERVATION** efforts in waterfowl management depend greatly upon the hunter's ability to distinguish between various species of birds. According to this year's regulations, it is illegal to kill black-bellied or fulvous tree ducks, and restrictions in addition to the overall bag limits are placed

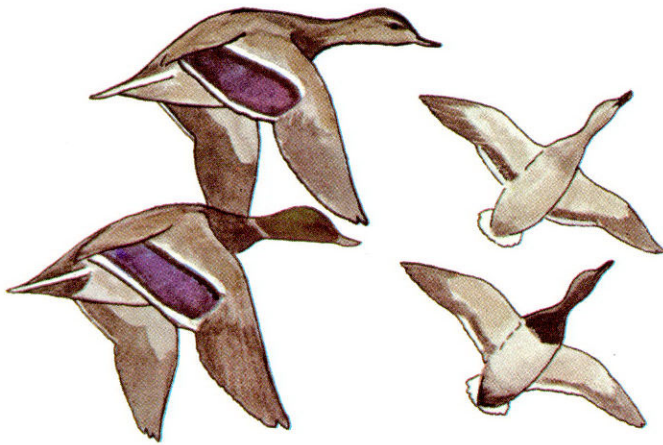
on certain species of ducks and geese.

Seasons and bag limits for this year are as follows:

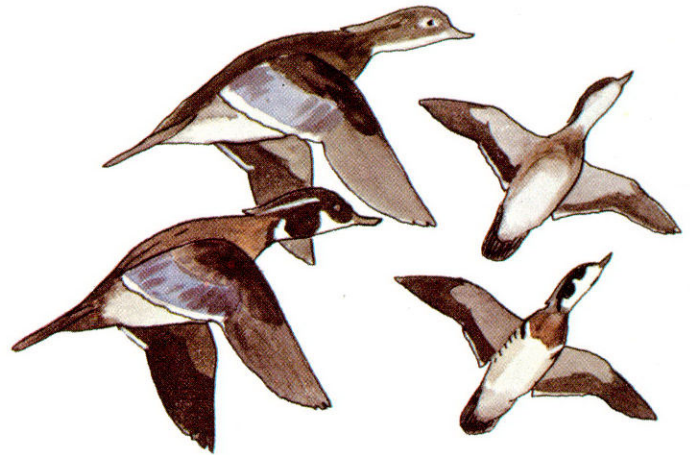
**DUCKS:** Open season is from November 18 through January 11 on all species except black-bellied and fulvous tree ducks (mergansers are considered separately). Daily

bag limit is four daily, not to include more than two wood ducks, one canvasback or redhead, and one mallard. Possession limit is eight, not to include more than four wood ducks, one canvasback or redhead, and two mallards.

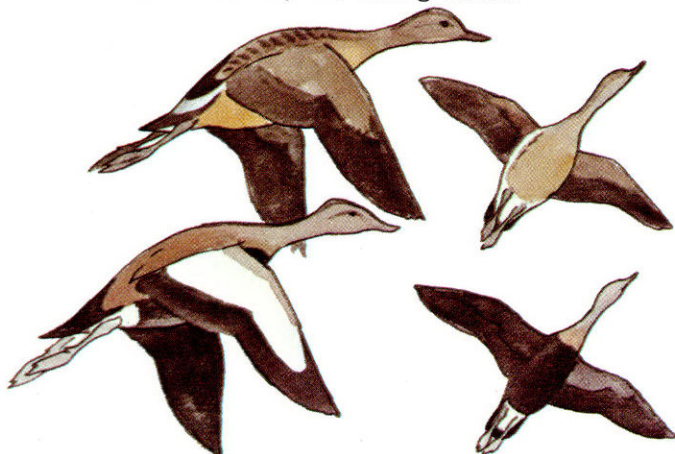
**MERGANSERS:** Open season is from November 18 through Janu-



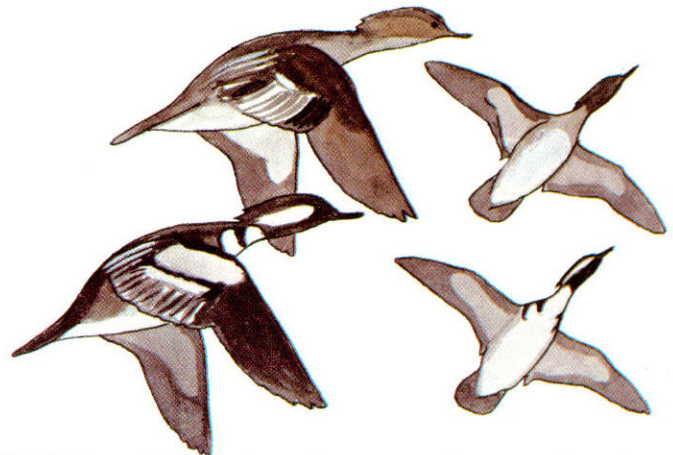
Mallards, hen above, are large ducks usually found feeding on rivers and ponds, but avoiding salt water. They prefer water with a maximum water depth of 12 to 16 inches since they are diving ducks.



Wood ducks, hen above, frequent forested areas with quiet fresh water. Flight is direct and fast; flocks are usually small. Wood ducks and mallards both rise straight up from the water without a run.



Fulvous tree duck, above, flies low, often at night, and is seldom seen. Black-bellied tree duck, below, is found along the coast in South Texas and has a shrill whistling call which it utters in flight.



Hooded mergansers, hen above, are often seen in pairs or very small groups. They will flush straight up or run along the water. Seldom going to salt water, they are found inland on almost any body of water.



# ON THE WING

## HOW THEM?

cGowan

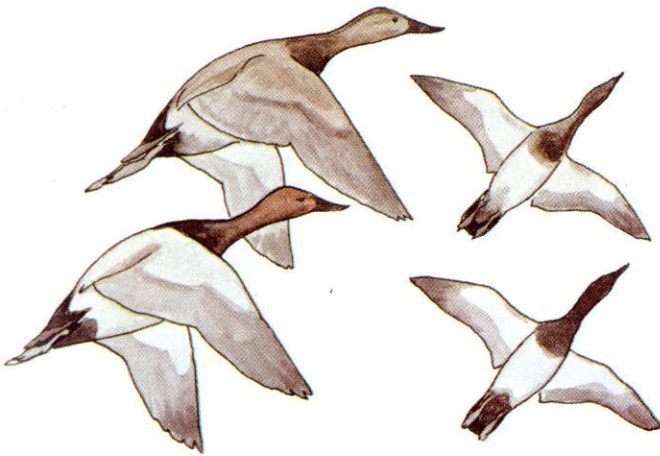
ary 11. Daily bag limit is five not to include more than one hooded merganser. Possession limit is 10, but not to include more than two hooded mergansers.

**GEESE:** Open season is from October 18 through January 11. The daily bag and possession limit is five with the following restric-

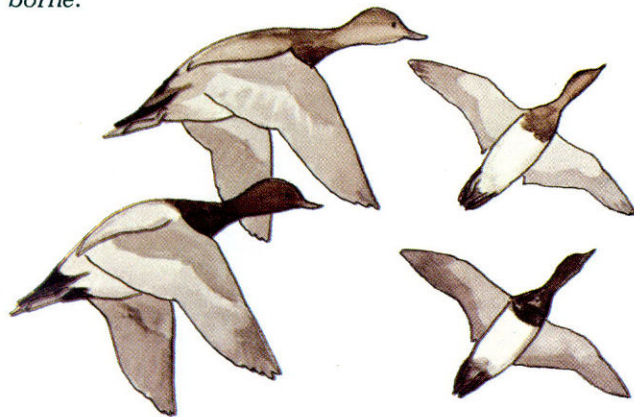
tions: West of U. S. Highway 81, the daily bag and possession limit is limited to one Ross's goose plus one whitefront, or two Canadas, or one whitefront and one Canada. East of U. S. 81, the daily bag cannot include more than one Ross's goose plus one Canada or whitefront; and the possession

limit shall not exceed one Ross's goose plus two Canadas or one white-fronted goose.

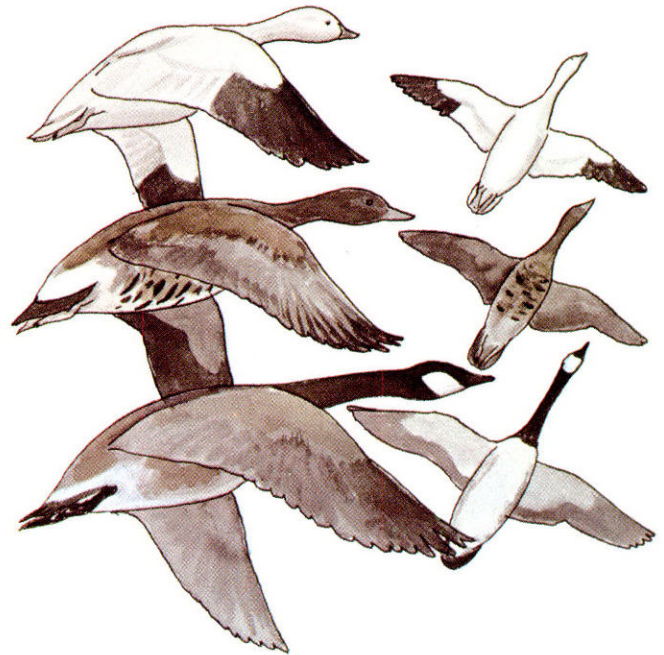
Shooting hours for ducks and geese start half an hour before sunrise and end at sundown. Identification is especially difficult in the twilight hours. See waterfowl regulations for further details. \*\*



Canvasbacks, hen above, are extremely powerful fliers. Compact flocks fly in indefinite formations with a very rapid and noisy wingbeat. Canvasbacks are diving ducks and run across the water before becoming airborne.



Redheads, hen above, are often found with canvasbacks. They migrate in large flocks in V-formation, but local flights are in irregular formations. Males make sounds like a cat's "meow," while the females quack.



Ross's goose, above, is a small goose (slightly larger than a mallard) often mistaken for a snow goose. It has a rather weak, gruntlike call, quite different from the snow's high-pitched falsetto honking. White-fronted goose, center, has uniformly brownish foreparts and darkly blotched breast. "Specklebellies" migrate in large, noisy, V-shaped flocks and gather in vast numbers at wintering grounds. Canada goose, below, is distinguished by conspicuous white sides of the head and a solid black neck. Calls vary from deep honking to high-pitched cackling.



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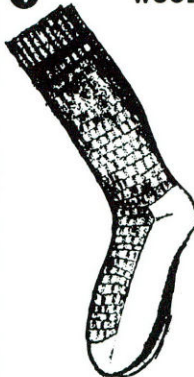
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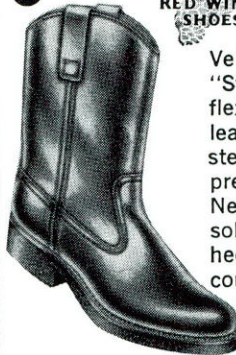


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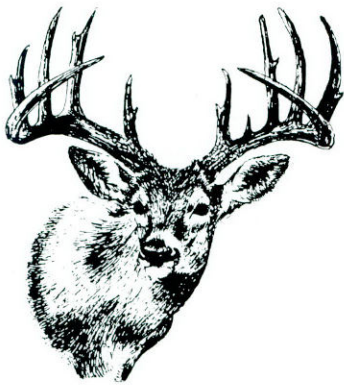


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that supplements natural diet. This is especially important during critical periods when natural food is limited in quantity and lacking in proper nutrition. For maximum results, and to hold coveys to a given habitat, feed GX-100 year 'round.

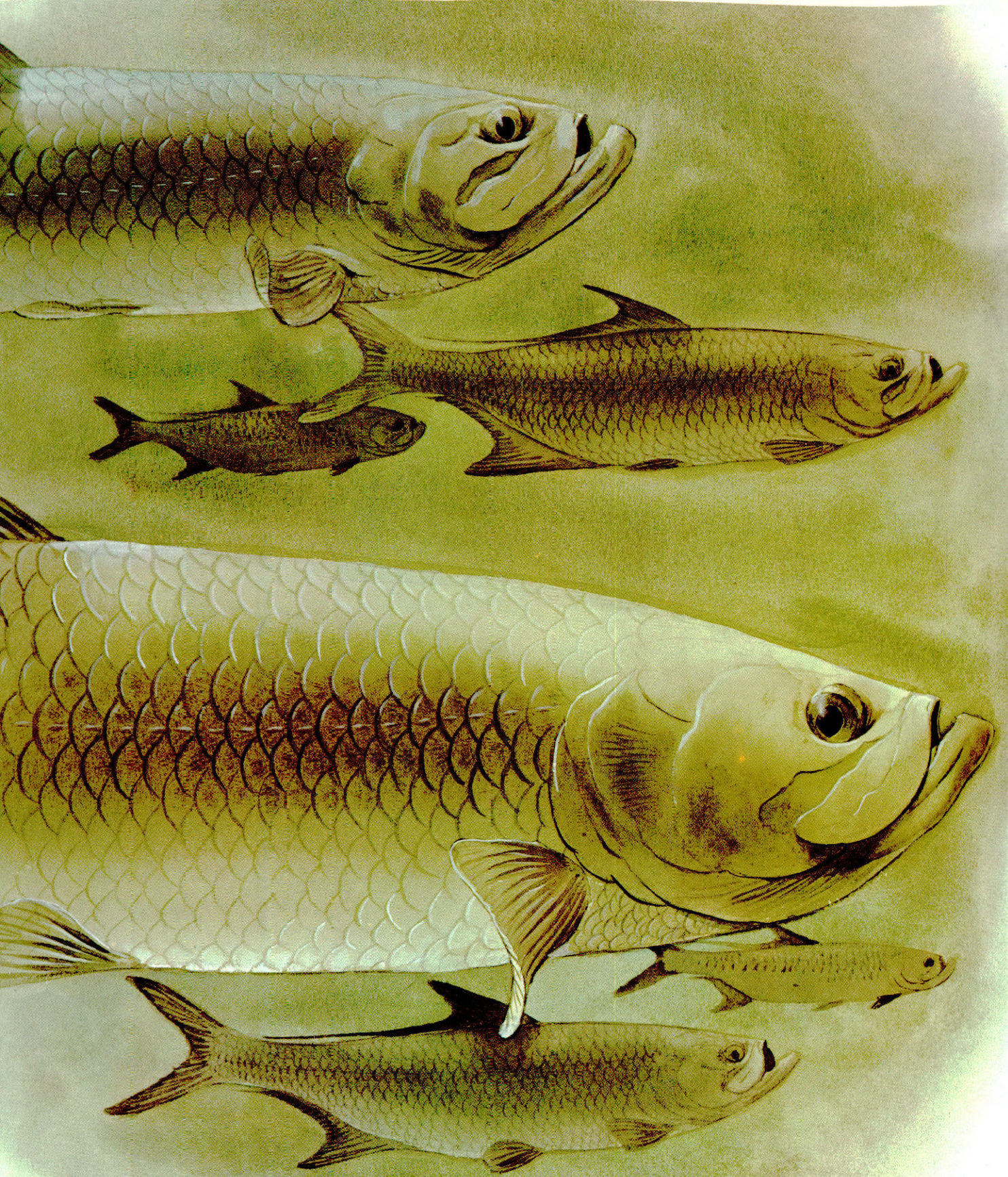
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McGowan



# Angler's Challenge

by A. W. Moffett Coastal Fisheries Biologist

**FAMED** for its fighting and leaping actions, the tarpon is one of the Gulf Coast's principal sport fish. It may live over 16 years, exceed a length of seven feet, and weigh over 250 pounds. Certainly, few other fish offer anglers a greater challenge.

These aquatic acrobats are capable of leaping 8 to 12 feet out of the water and 20 feet horizontally. A mighty sweep of the tail before leaving the water provides the power. The dorsal whip, a curious prolongation of the last dorsal fin ray, controls the direction of fall by lashing the dorsal to the right or left side.

Leaping tarpon are dangerous. In the late 1950's a huge tarpon landed in a charter boat fishing Boca Grande Pass in West Florida. Miraculously no one was injured, but the thrashing fish demolished fishing chairs, equipment, and part of the boat interior. Louis Babcock in his book, *The Tarpon*, writes that the fish "has been known to jump upon a man sitting in a chair on the deck of a steamboat." One knocked a guide out of a boat. "The man was stunned and drowned. In Galveston Bay, a tarpon leaped and broke a boatman's neck."

The name tarpon, of Indian ori-

gin, is most widely accepted. Like other popular fishes, however, tarpon have many common regional names: grande ecoy in East Texas, grande ecaille in Louisiana, Jewfish in Georgia, silver king in southwest Florida, and big scale in Massachusetts. Latin Americans call them sabalo, sadina, savalo, savalle, and savanilla.

Researchers have had difficulties working on tarpon because specimens are not readily available for study. Nevertheless, several investigations have been successful. Of these, the most significant work was done in Florida.

The tarpon is thought to have been around since the Cretaceous period—100 million years ago. Scientists account for the species long existence in its simple but well designed body. This points up the general principle that animals with simpler body adaptations are more likely to survive as a species.

Taxonomists place tarpon in the family Elopidae, along with bonefish, and in the genus *Megalops* (big eye). There are two species in the genus: *Megalops atlanticus*, the tarpon which lives in the Atlantic; and *M. cyprinoides*, the oxeve or oxeved herrung, a smaller fish that dwells in the Indian and

West Pacific oceans. The Atlantic form is the largest of the herring-like fish.

Scales, which cover the elongate and compressed body, are big, smooth, silvery, and cycloid. The belly is silvery. The back is dark and appears green underwater. Young may have a brownish cast to the back. Other features are the large mouth, big eyes, and deeply forked tail.

Tarpon are marine but tolerate a wide range of salinity and penetrate far up the rivers of Texas, Mexico, and Florida.

These primeval fish are native to temperate, tropical, and subtropical waters of the American and West African Atlantic coasts. On the American side, tarpon are common from Virginia to Brazil, and around Cuba, Bermuda, West Indies, and Bahamas. Strays have been caught in the North Atlantic off Cape Cod and Nova Scotia, and as far south as Argentina. Centers of abundance are the West Indies, Isle of Pines (Cuba), Florida, and the Gulf of Mexico.

When the Panama Canal was completed, tarpon appeared in the Pacific sea-level terminus and have been seen in the little Rio Grande which connects with the canal between locks at Miraflores



and Balboa. Perhaps they have penetrated the Pacific, but none have been caught there.

Texans catch tarpon between March and November, but mostly in June and October. Port Aransas, the Rio Grande, and the mouth of the Brazos River are favorite fishing spots. In Florida, the Keys and Boca Grande Pass are annual hot fishing grounds.

Usually tarpon over two feet long are fished in passes between islands, estuaries, inlets, and rivers. Anglers spot schools when they roll at the surface.

Although its gill surface is extensive, this strange fish breathes atmospheric oxygen. To do this, it has a specialized air bladder lined with vascular, lung-like tissue. Oxygen is taken during the tarpon's surface roll. If it cannot surface, even in well oxygenated water, it will suffocate in 7 to 128 hours. Thus, tarpon, both young and old, can live in oxygen-depleted water deadly to other fish. This, incidentally, makes them ex-

cellent pollution indicators since biologists can dismiss lack of oxygen as cause of death when testing the quality of water in which tarpon die.

Though they can live where other fish perish, tarpon cannot tolerate cold water. Consequently, extensive kills due to cold have been reported in the Rio Grande and many places in Florida. They live well in waters 64° to 105° F, and if the water cools slowly, they can survive in water 55° F.

Usually, tarpon spawn in shallow waters near shore when they are several years old. Females are about 4 feet long at first spawning, although a 2½-foot ripe female was once found in West Florida. A mature female may carry over 12 million eggs. To spawn, adults form small schools. After milling awhile, the water becomes clouded with a white, milky substance. This is milt emitted by males to fertilize eggs.

Larval tarpon in the early development stage, called leptoceph-

ali, have tiny heads and tiny fins. These transparent, ribbon-like larvae are occasionally found far out to sea, but those that develop into juveniles are probably spawned near shore and carried into sheltered areas by currents. One theory is that larvae migrate into coastal habitats along the sea floor.

Soon the leptocephalus shrinks and develops into a small tarpon, three-fourths of an inch long—an exact miniature of the adult form. Ten years ago the young were rarely found, probably because biologists did not know where to search. Since then juveniles have been found in salt marshes, brackish pools, streams, and other small bodies of water from Sapelo Island, Georgia, to the Sinu River estuary, Colombia. Usually these habitats connect with the sea, at least during high tide. Often the young appear in stagnant pools smelling of hydrogen sulfide gas and depleted of dissolved oxygen. Pelicans, herons, and other fish-eating birds have been seen feeding on baby tarpon while they are in the so-called nursery areas.

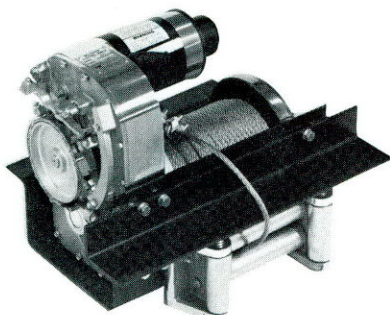
The juveniles, evidently, spend quite some time in the coastal habitats before returning to sea. But some never return. Instead they become landlocked in pools and lakes after abnormal high tides. The entire life cycle, including spawning, may be completed in such places. Deep Lake in Florida and lakes on the island of Andros in the Bahamas are examples.

Juveniles under three inches long eat minute copepods, larval crabs, and other plankton which they trap in their gill rakers attached to the gill arches. Their diet gradually changes to small fish and aquatic insects. Pinfish, mullet, catfish, shrimp, crabs, and other tarpon have been found in the stomachs of large specimens.

At one time, fishermen believed tarpon were nocturnal feeders, and fished for them at night. This was disproven when, due to war regulations prohibiting lights at

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night, daytime tarpon fishing became popular.

Experiments to study migrations, where previously tagged tarpon are returned when caught, have been unsuccessful. A popular theory, slightly supported by tagging data, is that adults move north in summer and south in winter along the Gulf Coast. Others believe that tarpon retire offshore in winter and move shoreward with the approach of spring. Unfortunately, this mystery, which puzzles scientists, remains to be solved.

Peoples of the West Indies, Central America, and Africa, where small markets exist, are fond of tarpon flesh. The oxeve of the Pacific and Indian oceans holds high commercial status as food fish, and research to rear larvae to market-size in marine ponds has been conducted.

In contrast, tarpon are not used as food fish in the United States. The scales, however, have some commercial value. Norman and Fraser in their *Field Book of Giant Fishes* write, "... it is said that these (the scales) can be sold at from 5 to 25 cents apiece. They are used for fancy work, being made up in various ways by the curiosity dealers to attract the fancy of the winter visitors to Florida."

Since tarpon fishing in the United States is virtually a sportsman's venture, it is customary to release the fish once the thrilling catch has been made (unless it's a trophy catch and the fisherman wishes to have it mounted). Thus, a released tarpon can provide thrills for future tarpon enthusiasts.

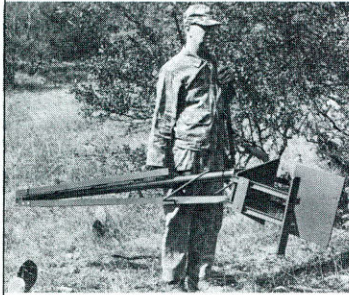
For real action, tarpon offers sport fishermen a big challenge. It is a fish that tries a man's wits as well as his strength. Many tarpon clubs hold annual fishing tournaments that attract sportsmen from all parts of the country, but only the most skilled will take trophies home. With its hearty gamefish qualities, tarpon is a valuable calling card for Texas' Gulf Coast. \*\*



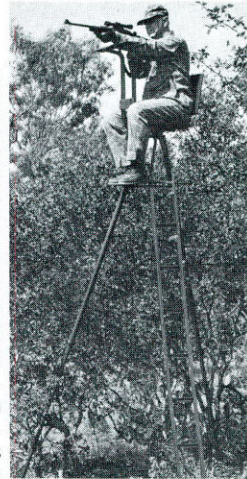
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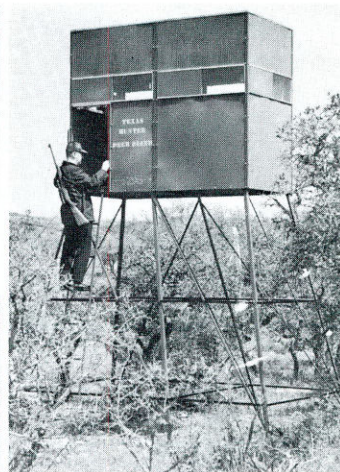
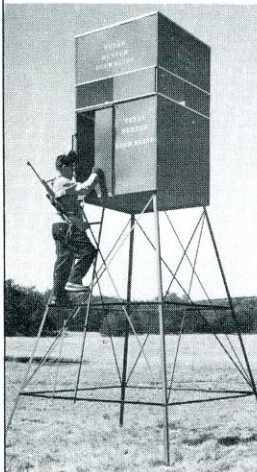
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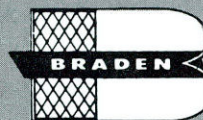


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# WHAT THE HUNTER SHOULD KNOW ABOUT...

## DEER PARASITES

by

Dr. R. M. Robinson and R. G. Marburger  
Texas A&M University Wildlife Biologist



**"BIG CRITTERS** have little critters upon their backs to bite 'em, and little ones have lesser ones, and so on ad infinitum" is a quote often heard. This is very true when we consider almost any type of game animals.

Domestic animals commonly eaten have many similar parasites, but these are removed in processing and are not seen when meat is bought over the counter at the local grocery store. Because the consumer is not used to seeing these uninvited guests, the hunter often loses his appetite when he finds them on his trophy animal.

It is hoped that by showing hunters some parasites commonly encountered in the field, they will be more knowledgeable about parasites and will not discard an otherwise palatable carcass.

Deer are attacked by parasites both from without and within, and in some cases may even be killed by parasitic attack. Parasites on the outside are easily observed as soon as the downed game is approached.

Ticks are the largest and most obvious external parasites one observes. In some areas these blood-suckers are found in great numbers and attack deer so persistently as to cause infected areas of the skin around the ears, "arm pits," and eyes. Most ticks are attached to these areas because it is more difficult for the animal to scratch there, or in the case of around the eye, it is too sensitive for them to scratch. Ticks come in many varieties, but all appear more or less alike. They are usually fastened to the skin and depending upon how long they have been attached, are filled with blood; sometimes to the point of gross distension.

Deer keds, also called crabs, ticks, or cooties, are really flies. They are very common on deer and are the most active of the external parasites. They crawl sideways and easily slip between the hairs. They hold on to hair very well and may be difficult to pick off. These insects suck blood, but they do not engorge to the point of distension as do true ticks. The particular kind found on deer prefer



Sertaria



Deer Keds

Louse



Deer parasites are usually removed in cleaning the animal and do not make the meat unfit to eat. Parasites do weaken deer and cause weight loss or even death.

deer, and are not usually found on other animals.

The louse, a sluggish fellow who hangs onto hair with hooklike claws, is small and is not commonly seen by hunters. This parasite can infest deer in fantastic numbers, and can remove enough blood to kill the animal. These diminutive vampires attach to the base of the hair, with their proboscis embedded in the host's hide. In heavy infestations they appear as a dark layer of greyish particles that look like dirt at the base of the hair.

Although these external parasites are not pretty, they are removed by skinning and therefore do not affect the edibility of an otherwise healthy animal. Heavy infestations, however, may result in an obvious emaciation and weakness of the host, and such animals should not be eaten—not because of parasites, but because of the animal's condition.

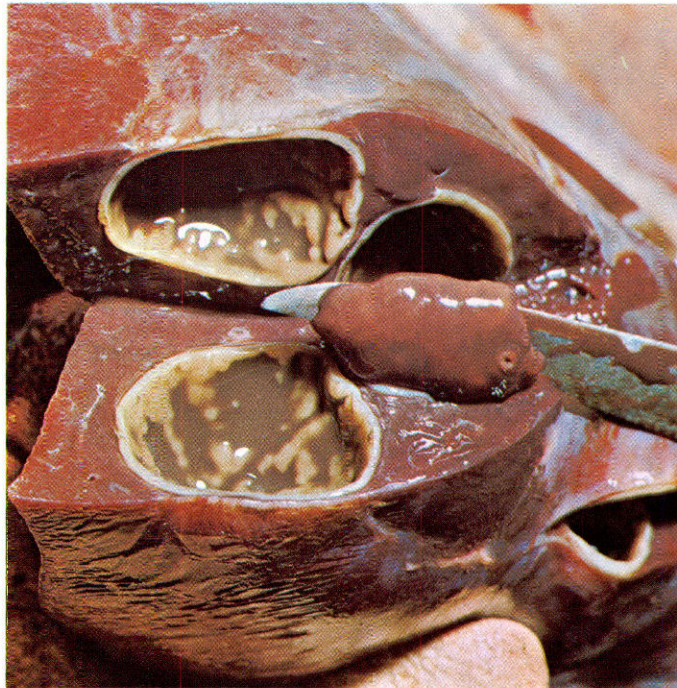
When the hunter begins to dress his animal he often encounters other types of parasites. In East Texas, hunters may find long, white worms about as big around as paper clips squirming around on the surface of the intestines. This worm, called *Setaria*, may be unwelcomed, but does little harm, to the game or to its palatability.

In West and Central parts of the State, bladder worms are commonly found. These larval forms of tapeworms are found most often attached near, or on, the liver, and are whitish bags of clear fluid with a whitish spot on one side. The mature forms of this worm live in coyotes and bobcats. These hosts expel the worm eggs which are then eaten by game animals and develop as bladder worms. The

Throat Bot







Giant liver flukes are often found in deer in river bottom of East Texas and wet coastal prairies. They are seen as lightly colored swellings or felt as soft spots in the liver. An infected liver is inedible.

cycle continues when the predator eats the deer's viscera and becomes infested with a new tapeworm. These bladderworms if still attached to the carcass following dressing, should be removed.

Hunters should pay special attention to the liver of white-tailed deer if they intend to eat it, particularly in the Eastern and Coastal regions. Deer that live in river bottoms and wet coastal prairies often have giant liver flukes. Looking like big worms, liver flukes produce a black pigment that stains the liver and sometimes even the surface of the intestines. They are first seen as lightly colored swellings on the liver, or may be felt as soft spots in the liver. When these areas are cut with a knife, dark, dirty fluid pours out and from one to three or four flukes may be found in the cavity. These livers, of course, should not be eaten.

There are a large number of parasites which inhabit the gastro-intestinal tract, but these are not seen unless the intestines or stomach are accidentally ruptured. If this occurs, parasites are the least of the hunter's worries, as a cleaning chore is now at hand that would make a strong man weak. Many gastro-intestinal parasites affect the health of the game species and may be found in large numbers in animals that are in poor condition. However, all of these are usually removed with the viscera.

After the carcass is field dressed, it is hung to cool. By the following morning one of the least appetizing of parasites may have made its appearance. This is the throat bot. It is the larva of a large fly

and hangs right at the back of a deer's throat while the deer is alive. As the carcass cools, these big "grubs" release their hold and fall out. These parasites must irritate the animals to a considerable extent, and deer with throat bots may sneeze quite often. Adult deer are afraid of the parent flies, and will strike at them with their forefeet, run away, or hide their nose in grass or rodent holes in an effort to prevent the flies from laying eggs in their nostrils. Like most of the other parasites, throat bots are harmless except that they weaken the deer.

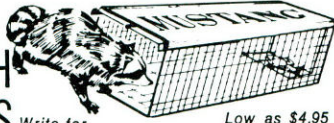
Most parasites of deer are not infective for man, but there is one that we should not forget although we do not see it. This is the trichina worm, which will infect people and produce disease. The larvae of this worm encyst in muscle, and when undercooked meat is eaten, will infect man. This parasite has not been found in Texas game so far.

Texas' deer are ordinarily quite free of parasites during hunting season, but when a herd becomes overpopulated, the parasite problem increases. This only stands to reason as the chances for these organisms to pass from one animal to another are increased in proportion to animal density. A built-in advantage to proper game management is the fact that heavy harvest of overpopulated herds will tend to help control parasitic infestations.

Hunters and landowners should utilize their doe permits to obtain a proper harvest. The fact that they are issued at all means a general area is improperly harvested. \* \*



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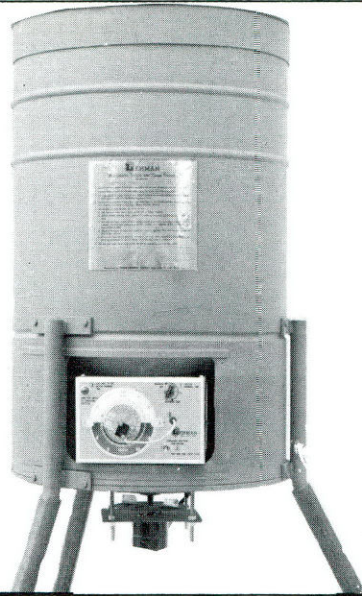
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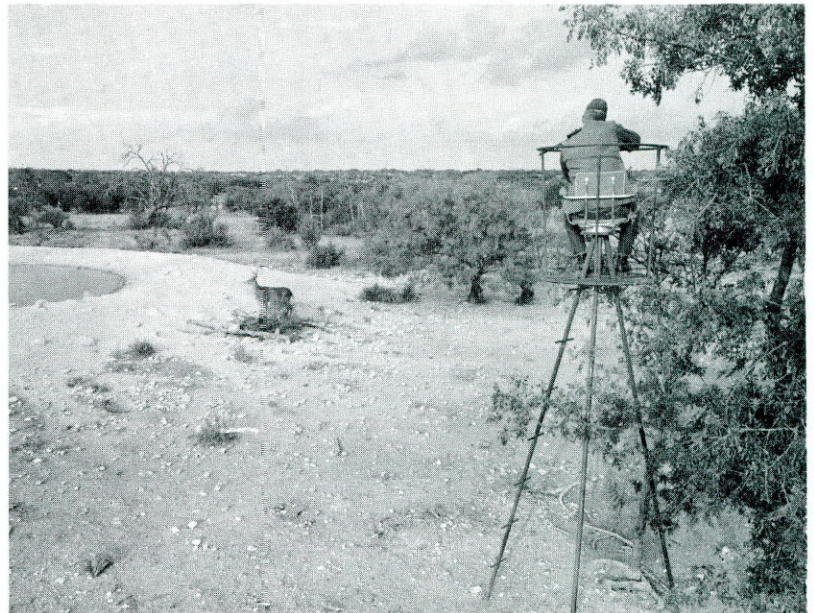
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# Junior Sportsmen

by Suzanne Winckler

**HAIR**, horns, hooves, feathers, skin, claws, beaks, and nails are accessories that make an animal's world safer and more comfortable. Of course, all these "accessories" come in many shapes, textures, and colors and each has a special use. A cat's whisker doesn't look anything like a duck's bill nor does a feather remind you of a fingernail. But all these animal specialties are made of the same horny substance called **keratin**. All are formed in the outer layer of skin, the **epidermis**.

How can a substance take so many forms? This has puzzled scientists for many years. Keratin is thought to have developed millions of years ago as life forms emerged from water to land. Keratin is tough, fibrous, and insoluble in water. It provides perfect "armor" to prevent loss of body fluids and performs a variety of jobs.

Human skin contains keratin. Covering our epidermis is the **corneum**, which is really a very thin sheet of horn and constantly sheds invisible scales. If skin is chapped or dry, you can see these tiny scales as they flake off. Have you ever had **calluses** on your hands or a **corn** on your toe? Calluses and corns are lumps of corneum that form when extra pressure is applied to skin.

All mammals have hair—sparse on some but thick on others. Whale's hair consists of thick bristles around the mouth. In fact, whale hair is about as large as hair gets. A single bristle may

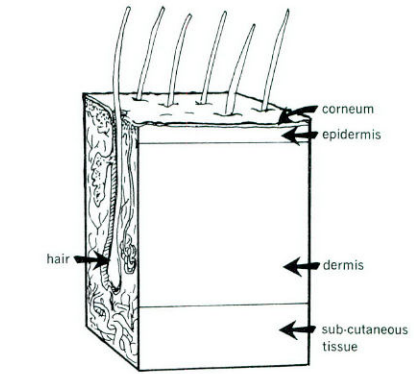
be one-fourth of an inch in diameter. What is the finest hair? Wool. Some single strands measure one two-thousandth of an inch in diameter.

What is hair good for? It is excellent insulation and protection. Surely you have noticed a lion's mane. This thick collar of fur protects a weak spot—his neck. Without this ruff, only a thin layer of skin would protect his vital windpipe, throat, and veins.

Caribou and pronghorn hides offer superb insulation. The fur is thick and coarse. It is also hollow. A great deal of air collects in and around the hairs and acts as a "buffer zone" against heat or cold. Eskimos are especially fond of caribou furs. They use the hides as ground covers under sleeping bags and even as standby life preservers. A caribou fur is buoyant enough to support a man like a raft.

Human hair does us limited service. To some extent, it protects the brain by keeping our heads and ears warm in winter and cool in the summer's heat. It may also cushion bumps if it is thick and bushy enough. Many a bald man notices that he receives more minor head injuries—bumps, scrapes, and scratches—on his hairless head than when he had hair. But human hair is mainly an adornment. It doesn't begin to insulate and protect us as other animal furs do.

Perhaps the strangest growth of hair is found on the rhinoceros.



A cross section of human skin

The horn growing on his snout is really a tightly woven mass of hairy keratin fibers. The next time you visit a zoo, take a good look at the rhinoceros' horn of hair.

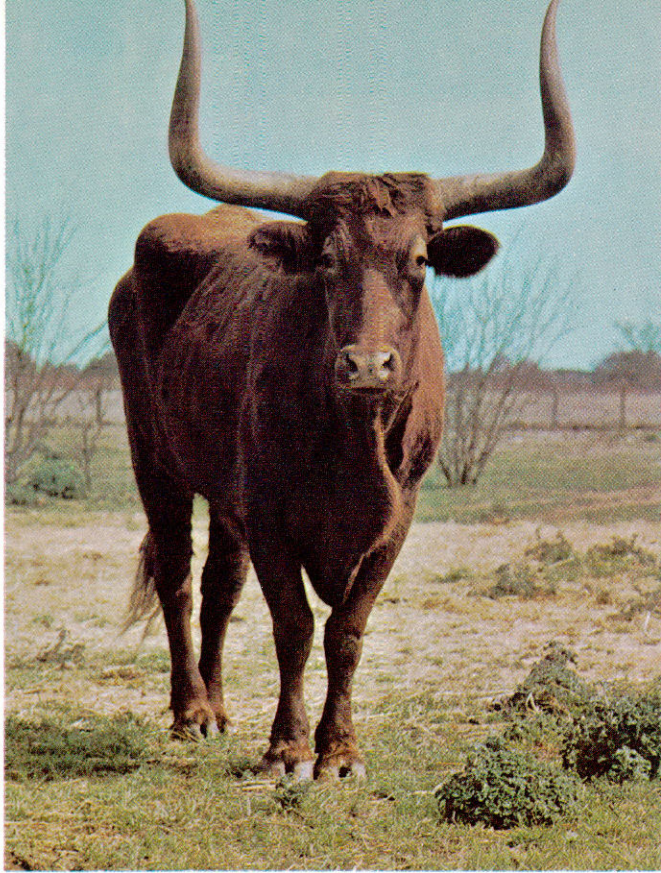
What is a true horn? Cattle, sheep, goats, oxen, and African antelope, all members of the Bovidae family, have true horns. They consist of a core of bone covered by a hollow cone of keratin. *True horns do not branch and are never shed.* This should help you remember the difference between horns and antlers.

Members of the deer family, Cervidae, bear antlers. Antlers are sometimes called horns but they are different in several ways. They are not hollow like true horns but rather solid and bony. They form branches which often are quite large and majestic.

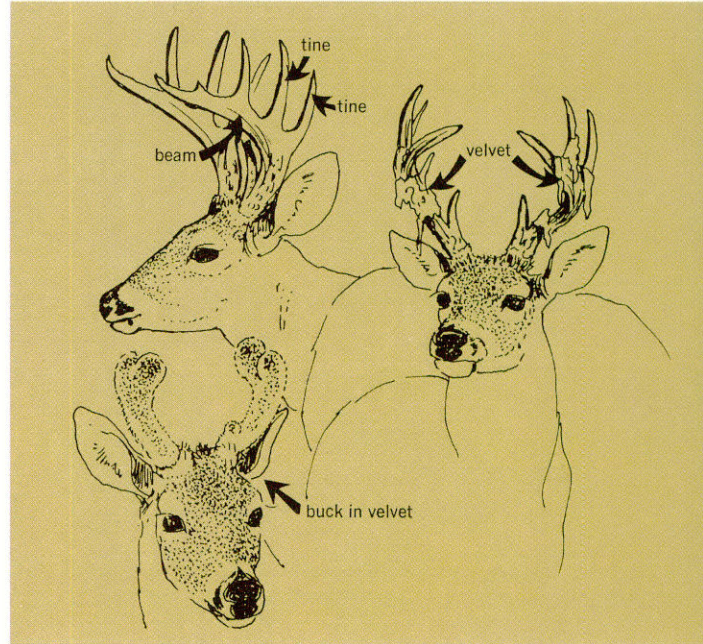
During the five to six-month period when antlers are growing, they are said to be **in velvet**. This refers to the mossy skin attached to them. When full grown, antlers contain no horny substance and are very hard due to deposits of calcium salts (lime). Deer receive calcium from the plants they eat.

Normally a deer sheds his rack and grows a new one each year. In most instances, a buck will grow only a spike in the first year; but in later years, if range conditions are consistently good, his **beam** (main limb of antler) will increase in size and it may have several **tines** or points. However, after a buck reaches old age





Bill Duncan



*True horns do not branch and are never shed. This is the difference between horns and antlers.*

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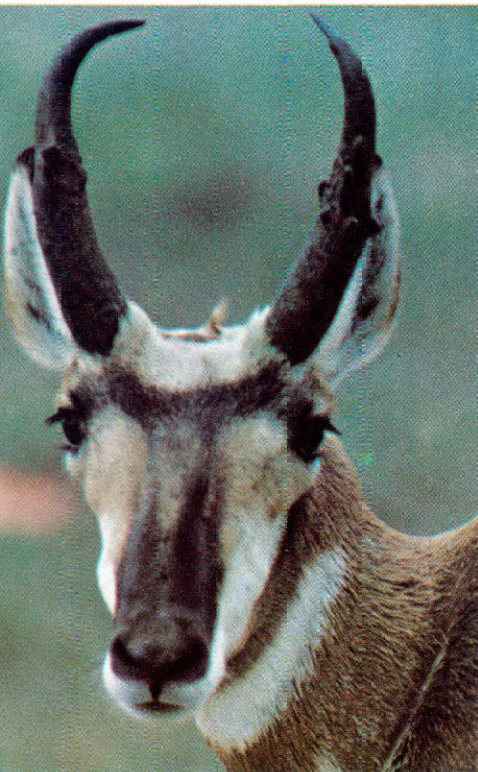


—his antlers start decreasing in size getting smaller and smaller each year.

Pronghorns are unique horned animals found in Texas. They belong to a family of their own. Pronghorns are named for their horns which do indeed have a prong on each beam. Like the Bovidae family, pronghorns have a bony core. However, pronghorns shed the outer layer of their horns each year. Pronghorns are kind of in-between animals.

Now, let's move from head to foot. Do you know what an **ungulate** is? An ungulate is a hoofed animal—horse, cow, deer, hippopotamus are a few. Can you think of any others? Scientists think that many millions of years ago this group of animals had toes. As time passed, however, some four-footed creatures began walking on tip-toes picking up their heels as they went. Thus, they were able to go faster. Swift ness no doubt was a means of protection from enemies. Since the side toes were little used, they became quite useless. But weight and stress were most severe on the middle toes—a horny hoof devel-





Leroy Williamson

oped somewhat like a super-callus.

Of course, hooves are shaped differently for different tasks. Have you ever watched mountain goats and sheep, and wondered how they could walk on steep cliffs? They are so agile because their hooves are cupped with sharp edges that grip footholds on the rocky terrain.

The wonders of keratin, as you can see, are everywhere around us. It is pleasant to think that the same substance which forms our hair, skin, and fingernails also shapes accessories that keep the mountain goat on his lofty cliffs, provides a cat with whiskers sensitive to touch, lets the horse run with speed, and gives the owl claws to grasp its food. \*\*

### Books to tell you more about hair, horns, hooves, feathers, skin, claws, and nails:

*Animal Clothing* by George F. Mason; William Morrow and Co., New York, N. Y., 1955.

*Horns, Hoofs, Nails* by Marguerite Rush Lerner; Lerner Publications Co., Minneapolis, Minn., 1966.

# Tutor Topics



### Where do names come from?

*Cornu* is the Latin word for horn. This helps explain words like corn, cornucopia (horn of plenty), cornium, and unicorn (the mythical horse with a horn in the middle of its forehead).

*Keras* is the Greek word for horn. Thus, we have the word keratin.

Antlers are derived from a Latin word, *antocularis*. Ante means in front of and oculus pertains to the eye. So antler refers to the positioning in front of the animal's eye.

### Match the word with the proper definition:

1. keratin
  2. epidermis
  3. corneum
  4. calluses and corns
  5. in velvet
  6. tines
  7. beam
  8. ungulates
- 
- a. main limb of an antler
  - b. hoofed animals
  - c. period when antlers are growing
  - d. thickened lumps of corneum
  - e. smaller branches growing off main limb of an antler
  - f. top layer of skin which is a layer of horn
  - g. horny substance found in horns, hair, hooves, feathers, skin, claws, beaks, and nails
  - h. outer layer of skin where keratin is formed

(See page 10 for answers)



# Letters to the Editor

## Grackle Problem

In the article "Whitewings vs. Grackles" in the July 1969 issue, reference is made to a chemical (DRC-1339) which has been found to be of value in the control of the boat-tailed grackle.

We have had several bird baths in operation in our trailer park for the past 15 years and the park has become something of a refuge for doves, mockingbirds, wild canaries, and other birds. However, we are subjected to occasional ravages of invading grackles. If this chemical DRC-1339 is available in small quantities commercially, we would like to try using it in our park.

H. E. Yeager  
San Antonio

The selective grackle control technique using DRC-1339 is primarily based upon two points; (1) the relatively high degree of toxicity the compound has for grackles as compared to other avian species, and (2) the design of the pans used to present the toxic solution. As pointed out in the article, the technique is still in the development phase, consequently, the use of DRC-1339 is not authorized for use by the general public.

Again, as stated in the article, the grackle is protected by federal law.

## Deer Populations

Could you tell me the total deer population of the United States, which state has the largest deer population, and the number of deer per square mile in that state? Also, which Texas county has the most deer? We think Llano County will probably rank highest, but we are not sure.

Mrs. E. D. Sumrall  
Votaw

Latest estimates indicate there are approximately 11,639,000 deer in the United States. Texas supports approximately 3,300,000 of these deer or 28 percent of the United States' total population. This number of deer scattered over Texas' 267,399 square miles would average 12.3 per square mile. The only other state that even comes close to the Texas deer population is Michigan with 650,000. That State covers 58,216 square miles, which indicates an average of 11.1 deer per square mile. The counties in Texas having the most deer accord-

ing to recent estimates are Kerr, 138,000; Edwards, 121,000; Sutton, 117,000; Val Verde, 105,000; Gillespie, 101,000 and Crockett, 101,000. The estimate for Llano County was 75,000 deer.

## BACK COVERS

**Outside:** Proper range management will serve to increase turkey numbers. See related story on page 7. Photo by Leroy Williamson.

**Inside:** A lone Mexican green violet-ear hummingbird made his glittering appearance in the Edwards Plateau in late August—approximately 1,000 miles north of his natural habitat in the high mountains of southern Mexico and Guatemala.

*Colibri thalassinus thalassinus*, as he is scientifically called, secludes himself in brushy pine forests at altitudes of six to eight thousand feet in his native habitat. The altitude of Travis County—the displaced bird's territory since first sighted—ranges from 400 to 1,400 feet. He was first seen in a Chinese Tallow-tree which does not grow in the higher elevations of this bird's normal range.

Exhibiting his shade-loving tendencies, the Mexican green violet-ear remained in the shadowy cedar brakes on a heavily wooded slope of Barton Creek Canyon near Austin. He frequented the hummingbird feeders in the Ken Copeland yard on the brink of this canyon.

The Mexican green violet-ear's general coloration is green and he is about twice the size of a ruby-throated hummingbird. His distinctive markings are an iridescent streak of blue-violet below and in back of the eyes, a bright metallic green chin, a spot of blue feathers on the chest, and a mild curvature of his dull, black bill. Photo by John Suhrstedt.

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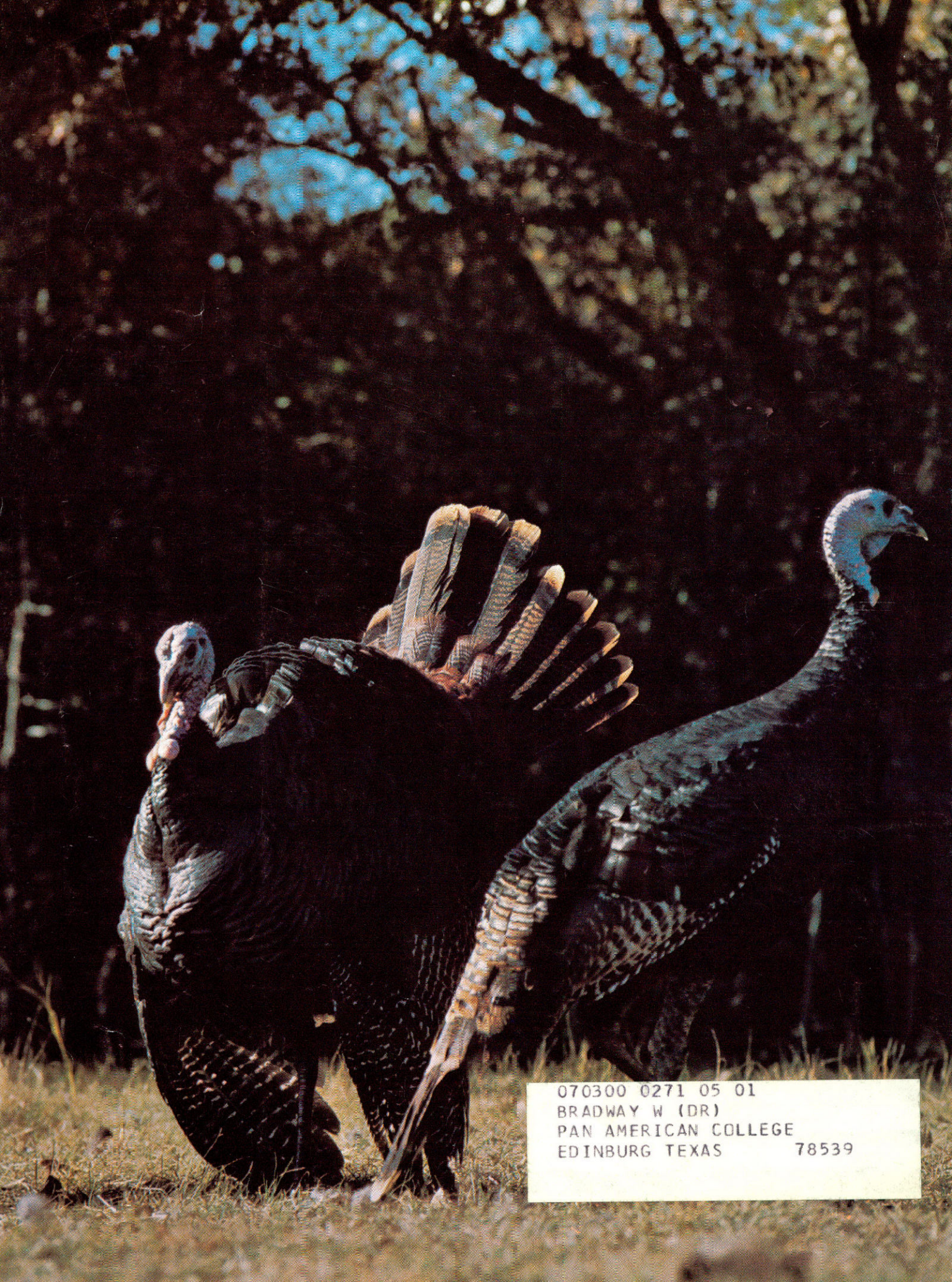
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