

# Texas Game and Fish

JANUARY

1955

TEN CENTS







Believe it or not, neither Orville O. Rice, who painted the front cover, nor Clyde Graham, who took this photo, had seen each other's work until these two images of a Texas 'possum and her young were brought together for this issue. The young of the opossum, one of Texas' better known mammals, remain in the mother's pouch nearly two months, then travel with her as above before leaving for lives of their own. More photos on inside back cover.



# Texas Game and Fish



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A MONTHLY MAGAZINE DEVOTED TO THE PROTECTION AND CONSERVATION OF OUR NATIVE GAME AND FISH; AND TO THE IMPROVEMENT OF HUNTING AND FISHING IN TEXAS.

January, 1955

Vol. XIII, No. 1



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This Month's Original Cover Painting

By Orville O. Rice





**Long Shot**

Editor:

Last December 26, Walter Weaver and my son, Jay H. Huser, and I had permission to hunt on the Casa Blanca Ranch in Northwest Hidalgo County, about 45 miles from my home at Donna.

To make a long story short, I got a seven-point buck at about 90 yards around 9:30 a.m. I found my son, Jay, and we went in the car to pick up my buck, then started back through the ranch.

About noon, Jay stopped the car in a spot where we could see much of the surrounding country. We built a fire, and were eating lunch. Then Jay spotted a buck.

We decided both of us would shoot when I counted to three. Jay didn't get his shot off, but we could tell mine hit. It was a long shot, and I aimed about 12 inches above the withers. I was

shooting a 30-06 model 70 Winchester with an Alaskan post scope.

We drove the car to where the deer was. He got up, and Jay fired and broke his neck.

The buck was a beauty, a 12-pointer with 22-inch spread and weighing 140 pounds.

We drove back to the spot from which I had fired, measuring the distance on the car speedometer. It was exactly three-tenths of a mile—528 yards. The deer had gone about 100 yards from where I hit him.

H. C. Huser  
Box 674  
Donna, Texas

**Camp Site**

Editor:

Some writer in your magazine is always trying to tell us where and how to catch a fish, track down a buck or slip up on a gobbler. I have a problem that I think might be real food for thought.

If a hunter, camped in northern Kerr County the opening day of the deer season, started out from camp at sunup and accurately followed his shadow all day at a steady pace, would he be back at camp by sundown?

The answer is "No, because he didn't go the proper distance in the right direction." Confidentially, I figure he would travel in a semi-circle, and would be due north of camp a distance of his time out by his speed, multiplied by two and divided by pi, with a correction according to his exact latitude and the angle of the sun's rays.

This correction I am unable to make, being an ordinary old cowpuncher. But I am sure you or someone on your staff can figure the exact location, including the shape of the curve.

A. D. Thompson  
201 East Rogers Street  
Arlington, Texas

(I agree with you that the hunter would wind up due north of his camp—how far I wouldn't hazard to guess. Nor would I know whether he would travel in a semi-circle, ellipse, or parabola. Maybe some of our mathematically-minded readers can figure it out.)

**Blue Crab**

Editor:

I am enclosing a picture of Miss Alice Hodon, Taylor Press employe, holding a salt-water crab caught by Richard Falk and Willie Lange in Lake Travis October 24.

The crab was taken in eight feet of



water, while the men were fishing with shrimp. Its body measured 9 inches by 4 inches by 1½ inches, and claw-tip-to-claw-tip measurement was 21 inches. The top coloring was greenish-brown, and the underside and claws were blue, brown and orange.

I am wondering if this crab is a rarity for Lake Travis since old-timers in the vicinity can't recall having heard of one being caught before.

Bill Kenneby  
Outdoor Editor  
Taylor Daily Press  
Taylor, Texas

(Marion Toole, head of our Inland Fisheries Division, tells me he has not heard of a blue crab coming from Lake Travis, Lake Austin, or the Colorado River in that vicinity.

(However, it is well known that blue crabs do very well in fresh water. In fact, they are inclined to grow larger than they do in salt water. They have never been found to reproduce in fresh water.

(Chances are, this particular crab has been placed in Lake Travis by someone recently; or there is a possi-

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bility it may have come up the Colorado and crawled around the dam since crabs are known to migrate overland.)

### Fluke or Flounder?

Editor:

The excellent portrayal of a flounder on the cover of the July issue of TEXAS GAME AND FISH was said to be a fluke by one of my Eastern fishing friends. For years, I gigger flounders in waters along the Gulf coast and never heard them referred to by any other name. Are the names used interchangeably, or is there a scientific distinction between fluke and flounder?

W. E. Caldwell  
4 Irving Place  
New York 3, N. Y.

(Your Eastern friend is right about the flounder on the cover of the recent issue; it is *Paralichthys lethostigma*, locally called "southern flounder," but called "southern fluke" in many other regions.)

(All flukes are flounders, but not all flounders are flukes. Flounders constitute the larger group, the family Pleuronectidae. The flukes are in the subfamily Hippoglossinae. The fluke, then, is a type of flounder.—Patricia Pew, Marine Fisheries Division.)

### Rattler Challenge

Editor:

I noticed the first two letters to your magazine this month and read them with much interest, since I have hunted snakes for 10 years. I think that H. Wayne Ferrell is in for a disappointment when he measures his rattlesnakes well over six feet long. It is easily possible to stretch a dead rattler three or four inches.

I have had the pleasure of hunting snakes with the late Ed Johnson of Waco for the past few years. Ed hunted for 40 years before his untimely death from the bite of a 4½-foot rattler in March of this year. Ed, who was one of the nation's leading experts, once made the same offer that W. G. McMillan made in the July issue of the magazine. But the boys who made the wager with him backed out when they tried to catch a four-footer.

As to the second letter in the same issue, Mr. George should carefully examine either a picture or an actual specimen of the Cuban boa, a large constrictor of the islands of Cuba and Puerto Rico. This snake is non-poisonous, and at one time was fairly common on these two islands. When an amateur starts to identify any snake over six feet long as a rattler, he had

better make sure the rattles are still attached. Granted that the record length of the Eastern diamond-back is eight feet, nine inches, any of the rattlesnakes inhabiting South America or Mexico are of much smaller size.

Wayne Tasker  
211 Hopkins Street  
Longview, Texas

(At last report, no one had met McMillan's challenge to produce a rattler six feet or over caught in Texas. Incidentally, the late Ed Johnson was featured in an article, "Wooing Death at Night," in the December, 1952, issue of TEXAS GAME AND FISH.)

### Spike Buck

Editor:

I have been hunting deer in Texas for 16 years, and every year I see several "spike buck" deer dead in the woods. As you know, they were killed by hunters thinking they would have a third prong and, finding they didn't, leaving them lie for fear of being prosecuted.

I am sure every deer hunter feels as I do. Spike buck deer should be considered as legal buck. Please question the hunters as to their opinion in this matter.

Jack Garland  
1212 Northeast 36th Street  
Oklahoma City 5, Oklahoma

(There is much room for thought regarding this question, and you may rest assured that the folks here at the Commission have considered such a proposal. However, as you have indicated, the hunters in the long run have much to do with such laws since it is their representatives in the State legislature who make the game laws.)

### Teaching Aid

Editor:

I enjoy your magazine very much and use it more than any other magazine as a help in my science classes. I use your cover each month for science and bulletin board lessons.

Mrs. Horace L. Jones  
May, Texas

### Deer Head

Editor:

I am attaching snapshot of a deer head found in Montana by Noah Ball on his place on the Boulder River. The 20-point buck weighed approximately 300 pounds. While he was rubbing his horns on the ground, a large flint rock weighing about 10 pounds became wedged between two of the points. The weight of the rock at the end of his



horns exhausted the buck, and he lay down and starved. This is just another method nature uses to balance the herd, but it is the first time I have heard of a deer dying from this cause.

Theo C. Telotte  
P. O. Box 2316  
San Antonio, Texas

### More About Pete

Editor:

I apologize for not having answered your letter of June 29 earlier. Yes, the Joe W. Caldwell on my letterhead is the one who raised "Pete" the quail. Joe W. is my son, and the truth of the matter is, I had two tiny quail dumped on me. I kept them for several weeks, when one was accidentally killed. The other, which I gave to Joe W., became the famous Pete.

Pete is still alive, lives in my son's home as one of the family, lays about four dozen eggs a year, and sings the most unusual song of greeting to strangers you ever heard. She covers most of the scale with her chirping or singing. Makes more different noises than I ever thought a quail could make. She still likes her morning coffee and, if allowed out of her cage at mealtime, will jump up on the table and pilfer food from everybody's plates. She is about the most cunning pet you ever saw.

J. B. Caldwell  
795 Third Street, Northwest  
Paris, Texas

(Many thanks for your letter regarding your son and Pete, the quail. I know our readers will be glad to get this further information about Pete, who appeared on the inside front cover of our December, 1952, issue.)



# QUAIL MANAGEMENT ON PASTURES

By DANIEL W. LAY  
Wildlife Biologist\*

In Texas a change has come to some of the land.

Here are ways bobwhite quail can be helped in their fight to adjust to these changes.

The best explanation I can find for the general decline of bobwhite quail in the South in recent years is the widespread increase in livestock farming. Typical counties in eastern Texas now have 90 percent of their agricultural lands in pasture, where 15 years ago, most of the land was in corn, cotton, peas, and other row crops, or in fallow. This crop farming was ideal for quail.

Maximum numbers of quail and maximum numbers of livestock are incompatible; but the problem is to salvage part of the native quail habitat in pastures and to design improvements that will appeal to the livestock farmer. There is no other alternative if you look at the quail problem from a region-wide viewpoint.

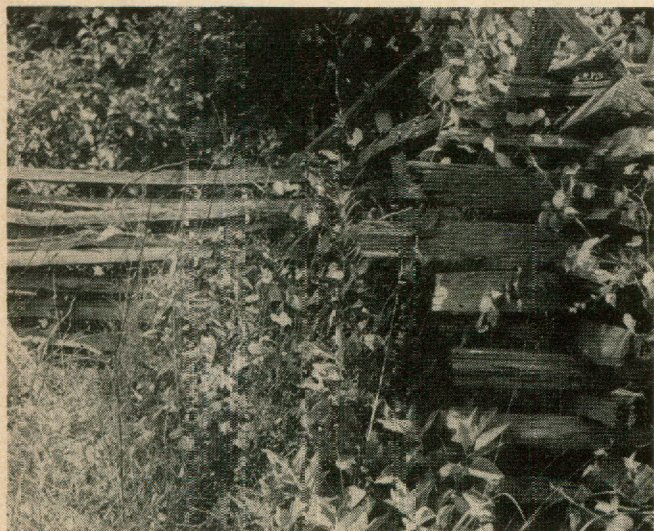
Private quail preserves, such as those in the southeast, with their intensive management and high quail populations, are fine for those who can afford them; but their contribution to the total bag is negligible. The bulk of the quail will continue to come as by-products of lands used for cash crops.

The basic concept that quail populations are controlled by food and cover can't be repeated too often. It

*\*P-R Project W-51-D.*

## Quail once used this . . .

Bobwhite quail reached all-time population peaks in East Texas during the past days of small farms. Rail fences and off-season corn fields provided perfect shelter and spots where natural foods could grow.





may be "old stuff" to some, but there are many who have not fully accepted it. Troubles develop when it is ignored. And there is no satisfactory way to increase quail except through habitat improvement.

Much is yet to be learned about quail population dynamics. We don't know how to interpret fully sex and age ratio data. We can't explain why the stockman can produce 400 pounds of beef per acre, but can produce no more than a few ounces of quail. Such problems are intriguing, but they must not detract from our efforts to improve habitat. It appears most likely that additional knowledge will supplement rather than displace the basic habitat concept.

Responsibility for improving habitat needs to be defined. The quail belong to the public, and public agencies regulate their harvest. Taxes on hunters also provide funds for research and management. But it does not follow that the quail crop depends entirely on the State. Little, if any, credit is offered the State when hunting is good. Yet when hunting is bad, there is a tendency to blame the State and demand more action.

Since the bird crop depends on the productive capacity of the land, most of which is in private hands, the landowner is more directly responsible. The State's power to produce quail is limited to advice, encouragement, and perhaps some materials, voluntarily accepted by landowners.

For the individual hunter, the implication is clear. He should place part of his demand for action with the landowner. He should find himself a place to hunt and do whatever is necessary to get the landowner to maintain or improve the crop.

The task of public game managers is to advise what can be done in such difficult but common places as cow pastures.



To replace natural quail shelter on pasture lands, mul-flora rose can be planted. It forms a useful living fence within a few years. Bicolor lespedeza for food often is planted alongside.

Whatever is done for quail must not interfere with the cattle or pine trees if the landowner is trying to make money out of them. However, since excessive grazing pressure is incompatible with quail, arguments in favor of moderate grazing pressure are needed.

Some points that might influence him to cull his herd are the remaining cows will be in better condition; require less feeding and general overhead; produce more and heavier calves; do less damage to young pines; prevent deterioration of climax range grasses, and make way for more quail. With moderate grazing, the landowner can develop quail densities up to a bird per five acres with little cost.

The question of what to advise for quail on moderately stocked pastures depends on local land use, soil types, cover pattern and similar factors.

● Continued on page 26

## Today they can use this . . .

Today much of the old farmlands are in pasture for grazing, and quail are hard pressed to survive. However, with a little help from man, natural foods like croton, left, and partridge peas, right spring up voluntarily.





A survey of who  
hunting in this st



Overpopulation and death from malnourishment is a big problem in some areas, particularly in the "Hill Country." The harvest of excess does and research leading to improved range management are helping bring about better habitat conditions. This malnourished buck died during one of the frequent annual "dieoffs," which often claim thousands of deer.

This article is the first in a series of two on the subject of deer management which constituted the major portion of an address by Dr. Frederick H. Weston at the Second Annual Wildlife Conference in Wichita Falls April 12, 1954. Dr. Weston is the author of the newly-published book, "Hunting the White-Tailed Deer in Texas."

The title, "Deer Problems and Their Management," is paradoxical. There are no deer problems—they are man's problems. Therefore, let's first go back to see how problems with the white-tailed deer in Texas were created by human action.

The white-tailed deer to Texans today is a source of relaxation. Some hunt him, others photograph him, while others enjoy the aesthetic thrill of watching him. In any case, he provides an escape medium by which man helps maintain his mental equilibrium. To them he is a source of relaxation from which emotional stability is retained in this day of complex living.

The earlier settlers of Texas, however, were interested in him for different reasons, and here I take the liberty of quoting from my book, "Hunting the White-Tailed Deer in Texas."

"The white-tailed deer to them provided both food and a source of clothing, as well as an item of barter with the Indians. He was a staple of diet and a medium of exchange.

"Invading frontiersmen found the white-tailed deer in abundance along the course of waterways over most of Texas. To traders and pioneers, this was a convenient source of meat, and venison therefore became basic to all diet. Deer were hunted for food.

"Deer hunting was to be expanded as more hardy souls came in search of adventure and riches. Soon there were to be skirmishes leading to a war with Mexico and the founding of the Republic of Texas.

Then there was to come frontier trade with Indians. Trading posts followed.

"The excessive abundance of white-tailed deer in the central portion of Texas made of it the center of the young republic's economy and thus contributed to the founding of the present city of Waco. Deer were hunted for their hides, and deer skins became the medium of exchange between whites and the "currency" of exchange with Indians.

"Colonization was to come, and Texas became a state as civilization marched westward, but the white-tailed deer was still the basic item of diet, and his skin was still in demand. Now, however, man's use of land was added to the gun to bring civilization's impact on the white-tailed deer.

"Timber was cut from virgin forests of East Texas, and the deer population suffered. In its virgin state, the open woodland with its understory of intermittent, shade-tolerant, herbaceous vegetation and woody food plants were interspersed by open glades to provide ideal deer habitat. When the large trees were cut, protective shade was eliminated, and this permitted the suppressed hardwoods and underbrush to grow rapidly in the increased sunlight. Soon, dense understory resulted where open woodland existed before.

From the logging operations came a drastic increase in the human population which, in turn, produced an intensive tenant-farming type of economy which depleted both agricultural and grazing land.

"It produced, too, an overuse of game resources, including the sale of deer hides, as well as fresh and cured venison, and the uncontrolled use of fire to "green up" the woods. All changed the piney woods' capacity to support a white-tailed deer population and, probably with other factors, were involved in the drastic reduction of the whitetail's numbers in East Texas.

"Then there was the plow. Fertile soils of the black-



# Management Texas

By DR. FREDERICK H. WESTON

ded to maintain good deer  
what is being done.

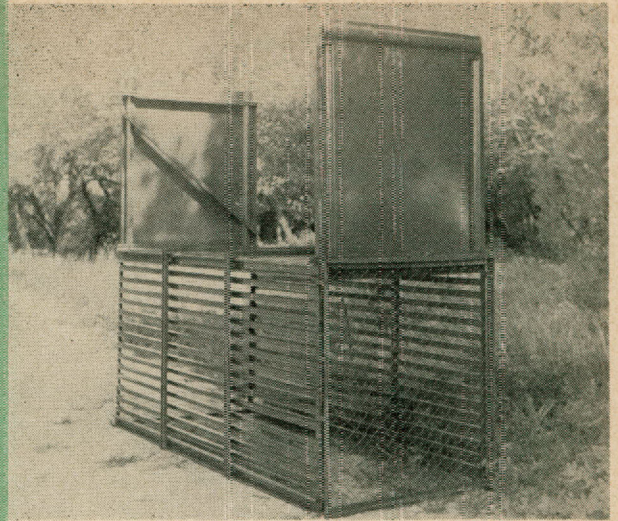
land prairies in Central Texas attracted emigrants who converted the area to cultivation. As land was cleared and plowed, deer were hunted for food and often-times killed for the protection of crops. The area was to become the largest continuously cultivated one in Texas, and from it came the growth of Texas' largest cities. Associated with that growth, sired by the plow, was the disappearance of the white-tailed deer, which can't exist on plowed lands.

"Elsewhere in Texas, man caused changes in the white-tailed deer's habitat. Basically, plains of native grasses mantled the earth. These grasses, with annual Indian fires, kept in check brush and trees and kept them restricted to waterways, arroyos, canyons, and ridgelines. The grasses, however, brought man and his cattle.

"The Edwards Plateau, fondly called "Hell Country," for instance, provided good habitat for deer along waterways and canyons when the first pioneers settled there. Intense grazing by livestock and the disappearance of the Indians, however, eliminated the protection of grasses and annual fires to permit shrubbery and other vegetation to spread. This increased the capacity of the land to support white-tailed deer, and the population increased accordingly. The future danger to deer herds, though, was not apparent.

"When the land would no longer support cattle, sheep and goats were introduced to the range, and they competed directly with deer for the same foods. Overgrazing soon reduced the carrying capacity of the land to support livestock, as well as deer, and an era of deterioration began for the deer herds in this area.

"It was much the same in the area now called the 'Lower Country.' Overgrazing here also eliminated the grass and permitted undesirable thorny and unpalatable brush, now the subject of a war of extermination to spread. In its virgin state, the open grassland was interspersed with mottes of oak, western

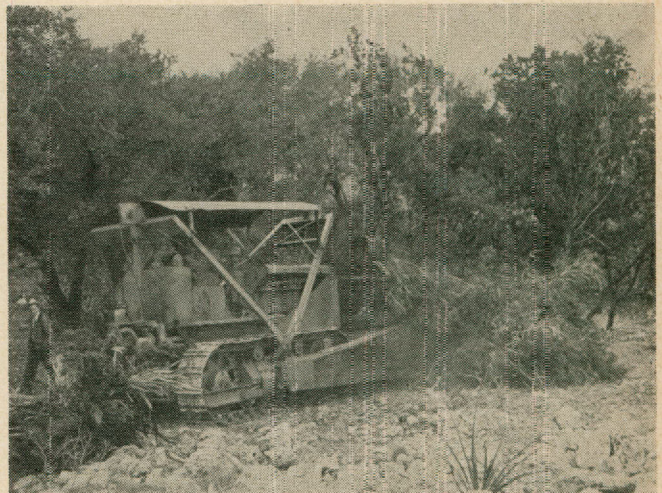


The introduction of stock into areas where native game has failed to survive almost always results in failure. However, good deer habitat without deer is present in some Texas areas. Deer taken in traps like this plus added protection, have provided East Texas with many new hunting areas.

hackberry, large mesquite, and associated species. Such stands were restricted to areas of good soil where favorable moisture conditions were present, and were fringed by the brush species. These usually occurred along waterways and low ground where fertile soil and moisture collected. The brush fringe was held back by the mantle of grass. This, too, was ideal deer habitat, but it was likewise to be changed.

"When overgrazing removed the protective grass mantle, the brush fringe exemplified by guajillo, mesquite, tassajillo, prickly pear, catclaw, and other thorny brush, began to spread. Since they are all very tolerant of dry soil conditions, they covered the range while the oak could rot. It is probable that, lacking other food, cattle ate mesquite beans and scattered them in dung to increase the rate at which mesquite and undesirable brush spread. It is probable,

■ Continued on page 17



Deer, like other wildlife, have suffered most from shrinking habitat. As more land is cleared each year for grazing or farming, suitable range homes for deer decline in number.



# Let's Get Acquainted!

Fourth in a series of articles designed to take you inside your Game and Fish Commission—to show you how the department is organized and how it functions.

This Month:  
**INLAND  
FISHERIES**

Installment IV—By ELLEN SCHMIDT, Staff Writer

If you could get any one of Texas' many anglers off the subject of the size of the fish at the end of his line long enough, he likely would look at you a bit askance if you asked him how much water was in the lake or pond in which he was fishing.

Yet it is an established fact that in the fresh-water lakes, streams, and rivers of Texas can be found more water than within the bays along the 600 miles or more of Texas coast.

The average fisherman probably will find such a comparison interesting, even surprising. But he won't be concerned about it. In fact, he won't even show concern over the future of his favorite pastime until the fish in these waters become smaller and fewer. Only then will he find that this has been the problem of fishery and wildlife experts for quite a number of years.

How did there come to be a scarcity of fish in the first place? What has been and is being done about it? Are present research techniques adequate to meet the ever-increasing demands of the future? These are questions biologists in the Inland Fisheries Division of the Texas Game and Fish Commission are called upon every day to answer.

One reason why fish populations began to decline in native Texas waters before other resources can be best explained by the old-timer, whose memory dates back to the time when poisoning and dynamiting of fish was an everyday occurrence, and "fish fries" were a common social custom.

At the latter, hundreds of people would gather on a stream for a big time; a seine would be stretched across the river from side to side; and its waters dragged and relieved of many pounds of fish. Under favorable conditions (and they were usually favorable), the resulting catch of hundreds of pounds was ample cause for celebration and eating.

It is easy to understand how, with limited means of entertainment, the state's rural population turned

to such diversions and also how a shortage of fish resulted from them.

The general breakdown of fishing in Texas was given official recognition in 1874, when the first fish statute, prohibiting the use of seines in fresh waters, was enacted.

A second statute in 1879 called for the provision of fish ladders at mill dams so that fish could swim over the dam. That law is still effective, according to Marion Toole, chief aquatic biologist for the Texas Game and Fish Commission.

Next step in the management of fresh-water fish in Texas came in 1880, when Game and Fish Commissioner J. H. Jenkins submitted a report showing what other states and the Federal government were doing to check "an alarming decrease in the fish supply." It is interesting to note that the various authorities quoted believed that shad, California salmon and German carp were the "proper" fish for restocking purposes.

It was also in 1880 that a carload of German carp was sent to Texas from Washington by the U. S. Fish Commission and distributed over the state. So determined was the effort of the Federal government to plant anadromous fish which, supposedly, would go to sea to spawn, that by 1882, 1,272,000 shad and 250,000 California salmon had been deposited in Texas streams. And during that year, 1,790 shad and two million herring were added. But, in his report of 1882, Commissioner R. R. Robertson was forced to admit that "nothing has been seen of the shad or salmon since they were turned loose."

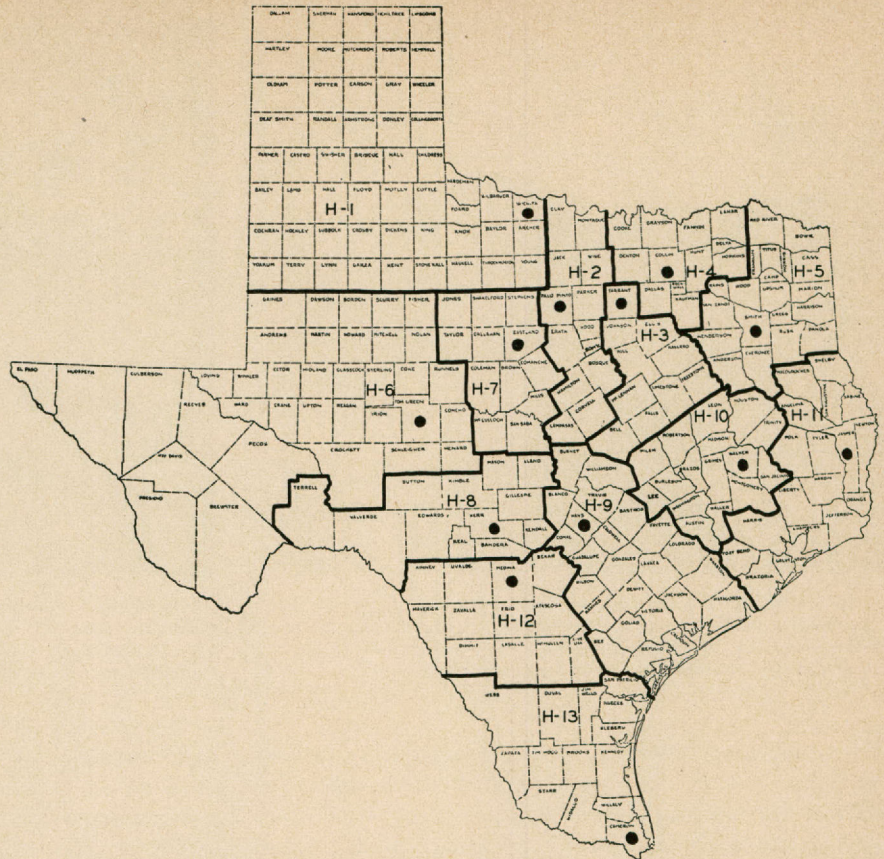
After that failure, the state commission turned its attention to German carp, which already had been introduced in Texas waters, and the Texas legislature made an appropriation of \$5,000 for a small hatchery at Barton Springs on the outskirts of Austin. This was the first state fish hatchery.

• Continued on page 10



## Hatchery Districts:

- H-1 State Fish Hatchery, Dundee
- H-2 Possum Kingdom, Graford
- H-3 Eagle Mountain Hatchery, Fort Worth
- H-4 State Fish Hatchery, Lewisville
- H-5 State Fish Hatchery, Tyler
- H-6 State Fish Hatchery, San Angelo
- H-7 State Fish Hatchery, Cisco
- H-8 State Fish Hatchery, Ingram
- H-9 A. E. Wood Fish Hatchery, San Marcos
- H-10 State Fish Hatchery, Huntsville
- H-11 State Fish Hatchery, Jasper
- H-12 Medina Fish Hatchery, Devine
- H-13 State Fish Hatchery, Olmito



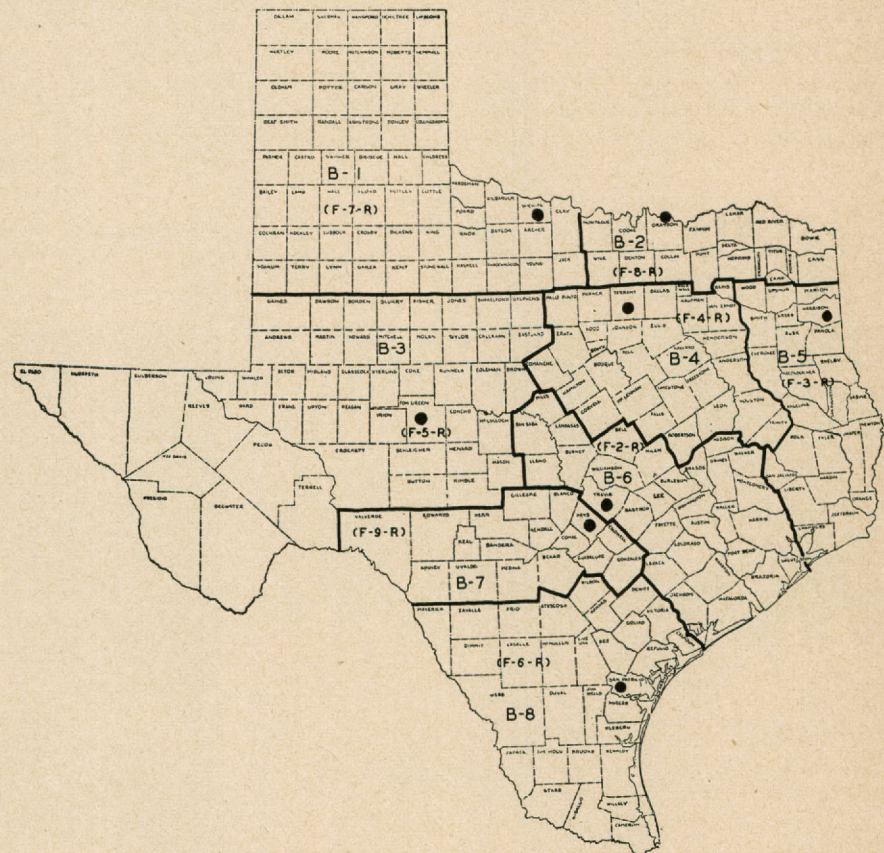
For operational purposes, the State of Texas is divided into 13 so-called hatchery districts (above), which serve the counties in a given area of the state.

The Inland Fisheries Division also has eight biology districts (below), serviced by as many district biologists and field assistants.

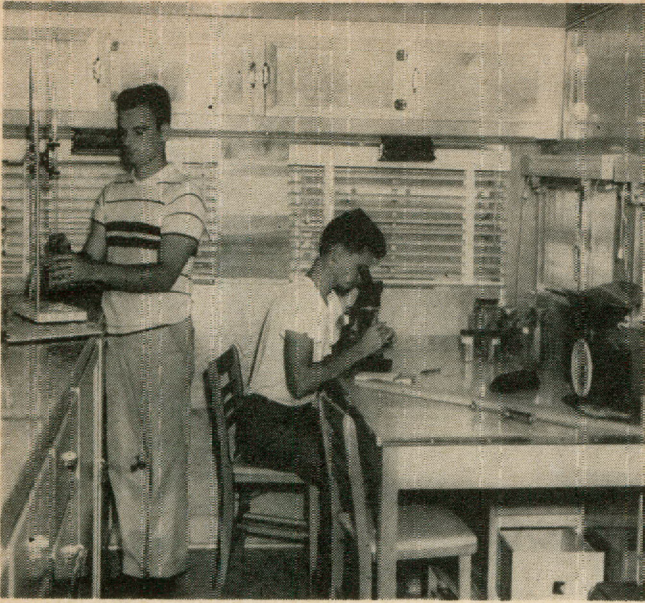
Figures in parenthesis (below) indicate federal project numbers, while large dots in both charts indicate the location of hatcheries and area biologists.

## District Biologists:

- B-1 (F-7-R) Leo Lewis  
3300 Iowa Park Road  
Wichita Falls, Texas
- B-2 (F-8-R) Edward Bonn  
1505 West Johnson  
Denison, Texas
- B-3 (F-5-R) Lawrence Campbell  
18 West 25th  
San Angelo, Texas
- B-4 (F-4-R) Leonard Lamb  
733 Edgefield  
Fort Worth, Texas
- B-5 (F-3-R) Robert Kemp, Jr.  
Box 63  
Marshall, Texas
- B-6 (F-2-R) Kenneth Jurgens  
1506 Ruth  
Austin, Texas
- B-7 (F-9-R) Elgin Dietz  
State Fish Hatchery  
San Marcos, Texas
- B-8 (F-6-R) Edward Bonn  
1505 West Johnson  
Denison, Texas





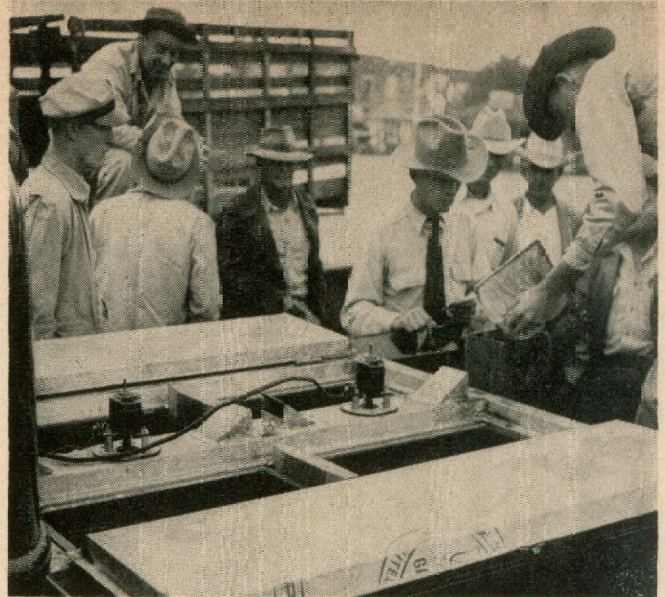
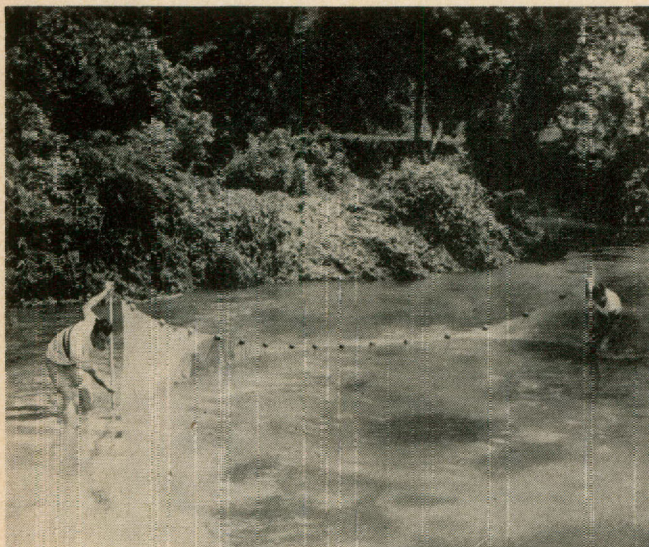


A recent survey on the Guadalupe River by Larry Campbell and Bob Kuehne, aquatic biologists, included a physical, chemical and biological inventory of portions of the river's watershed. Some of these surveys are federally-approved research projects.

It was not long, however, before connoisseurs began to question the carp's food value, and the little hatchery at Barton Springs and similar ventures over the entire United States were abandoned. So great, in fact, was the controversy over introduction of these fish that on March 17, 1885, the Texas legislature abolished the commission and the next commission, created in 1895, and all subsequent commissions were anxious to avoid it.

During J. H. Jenkins' reign as commissioner, the record of the commission gave warning of the "vanishing of aquatic life." In 1891, since the state had made no move in the direction of fish culture or study following abolition of the commission in 1885, the U. S. Fish

Seining for fish has been outlawed for some time now, but Aquatic Biologists Campbell and Kuehne (shown below) are seining to determine the kinds of fishes present in a stream and the relative abundance of the various species of fishes.



Game Warden Adolph Heep aids in the distribution of fishes for restocking purposes to Fredericksburg ranchers and landowners as part of the Inland Fisheries Division's services in providing technical assistance to owners of private ponds and lakes.

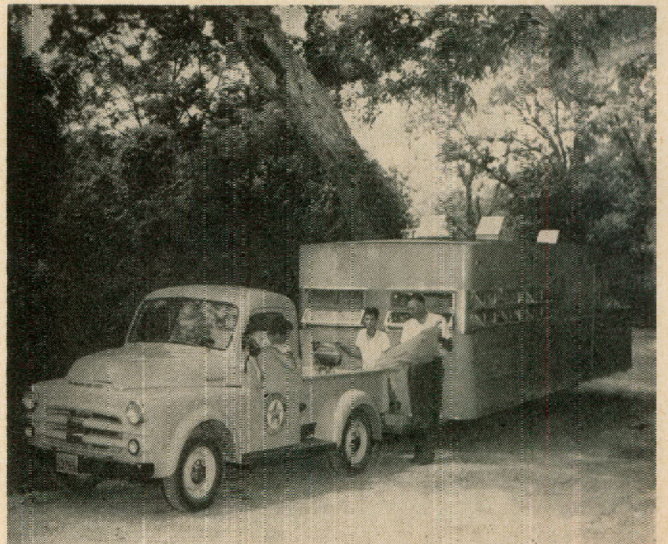
Commission sent Barton W. Evermann and William C. Kendall to Texas to study the situation. Information gathered by these two men resulted in the erection of the first Federal fish hatchery at San Marcos.

As of 1925, Texas had only one state hatchery, and that was at Dallas. But in 1930, there was a new hatchery at San Angelo and two new ones in Southeast Texas—Jasper and Huntsville—in addition to hatcheries at Tyler, Ingram and Cisco. In 1927, a fifth state hatchery was built at Dundee, and 1928 saw the beginning of a fish hatchery at Olmito, making a total of nine hatcheries.

It wasn't long after the establishment of these per-

• Continued on page 22

A well-equipped laboratory trailer seems to fill the bill when it comes to making diversified surveys on Texas streams and lakes to determine their content. Here Marion Toole, chief aquatic biologist lends a hand to Biologists Campbell and Kuehne.





**A special deer season**

for **BOW HUNTERS?**

**YES** . . . say Texas archers  
and here are their reasons

By ROY G. BOWERSOCK

An archer, to be able to have any chance whatever of getting a deer with a bow and arrow, must learn to hunt like the Indian. Because of the short distance at which he can expect to get his game, he must camouflage himself, and learn to slink noiselessly through the woods, creeping through underbrush and crawling through thickets.

Tedious, you say? In comparison with the amount of game he hopes to bag, yes. Yet, even though it is generally agreed that the archer should be given a chance, Texas is the only one of the deer states which does not have a special season for bow hunters.

This is true in spite of the fact that a comparison of average kill distances shows that the bow hunter must adapt techniques entirely different from those of the gun hunter. In 1953, the average kill distance for archers ranged from 30 to 35 yards in different states. The gun hunters' average kill was 113 yards. It was 120 yards in Texas, 175 yards in Wyoming, and 165 yards in Colorado. Based on the averages, it is apparent that many gun hunters got their deer at 200 and 300 yards.

At these distances, it would be practically impossible to distinguish a creeping, crawling archer with a flashing bow from a buck deer.

Add to this the fact that it is extremely difficult to get even this close because of the deer's sense of smell, and you have the additional argument that archers should be permitted both bucks and does since many of the bucks do not follow established trails near deerstands.

To give some idea of the difficulty archers have in taking deer with bow and arrow, the Wisconsin Conservation Department issued a bulletin which showed that over a nine-year period (1934 to 1942), during which time archers were given special seasons ranging up to 30 days, 6,167 licenses were issued to archers who killed only 47 deer. During this period, kills were limited to bucks only.

In 1943, Wisconsin allowed a 45-day deer season to

archers, permitting them to take deer of any sex and any age. Under this lengthy season and under liberal conditions, 46,000 licenses were issued during the seven-year period. During that time 46,000 archers took 1,700 deer—an average of less than four per hundred licenses. Since 1949, from 15,000 to 20,000 licenses have been issued annually, with about 5 percent of the archers successful in killing their deer.

The Wisconsin Conservation Department further states that the total deer taken by archers during the 15 years of the special bow and arrow season was less than the known illegal gun kill during any one single season.

This experience led the Department to conclude that "probably an unlimited amount of bow hunting would have no appreciable effect on the harvest of deer where herd reduction is necessary. The state of Michigan reports a similar experience, with a 6 percent kill.

Paradoxical as it may seem, bow hunting is new. This is true despite the fact that the bow and arrow was one of our earliest weapons. In fact, most anthropologists believe that it was the invention of the bow and arrow which gave mankind the advantage over animals which started him on the road to civilization.

But, after many years of use in hunting game, as protection against the beasts of the field, and for war, the bow and arrow was pushed aside by the invention of better weapons, only to return as a sport.

In the United States, archery started as a sport along the more thickly populated coastal areas, where people were searching for recreational activities. Then it moved to the North Central States, where deer hunting gave it a tremendous boost. Now it has moved into the Southwestern states, where it is growing rapidly.

As a result, Wisconsin was the first state to grant a special bow and arrow season. Since then, the state has extended its archery season and liberalized the

• Continued on page 25



By JAY VESSELS

## WHY IS A WHOOPER?

A Texan, noticing the hubbub over whether the whooping crane will survive, asked point-blank, "What is a whooping crane good for?" In other words, what is all the shouting about? Frankly, so say the career conservationists, it's a very pertinent question. Because they look on the reaction to efforts to popularize the save-the-whooper-campaign as a test of public interest in the fate of wildlife generally. They describe the whooper movement as symbolizing the drive to educate the populace that everybody has a part in helping the Animal Kingdom keep pace with trends dictated by shrinking habitat and increasing hunting pressure.

## AN EXPERT'S SLANT

Marion Toole, Chief Aquatic Biologist for the Game and Fish Commission, would be expected to have his own system for catching fish. But he makes it seem too simple. A neighbor on Lake Austin was complaining about poor fishing. Toole said he could catch a mess of fish off his dock any time he wanted to. When the lake was lowered last winter, Toole spaded out a channel leading toward his dock. He cut deeply, uprooting the moss and other aquatic vegetation. After the water came back up, Toole's channel stood out amid the dense growth. Above all, it serves as a right-of-way for the fish. Of course, Toole also stacked up some brush for the fishes to habitate. Otherwise, he's just like any other cane pole fisherman. Uses angle worms or very small minnows. And he fishes deep—right on the bottom!

## PUBLIC PATRONAGE

The U. S. Engineer's Office reported public interest high in the new San Angelo reservoir area. A typical fall month's attendance record showed: 18,411 fishermen; 2,805 picnickers; 5,265 sightseers; 1,646 campers; and 748 hunters.

## HOW IT HAPPENED

Les Albrecht, who operates a fish business in the picturesque Gulf coast town of Seabrook, says the small-operator shrimping business got started in a strange way. He explained a substantial part of this routine owes its origin to the fact that coastal operators had been unable to meet the great post-war demand for small fishing boat rental. As a result, he explained, a lot of people began buying their own boats and motors to propel them. And then many of them began bringing along their own trawl nets and going for the shrimp concentrations in the shallow waters. The small operators have developed considerable competition for the regular commercial fishermen.

## ALGAE ANALYSIS

The National Institute of Health is subsidizing studies by Dr. Floyd F. Davidson, Baylor University biology professor, to determine whether the plain blue-green algae that grows on Central Texas creeks and ponds have definite medical value. The *Waco Tribune-Herald* reported: "Dr. Davidson is not sure about the toxic properties of the slimy substance, but his hopes for finding a new source of antibiotics sound reasonable enough for the national organization to authorize \$12,828 to finance studies."

## SAD SILT STORY

Texans might well heed the report relayed by the Sports Fishing Institute, quoting the *Minnesota Conservation Volunteer* about Lake Benton in Minnesota. Pioneer records show that this prairie lake of 2,600 acres was from 15 to 24 feet deep. Now, silt from five to 15 feet deep has reduced its depth by almost two-thirds. The tragic part is that the silt once was topsoil. It was washed and blown into the lake from surrounding cropland. Not only is the soil lost to future crop production, but it has reduced the lake's efficiency for fishing.

## TROUT LANDSLIDE

The *Houston Post* carried a photo of four fishermen standing beside a rack containing the dressed carcasses of 183 speckled trout caught in Copano Bay, near Rockport. But the paper's cutlines explained it missed the real photo. The same foursome later caught 323—count 'em, 323—trout in the same place.

## SUPER SERVICE

Game Warden Supervisor Frank Mebane of Alvin gave one duck hunter service beyond the call of duty. This man, who is from Mineral Wells, reported that he had lost his billfold while hunting ducks in the fall of 1953. This last fall, while patrolling that area, Mebane found the wallet in the marsh. It had been soaked and also had been scorched by a late summer marsh fire. But the contents, including \$14 in currency and assorted cards and papers, were legible. The wallet, itself, was remarkably well preserved in the face of the wear and tear. Texas leather, no doubt.



## Press Views Game Notes

### CRANE ALARM MISSED

Neighbors of Game Warden Tom Waddell of Eagle Lake are missing the old reliable warning of impending weather changes. The alarm was sounded by a sandhill crane which made its home on the Waddell place for four years. This crane, with another one, sought refuge there in the spring of 1950, apparently because one of the pair had been shot in the right wing. They grew rather tame and would respond to Waddell's chow-time call. Then, in May, 1953, one of the two cranes took off and sought vainly to entice the other into the air. The flying bird apparently migrated north with other cranes. But the other bird could not fly. This spring Naturalist Waddell took it to Brackenridge Park in San Antonio, where the crane seemed very happy to settle down with two other cranes.

### FROZEN NORTH JUSTICE

Texans enjoying the mild winter and the law and order status at home may like this report in the Minneapolis, Minnesota, *Tribune*: "A record number of deer shining cases have popped up, with 14 automobiles confiscated so far this fall. Francis (Frannie) Johnson, chief game warden, said he had been getting good cooperation with farmers in making arrests. Johnson said the number of arrests may indicate that deer are plentiful, but he said that fines of \$100 to \$1000, plus losing their cars, will soon make the shiners realize it doesn't pay. "Besides," he said, "the shiners often have to spend a night or two in jail, and that doesn't sit well with their families and friends."

### SAME OLD STORY

AP carried a widely used story quoting a famed German zoo director as foreseeing the extermination of Africa's wild animals "during this century." Even the game preserves, he said, "will be wiped out by mushrooming human population. Mankind is definitely dooming such traditional African denizens as the lion, elephant and gorilla." Wildlife restoration technicians have the same problems the world over.

### CRAPPIE CHATTER

Earl Golding, Outdoor Editor of the Waco *News-Tribune*, pointed up the fact that aquatic biologists are discouraging the stocking of small areas with crappie. These prolific fish tend to take over in the smaller areas, and anything with less than ten acres of water surface is considered poor crappie grounds.

### FRIEND IN NEED

A Seabrook seafood tycoon reports good business from folks buying their catch to take home. Big demand for flounder, he explained. "Catch them in our nets," he said. "Buyers usually puncture them to simulate giggering." He told about one poor fellow who forgot to go fishing to get his own evidence for an observing little woman. "Sold him some nice flounder and he had them properly punctured," said the man. "But the fellow was too neat. He needed some mud on his shoes and trousers to complete the disguise. The poor guy asked if it was alright for him to walk off the end of the dock. It was."

### ITCHY KITCHY KOO

A man with a problem walked into Game and Fish Commission headquarters in Austin. He had shot five ducks and all "were heavy with lice." He was routed to a wildlife biologist for the proper authority which was that, certainly, most ducks have lice. "And you can tell him," observed another staffer, also conversant with wildlife pests, that raccoons have fleas—and so do possums. Next!

### MOIST NEAR MISS

Houston A. Maples, superintendent of the State Fish Hatchery at Brownsville, disclosed that inches stood between safety and disaster during last summer's 16-inch rain in that part of the Rio Grande Valley. Maples' bass ponds naturally are in a low area and were hardest hit by the overflow. All the year's young bass production had been distributed. Yet the precious brood of bass numbering almost 1,500 were kept in the ponds. The rains were spread over a week's time, and that meant that the hatcheries' two big pumps had to be run night and day to keep ahead of the flood. "A couple of times we were less than two inches away from flooding the ponds and releasing the big bass," said Maples.

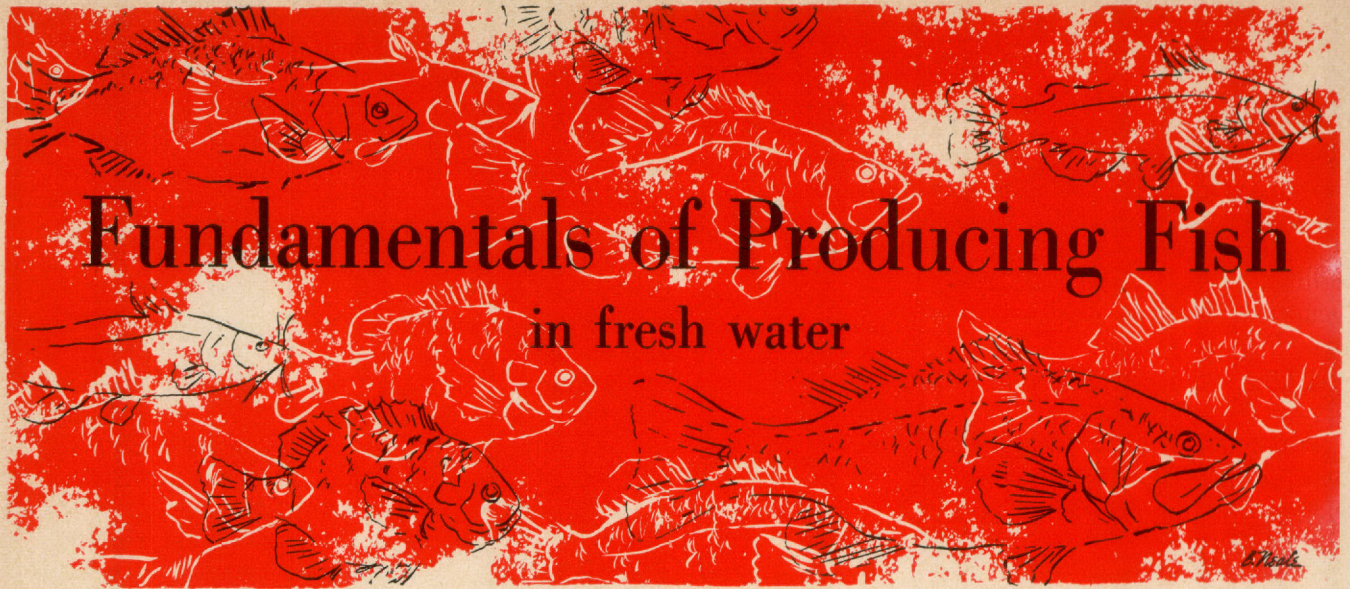
### BOATING TRAGEDY

The common custom of standing up while refueling outboard motors proved fatal for a Duncanville, Texas, man while fishing in Lake Texoma. The Sherman *Democrat* related how he lost his balance, fell overboard and sank while a fishing companion made vain efforts to save him.

### DUCK STAMP BOOM—BOOM!

Game and Fish Commission wildlife technicians are looking to the hunters, themselves, to explain the duck stamp sale increase that has sent Texas into the national lead. Texas hunters last year bought 230,391 stamps, an increase of 79,271 over the previous year. Growth of the waterfowl population seems one good reason. Helping also was the wet fall of 1953 that brought in the ducks and geese and distributed them over a greater area, for the accommodation of a larger number of hunters. Slump in some native game species because of the record drouth may have turned more hunters toward the waterfowl target. Wildlife Biologist J. R. Singleton, who operates the Commission's waterfowl listening post at Winnie, in the coastal marsh country, is particularly interested in available theories.





# Fundamentals of Producing Fish in fresh water

Third in a series by the executive head of the non-profit Sports Fishing Institute.

## Part III

By DR. R. W. ESCHMEYER

**I**N TIMES past, fish laws were made with very little factual evidence to back them. We tended to put more and more restrictions on the fishing, and to increase the warden staff with the expectation of having better enforcement as a result.

The regulations usually involved size limits, closed seasons, and creel limits, though many other types of restrictions were also imposed. Some states still pass arbitrarily-made regulations, others now tend to base their laws on proven need.

Here are a few basic statements which should be carefully considered in the question of fish regulations. We're referring here to hook-and-line fishing only. Commercial fishing will be discussed separately in a later article.

1. Regulations should be aimed at providing a maximum number of successful fishing trips, and a fair distribution of the fish resources.

2. The fish in public waters belong to the people. Regulations should be aimed at giving the public maximum use of the fish resources.

3. Fish are a crop, and a renewable one. They should be used. If not caught within a reasonable number of years after birth, they die of natural causes. The average fish has a relatively short life span.

4. An acre of water will support only a limited poundage of fish. Regulations will not increase the potential standing crop.

5. A lake or stream which is closed to fishing furnishes no angling recreation. Waters should be kept closed only when there is definite proof that this is necessary.

6. We should have only those laws for which there is *proven* need. If regulations have been imposed without proof of specific need, the situation should be

studied to decide what action is proper. Proof that a law is needed should be provided by the state fishery authorities. The proof should be gotten through research conducted by competent investigators.

7. The hook and line is ineffective "harvesting equipment." Our lure must compete with the natural foods. You can get a good picture of the effectiveness of the hook and line if you will "fish" for pheasants, putting a grain of corn on a hook (in pheasant country) and waiting (hidden) for a pheasant to take it!

8. Regulations imposed to preserve the brood stock are generally not needed. A few brood fish can furnish a lot of young. Furthermore, even when a lake is "fished out" from an angler's standpoint, it usually still has a good population of brood fish left. We could understand this if we tried "fishing" for cattle in a big pasture. If the pasture were grazed to capacity, a handful of grass would soon attract a cow. But, as the caught cows were removed gradually, there would be less demand on the pasture. The grass would grow. Soon, taking a cow on a handful of grass would become more difficult. Finally, it would be a rare experience because of the greater availability of natural food.

9. We fish to relax. When regulations are highly complicated, there is the constant fear that we may be breaking some laws unintentionally. Having too many laws spoils our sport.

10. Conditions change. To meet this change, the regulations should be made by the fish and game (or conservation) department. Legislatures lack flexibility, and often tend to give undue consideration to politics.

11. In the past we have tended to regulate only the fishermen. More attention should be given to regulating fish populations.

Other points might be listed, but we'll stop with the



eleven mentioned above.

Sport fishing is generally limited to use of hook and line. Most other kinds of equipment may be too effective unless properly controlled. Too, it is generally assumed that hook-and-line fishing provides greater enjoyment than other kinds of equipment. Most regulations limit fishing to "hook-and-line." This is generally desirable for game fish species.

There is no evidence that a size limit on pan fish is desirable, and considerable evidence to suggest that such limits are undesirable. These species tend to become overabundant. If your state has size limits on sunfishes, crappie, yellow perch, white perch, bullheads, and similar pan fish, chances are that the laws are unnecessary, or are doing more harm than good.

Size limits on bass and trout, and on the big predator game fish such as pickerel, pike, and muskellunge, are probably beneficial in some areas and unnecessary in others. This question needs further study.

Creel limits have a psychological value. A person would be more satisfied with catching a limit of five fish than with catching eight fish if the limit were ten. Saying that we caught the limit implies that we could have taken more if the law had allowed.

This leads to complications, because there is usually no justification for creel limits on pan fish, except the psychological one.

On game fish we should have creel limits on some waters, though fishing has not deteriorated in Ohio as a result of removing all creel limits some few years ago.

On very heavily fished trout waters, a very low creel limit seems desirable.

In general, the question of creel limits needs further study.

We have no evidence that a closed season is needed on pan fish. Year-around fishing for these species seems desirable.

A number of states have discarded the closed season on all warm water fish, thereby greatly increasing the fishing without adverse results.

Where we rely on put-and-take trout stocking, the number of fish

available is determined by the number planted. Here, there is little need for a closed season for that reason.

There are undoubtedly instances where a closed season is desirable. However, at times past, we have often had closed seasons where they were not needed.

For a while we imposed more and more restrictive legislation. Then, when we realized that in many waters most fish were uncaught, that fish are prolific, that waters have a definite carrying capacity, that the hook and line is usually too inefficient to remove all the broodstock, and that fish have a relatively short life span, we moved in the other direction. The tendency today is to liberalize—to have fewer restrictive laws. There is ample evidence to show that this tendency is in the right direction, though there will probably be exceptions. There are instances where we may need even more rigid restrictions. For example, in some states, the creel limit on trout will undoubtedly need to be reduced.

Laws are of little value unless folks obey them. The presence of an enforcement officer in a general area does not prevent violation if people tend to ignore the laws. This point has been well demonstrated in a portion of the southern Appalachians where I lived for a dozen years. Here, there have been enforcement officers (revenooers) for several generations, but moonshining is still a big (though admittedly hidden) industry.

The mere fact that a state has wardens (conservation officers, rangers) offers no assurance that violations will decrease. *Even a doubling of the warden force will not prevent violations from taking place.*

We do obey those laws which we respect. There are few people who would knowingly drive through a red traffic light, even though there was no traffic, and even though it were obvious that there was no traffic cop in the vicinity.

Not long ago we witnessed a case where a drunken driver crashed into a car and then sped away from the scene of the accident. Folks who saw the accident immediately pursued the hit-and-run driver and

caught him, holding him until the state police arrived. They didn't wait for the enforcement officers to do the job—they took action immediately. The public will not tolerate hit-and-run driving.

It all adds up to one thing. We obey a law if we believe in it. If we don't believe in a law, we tend to ignore it even though an enforcement officer might be somewhere in the county (though obviously not in sight at the time of the violation).

We want to be well thought of, that's human nature. If it's unpopular to violate, we'll tend not to do so. If we want less violations, we sportsmen can bring it about; the warden alone, without our active support, can do very little.

For years we felt that the answer lay in employing more and more fish and game "cops," whose sole duty was to detect violation of the fish and game laws and to make arrests. We now realize that this system is of limited value, and that the number of arrests made by the warden is of secondary importance.

In the more progressive states, emphasis now is on prevention of violation, rather than on detection. Prevention is brought about mainly through these two activities:

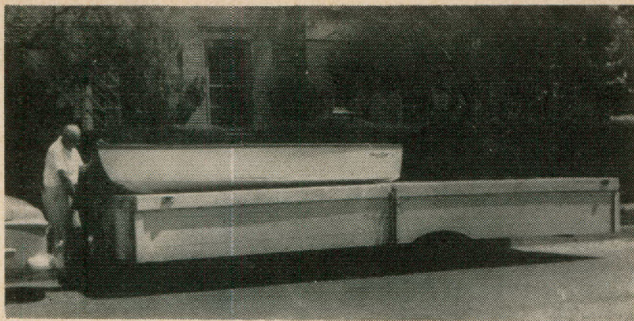
1. A sound, practical fact-finding program to determine which laws are really needed. (A great many people have been arrested at times past for doing the *right thing* conservation-wise).

2. A sound, effective education program aimed at enlightening the public on the need for the regulations. Once the public recognizes the need, violations will decrease.

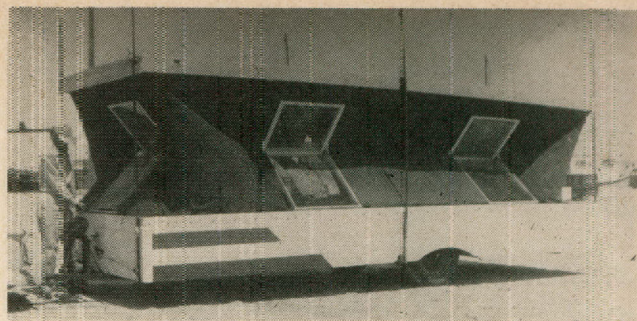
The change in concept, from emphasis on *detection* to emphasis on *prevention*, imposes one basic problem. The old-time fish and game "cop" who enjoys making arrests is necessarily anti-social. There is serious question as to his effectiveness as an educator. The modern warden must be able to educate the public effectively, arresting only the habitual violator who can't be educated. Too, he can do a good job only if the laws are sensible. In some states, the intelligent warden knows that some regulations do more harm than

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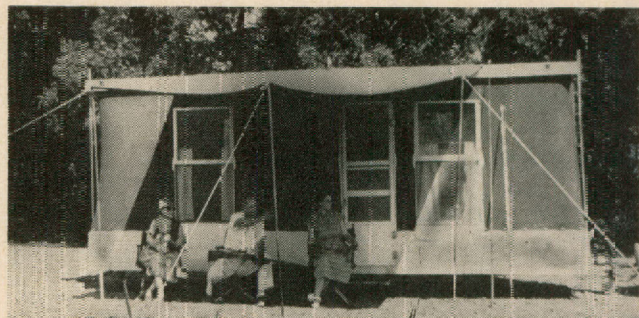
Two-wheel trailer, with boat resting on top, is readied for fishing trip by owner and designer, Cecil Beck.



Winch is used to raise masonite roof as canvas walls and plastic windows are dropped into position.

## Portable Trailer

**San Antonioan's four-man  
trailer meets many needs  
for outdoor living.**



When collapsed, the trailer was only two feet high; now it has standing room and plenty of comfortable living space.

By WES MABRITO

*San Antonio Evening News*

A home away from home.

That could easily be the description befitting Cecil Beck's collapsible camping house trailer the San Antonioan built to accommodate a four-man fishing party or his family on excursions to lake, coast, or river.

Beck, of 1420 McCullough Avenue, built the trailer in his back yard last winter at a cost of about \$500 for materials. Seven feet wide and 20 feet long, the trailer is only two feet high when the roof and sides are down to allow for long journeys. A fishing boat is carried on top of the collapsed roof while traveling.

Upon reaching a camp site, Beck raises the roof by means of a winch, lowers the hinged windows and canvas sides and, after snapping the canvas into place, has a roomy trailer set up for camping comfort.

The trailer can be set up and ready to move into in about 30 minutes, Beck says.

For furniture, he uses folding cots, tables and chairs, and has a gasoline stove, lanterns and an icebox. An electric cord also is handy for use when an outlet is available.

Beck says, "My object was to build a house trailer that was very light and roomy enough for three or four men, or for me and my family. I wanted a trailer that would be easy to move from one campsite to another,

and could be stored in the garage."

The trailer weighs only 1650 pounds, and easily follows behind a car at 60 miles an hour, Beck explains.

Beck already has taken the trailer to Padre Island, Port Lavaca and Granite Shoals Lake, but he said it will be on Padre Island alongside the intracoastal canal during most of the summer months. Some of Beck's friends used the trailer on a deer lease in McMullen County the past winter.

Beck, who operates the C. K. Beck Quilting Company, further explained the construction as follows:

"The sides of the trailer and the floor are made of one by six centermatch. Masonite is used for the roof. Window frames are made of one by two lumber, and clear plastic sheets are used for the window glass."

The trailer can be moved from one camp site to another without lowering the top.

Says Beck, "This trailer is far more comfortable than camping on the ground."

And any camper who has battled the weather elements for any length of time probably will agree with him.

Popular Mechanics magazine thought his trailer so unique that it published a story and pictures of the outfit in its April issue.



too, the overgrazing which removed ground mulch also altered the rainfall to make the area more arid and thus more conducive to dry, soil-tolerant brush.

"Deer suffered from new parasitic infestations from close association with domestic livestock on the range. Combined with their own parasites, which do not affect livestock, the cumulative effect from this source was a drain on the vitality of deer herds.

"In those counties, particularly the tier bordering the Balcones Escarpment on the south where sheep were introduced, man's war to eliminate predators from within his sheep-proof fenced pastures, as in the western counties of the Edwards Plateau and the Trans-Pecos country, brought persecution to the deer. Dogs were used to run down predators, but a dog wouldn't pass up a deer. Man, therefore, callously killed any and all bayed deer in order that his dogs would get on with the business at hand.

"To come were rice, cotton, oil operations, sulphur, and other agricultural and industrial operations to further violate deer habitat over the entire state.

"In the meantime, market hunting continued. As late as 1905, deer were killed for their hides. Man, though, was beginning to give some thought to conservation of resources. Doe deer were protected by a law enacted in 1903. To come were a closed season and bag limits, first six bucks, then three, and two as the current law holds. Headlighting was to be outlawed, and urban dwellers were to bring an impact of importance to the deer herds by converting deer hunting to a sport instead of a commercial killing venture.

"Landowners saw an opportunity for another source of income in selling hunting rights to hunters who were beginning to reach the back country with automobiles. The first game protective association was formed by ranchers in 1911, and protection for deer began in earnest. Sportsmen joined the landowners, and the upward swing for the white-tailed deer in Texas began. Protection against illegal hunting was a

fact. There were, of course, law violations. The brush country, particularly, ignored the law. Here hunting deer by headlighting was continued, while in the piney woods of East Texas, deer were hunted with dogs. These most destructive conditions still exist.

"Restocking in depleted areas was to follow. The state began a program of restocking in the early 1930's on a rather meager scale. Federal funds derived from taxes on guns and ammunition under the Pittman-Robertson legislation were made available to Texas in 1938. By 1939, a large-scale deer transplanting program began to restore them to suitable areas where they once occurred. The program is still in existence today.

"Thus the white-tailed deer has been associated with the development of the Texas frontier. With a little help from man, he has adapted himself well to the encroachment of civilization. He, alone, remains of the big game animals which were once abundant in this vast land. He is destined to remain, for he is part of the economy of Texas. Hunting white-tailed deer in Texas is big business."

"And since it is big business, it should be managed as such. That brings me to my assigned subject, Deer Problems and Their Management."

Before any problem can be solved, it must first be resolved. Resolving the deer problems in this state is different, because the great number of miles and the varied ecology involved localize problems in each of the widespread areas where deer occur. What applies to one given area does not necessarily apply to the others in whole, but it might apply in part by relativity. That relativity, therefore, permits me to generalize the problems under the following headings: land use, malnutrition, hunting pressure, unwise hunting laws, public education, and weather. They will include some remarks on restoration, protection, law enforcement, and research which are enmeshed with the overall problem.

Now, let's discuss them in turn, although each is inseparable from

the others.

Man's use of land, as my introductory remarks bore out, has had a terrific impact on our deer herds, and it continues to do so. Not only has the vegetative capacity of the land to support deer been altered, but also, there has been added domestic livestock to compete with deer for that altered food supply.

"I could go on and on, enumerating more drags on our deer herds created by the impact of man's use of land, including the commercial exploitation of deer hunting, but we must face one fact. The high income from hunting leases notwithstanding, the landowner's major source of income is his land, and use it he will, to the straining point of its capacity to support livestock and other agricultural activities. He is going to make it produce as much as it can as fast as it can. Fortunately, however, range management forces are in action which have increased the interest in better land-use practices.

Malnutrition in our deer herds is an end product of land use, for sick soil is the causative factor. From the soil springs all life sustenance in a complex series of food chains. That sustenance is an equally complex formula of minerals, vitamins, and other elements used by living tissue. The key to this formula is plant life, for plants convert such inorganic matter into living tissue as the beginning of a food chain.

The food chain for man, for example, begins when grass converts inorganic minerals to plant tissues, then the steer eats the grass, and man eats the steer. Thus if the soil does not include the minerals required by living tissue, it affects the plant, the animal which feeds on that plant, and the other flesh eaters which feed on that animal.

Most of the virgin soil of this country, though not alike in mineral contents and other characteristics, contained the elements needed for plant and animal health. The carrot, the beef, and the venison produced by these soils provided our forefathers with the nutrition they needed, but the same food produced on the same soil today leaves the



# GUNS

and

# SHOOTING

By JOHN A. MASTERS

Previous articles have dealt with the selection of a scope for a particular shooting purpose. For the past year, the writer has been engaged in gathering data for a sort of "consumer's guide" on scopes, with the hope of helping shooters make a good choice.

There are so many scopes on the market that it would require a great deal more time than the writer has available to personally check all of them; however, I have checked enough of them to cover the field, at least so far as price range is concerned, and I am going to report my findings herewith. Please be informed that again, I am not attempting to push a particular make or model.

There are two low-priced scopes available for such rifles as the .22 long rifle and Hornet, Bee, etc. Mossberg makes one, and Weaver the other. I have a Mossberg .22 equipped with a Mossberg M4 scope. The little glass is good optically, but the adjustment turret is not too well designed, and is a bit coarse in adjustments. It is also exposed in such a manner as to make accidental disturbance easy, and has to be handled with a great deal of care.

I also have a .22 equipped with Bill Weaver's B-4, a glass similar in purpose and price. This little scope, as reported earlier, leaves little to be desired, and is, in my opinion, a much better selection. It is rugged and dependable, and the adjustments in the turret are recessed so that accidental disturbance is almost unheard of.

Coming up the line a bit, Bill Weaver's J Series is a good buy for shooters looking for a good glass in

a medium price. These scopes are suitable for use on all rifles, and are rugged, dependable little glasses. The adjustment turret is covered with a cap that unscrews to expose the adjustment knobs in the same manner as the higher priced K series. My only objection to the J series is that eye relief is fairly critical, making the job of locating a moving target a bit more difficult.

Getting on up the line, Weaver has recently announced the K-60 series, a new streamlined, improved version of the K series long popular with shooters. This is fine medium-priced glass, available in everything from 1X through 10X. I own several Weaver scopes, including a 3X, 4X and a 10X. The best group I ever fired was with the 10X.

For the average shooter, this is as good a scope as is necessary. The Weaver line is a fine group. The optical properties are good, the external appearance is pleasing, and certainly, the glasses are rugged and dependable. It is desirable with Weaver scopes, and for that matter, any scope, to have a good mounting job. As one gets the reticle a bit out of center, windage tends to affect elevation, and vice versa. This is, however, not much of a criticism, since once the average shooter has his rifle sighted in, he will not change it frequently enough for this to matter.

Another line of scopes comparable with Weaver in both price and performance is the Norman Ford Texan line. I have a 4X and a 6X, and both are fine glasses. I would prefer a finer cross hair in the 6X, but this is a matter of individual preference.

Adjustments on the Texan line is good and so far, mine have not exhibited any tendency to change

with constant pounding on a heavy recoil rifle. Norman Ford has a fairly complete line, featuring both double adjustable types designed to work on fixed mounts, and non-adjustable types designed to work with adjustable mounts. Again, these scopes are sufficient for nine out of ten shooters, and leave little to be desired.

Another scope in this price range is the Lyman All-American 4X. I can see little difference in this scope, and either the Weaver 4X or the Norman Ford Texan 4X. It received a great deal of publicity, but it, for my money, is just another good medium priced 4X scope.

Dave Bushnell's line of rifle scopes are comparative newcomers to the American scene. These beautifully streamlined glasses are made in Japan and marketed in this country. I have fired a good many rounds from behind Bushnell scopes on my own and other rifles in the past few months.

One Bushnell 6X was fitted to a rifle I was using to check barrel wear. For over 2,000 rounds, this glass took a savage beating, and I was not able to find that it suffered any damage.

Dave's line is complete from 2½X through 10X. His glasses are well made, have good dependable adjustments, and are very clear and bright. They are particularly pleasing in appearance. I rate them on a par with Weaver and Norman Ford, and the aforementioned Lyman 4X.

The only flaw I ever found in any Bushnell scope is the tendency of the field to be distorted a bit out on the extreme edges. This is a technical point, and has absolutely nothing to do with the usability of the instrument.

Getting now to higher-priced



scopes, we come to the Stith line. So far as I am concerned, there is no better scope available regardless of maker or price. I have two, a 6X and a 4X. Both are fine precision instruments, gin clear, with no distortion anywhere in the field. These glasses are extremely bright, and are beautiful, streamlined instruments. The adjustable models feature a turret with coin slotted screw adjustments under a dust cap, and the graduations mean exactly what they say. You get exactly the movement the dial indicated, and windage positively will not affect elevation, or vice versa. If you want the best available, by all means choose a Stith. They are available in 2½, 4 and 6 powers. I use my 6X for the longest-range varmint shooting, and find that I rarely need anything more.

Another top-quality glass in the same price range as the Stith is the Weatherby Imperial. These German-made beauties are treading right on the heels of the Stith line, and are little, if any, behind in my opinion.

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## Unusual Texoma Derby Ends

A rousing Derby Day climax on December 4 to a 12-week-long fishing derby gave a Frederick, Okla., angler, Floyd Mabry, a new car for a six-pound, 12-ounce black bass.

The unusual fishing derby was sponsored by the Lake Texoma Association to accent the fall fishing season at Lake Texoma.

Hundreds of anglers weighed in more than 2,000 large fish during the six two-week periods and shared in \$10,000 in prizes that ranged from a fishing lure to a new car and included boats, motors, rods, reels and myriads of fishing and marine equipment.

The derby was divided into six preliminary rounds of two weeks each. Three species of fish—black bass, white bass, and crappie—were eligible for entry. The two anglers catching the largest fish in each of these divisions was declared winner of that two-week preliminary round and was given a spot in a final Derby Day "fish-off" December 4.

In the event of a tie—and there were three—for either first or second spot, those tying shared the prizes

The 6X I have been shooting behind is a marvel of perfection when adjusting during the sighting-in process, and is as bright and clear as any scope I have ever seen. The line features concentric windage and elevation controls and a focusing knob under the other dust cap. This is a nice feature, and should find acceptance by other makers in the future.

I have my 6X on my 25-06, and I have high hopes of busting a buck with it this year. The cross hair is just a bit heavier than the 6X Stith and, as such, a little less desirable at long ranges when varmint shooting.

In my opinion, most shooters will be perfectly satisfied with one of the medium-priced glasses discussed earlier. If, however, you want the best, the Stith or Weatherby has the edge on the lower-priced glasses, and are worth the difference in cost.

Any glass discussed will serve you long and well with proper care, and will immensely increase your shooting pleasure.

and each qualified for Derby Day. Thus, instead of 36 qualifying, there were 39 anglers eligible for the final round.

The only thing the anglers had to do other than catch a black bass, sand bass or crappie was to purchase a \$1 derby ticket. The money taken in helped bear the cost of operating the derby.

The association purchased the new car that was given as first prize, and the nation's fishing and marine equipment manufacturers donated most of the other prizes. There were such major awards as Johnson and Evinrude motors, Corsair, Continental and Arkansas Traveler boats and other major contributions from the Yellow Jacket Boat Co. Inc., and the resort owners themselves.

Fifteen week-long vacations for two at Texoma were given away, most furnishing rooms, boats and motors. However, on derby day, second prize was a complete week for two at Island View Camp, complete with room, meals and the works.

There were rods, reels, fishing line, fishing lures by the thousands. In

## Shootin' Shorts

A recent sample of the Boone Gunscope came my way, but so far, I have not had a chance to get it on a rifle. It is an interesting little sight, and I will tell more about it as time goes on.

Another interesting sample to come my way is the new Frontier model revolver being marketed by Hy Hunter on the West Coast. Mine is in .38 Special, and has proven to be quite accurate.

Hy has done a nice job of duplicating Colts Frontier, and is to be commended. To those of us who love the old Peacemaker, it is good to see one in modern steels with a few of the bugs taken out. I think this is as fine a pistol as one can come by if he likes the single action style. The gun is well made, beautifully blued, and an exact duplicate of the older Peacemakers except for hammer and firing pin.

Handloaders will find that Sierra has a bullet weight and caliber for just about anything you can dream up. These fine, uniform bullets leave nothing to be desired, and I have been using them in all calibers and weights with complete satisfaction for years.—J. A. M.

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fact, Whopper-Stopper Bait Co. of Sherman and Brooks-Edson of Dallas each staged a special deal and gave a lure to every 1½ pound crappie registered during certain derby periods and to every 5-pound black bass during other periods.

Texoma's 32 resorts served as official weighing stations during the 12-week qualifying period for derby day. Then on Dec. 4, six special weighing stations were set up at meat markets in towns around the lake.

All derby contestants were accompanied by judges on derby day and the derby winner was selected on a percentage basis geared to Texoma's records of 12-pounds, 1-ounce for black bass, 4-pounds, 15-ounces for sand bass and 4-pounds, 4-ounces for crappie.

The winning black bass beat out a 2-pound, 5-ounce crappie by .011 percent, or if you prefer, one single little ounce.



# Good Landowner Relations Are Asset to Hunters

By ALAN PLUMMER

*From the Beaumont Enterprise*

Since most surrounding area is fenced for farming and cattle raising, hunting presents a problem to both hunter and farmers.

No longer can you expect to drive out on opening day, slap the farmer on the back, stick a cigar in his

mouth and then expect to hunt all you like. But simple courtesies and genuine year-around friendship, coupled with good sportsmanship and an earnest desire to do the right thing, can and will break down the growing barrier between farmer and sportsman. No matter how sincere a

group of sportsmen is, the farmer well knows there will always be some hoodlum along to damage property or kill his livestock and leave him holding the bag. We might as well face this fact, for the quicker we realize that we definitely must provide protection for the farmer against such hoodlums, the better, or we cannot expect to continue the sports of hunting and fishing.

The problem of breaking down a long standing and growing feud between the farmer and sportsman is serious and this minority group of careless hunters each year makes the task more difficult. Most sportsmen respect the farmer's rights and are banding together in various organizations or clubs to combat hoodlum hunters. The sooner we realize that the day of becoming friendly with Mr. Farmer in the fall during hunting season only is over, the quicker farmer-sportsman relationship will improve. A true sportsman will cultivate the farmer's friendship and establish the acquaintance on a year-around basis.

The Wayne County Sportsman's Club of Michigan has come up with one of the most effective and novel plans ever devised to improve farmer-sportsman relations and at the same time give the farmer adequate protection against the careless or hoodlum hunter. This progressive sportsman's club has for its slogan "Ask the farmer first," and the club's plan hinges on a card of introduction issued to each member that guarantees protection to members dedicated to the cause of conservation and sportsmanship.

"We ask you to allow him to hunt—with the understanding that he will observe all laws and conduct himself as a gentleman and a sportsman. If after he has finished hunting you find that he injured your property or livestock in any way, upon showing of proof you will be compensated for the damage done—not to exceed \$100. As a member of W.C.S.C. he has the good name of his fellow sportsmen in his hands and we do not contemplate that he will dishonor it."

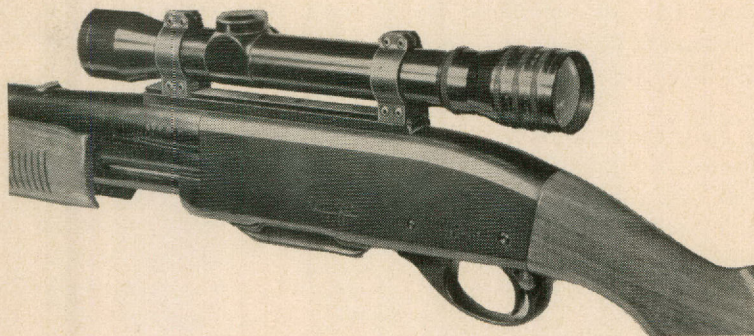
## LIKE A SEARCHLIGHT ON YOUR TARGET

### STITH BEAR CUB 4X

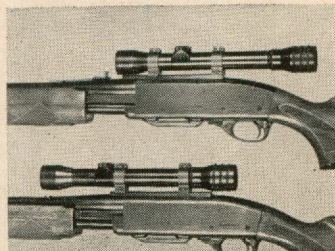
**gives you unequalled seeing  
power to accelerate your  
shooting skill.**

No matter how dense the woods, how dull the day, how early or late you shoot, a Stith 4X scope floods your target with light—for fast, sure hits.

4X Double — \$85.00  
Dovetail Mount — \$15.00  
(For Sako or Brno, \$20.00)



Rugged Dovetail Mount by Stith allows wide variation in forward-or-back scope position to custom fit the individual rifleman.



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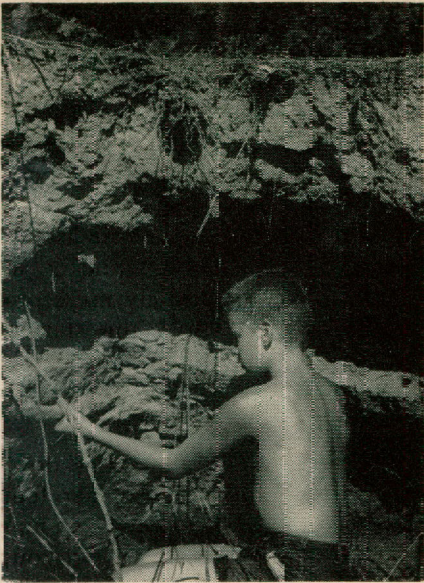
# Wheels of Erosion

The mad rush to till the soil without taking precautions to hold it on the land for future use long has threatened to shorten the useful life of our lakes. Siltation by soil from upper watersheds is filling our lakes and reducing their volume at surprising speed.

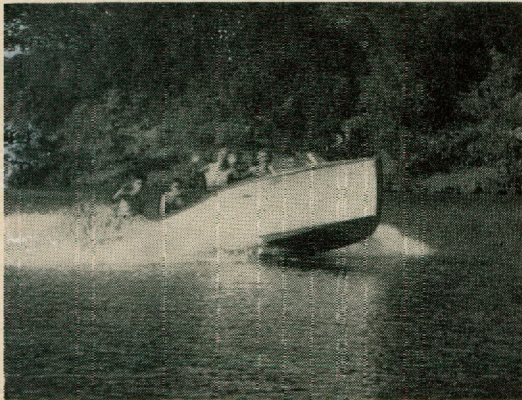
Now that hundreds of Texans are living closer to the state's expanding number of reservoirs, a new threat is becoming apparent. Many lakeside residents who have failed to wall their shorelines are finding that their holdings are shrinking due to erosion from wave action.

All along the shores of Texas' big reservoirs, the land is being washed into the lakes to add to the bottom silt from the watersheds above. The accompanying photos show how waves, particularly those from passing boats, have eaten into the shoreline of a typical reservoir, Lake Austin.

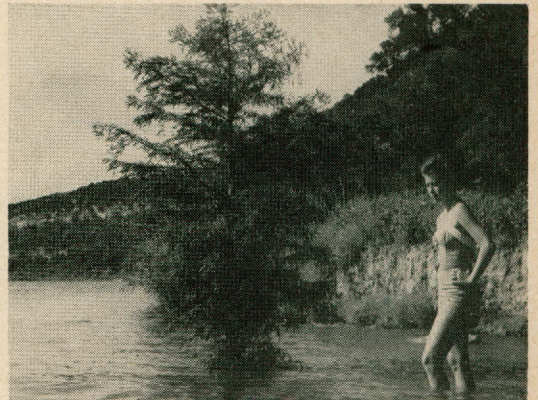
The answer? It must come, like that for the prevention of upstream siltation, from a new field of thinking and planning—all linked to check erosion's ghastly toll.—Jay Vessels.



Flashing waves have cut deeply into this shore area. Gordon Fowler notes a tree root as it tenaciously tries to check the ruinous process.



Waves from the speeding boats of fishermen and pleasure riders are more damaging than those caused by wind.



Harriett Olsen wades beside a tree where once there was dry land. Wave action pushed back the shoreline.

## Deer Management in Texas

present generation suffering from a hidden hunger, no matter how much is eaten. This sad state of affairs resulted from the overuse of land which took the minerals and other elements needed by living tissue from the soil, one at a time, without replacing them, until depletion occurred.

Malnutrition provides fertility for the reception of disease. An analysis of plant and animal life over the last century proves this. Crops and orchards are subjected to attacks of blight, insects, and susceptibility to disease unheard of in the early days of this country. Medical records reveal the incidence of degenerative and deficiency diseases in man have rapidly increased. Sick soil thus has produced sick vegetation, sick man—and, sick deer.

Yes, the Texas white-tailed deer is suffering from malnutrition, just like the hunter who stalks him, and the hunter's livestock. It is not the amount of food involved. Rather, it is the quality. By the same token, it is not the malnutrition of the year involved. It is the diet deficiency of years accumulated from deer generation to deer generation in ratio with overgrazing which has produced barrenness, reduced size, small antlers, susceptibility to disease, and die-offs in our deer herds.

Deer and man will remain sick so long as the soil which supports them is sick. The soil will remain sick so long as man takes everything from it while returning nothing, but man has a better chance because he can manipulate his own habitat. The white-tailed deer cannot, and thus

must live on sick soil unless man gives him a hand. We are all here today because we are interested in giving him a hand.

Hunting pressure is an ever-increasing problem. This situation has created a lot of competition for available hunting areas and thus produced hunting saturation. I heard of one 1200-acre pasture in Bexar County which had 15 hunters on it each and every day of the open season last year, and I call that hunting saturation. Thus, with so many hunters, and not enough land for them to hunt on, law violation is encouraged. Frustrated individuals take to road hunting, headlighting, poaching and such other activities as may be needed to fulfill their desires to hunt deer.

Obviously, if the pressure is to be

● Continued on page 26



manent fish culture stations that the commission, realizing the need for technical assistance, hired Dr. H. A. Wiebe, formerly of the U. S. Bureau of Fisheries, to work out means and methods of increasing its hatchery yields.

By that time, it had become apparent that the hatchery was not the cure-all for better fishing, and the first work on lakes was begun. In 1939 came the improvement and enlargement of existing hatcheries, the addition of stations at Dundee and Olmito, moving of the Dallas hatchery to Lake Dallas and erection of Medina hatchery, tenth state fish culture station, at Natalia.

The years 1939 and 1940 also brought recognition of the fish's growing importance and the realization that every measure should be taken to facilitate its increases to satisfy public demand. It was during this fiscal year that the Legislature approved funds for three aquatic biologists to do everything possible to facilitate fish hatchery production. A survey of lakes was also begun.

Although much of this work was discontinued during the war, the commission purchased the Blue Ribbon minnow hatchery, below Eagle Mountain Lake near Fort Worth, which became known as the Eagle Mountain State Fish Hatchery. Soon after the war, aquatic biologists again became available, and several were added to the Inland Fisheries staff to make a resident study on Eagle Mountain Lake and Lakes Texoma, Worth, Kemp, Wichita, Diversion and Archer.

In 1949, dedication of the A. E. Wood State Fish Hatchery at San Marcos marked the incorporation of a fisheries research laboratory, and another biologist was added. Then, in 1949 and 1950, two additional biologists were employed, one to work on Lake Travis, the other on Caddo Lake.

With the addition of a thirteenth hatchery at Possum Kingdom and the assignment of still another biologist to San Angelo came the creation of so-called "biology districts" for the State of Texas.

Support of this additional resident

biologist was made possible by Dingell-Johnson funds—Federal aid designed for the support of Federally-approved research projects. Biologists became "project leaders," who devoted 60 percent of their time to Federally-approved research and the remaining 40 percent to helping out with local problems.

At the same time, each biologist was given an assistant biologist, who acted as assistant project leader in Federal research and development projects, and two field assistants, who also helped in reasearch work.

As a result, 90 percent of all research and management conducted throughout the state consists of Federal aid projects made possible through enactment of the Dingell-Johnson Bill, which defrays 75 percent of the cost of all projects approved by the U. S. Fish and Wildlife Service.

In the course of the past year, for instance, eight basic research projects have been in operation, along with one developmental project and one combined fisheries-wildlife unit. In June 1954, two new developmental projects were approved.

Current and completed projects include the following:

**Fish Management Service:** Technical assistance is provided to the owners of private ponds and lakes. Fish population surveys are made, and recommendations for rehabilitation of their waters given them. Information is given to the owners concerning chemicals and the application of same for fish population control, aquatic vegetation control and fertilization.

Fisheries technicians also assist wardens on pollution investigations outside of project waters, and fish hatcheries with fish cultural problems.

**Lake Corpus Christi Water Hyacinth Control Project:** The control of water hyacinths through the application of an alkanolamine salt of 2,4-D by boats, since state law prohibits the spraying of 2-4D by airplane. About 625 acres of Lake Corpus Christi will be treated.

Fisheries Investigations and Surveys of the Waters of Region 1B (see

map): To make physical, chemical and biological inventory on Lake Kemp in Baylor County, Lakes Diversion and Kickapoo in Archer County, pollution study to determine nature and undesirable species control, beginning with lab experiments on concentrations of various toxic substances.

**Fisheries Investigations and Surveys of the Waters of Region 2B (see map):** A physical, chemical and biological inventory on the Upper Sabine River watershed within Collin, Hunt and Hopkins Counties; on Lakes Texoma within Cooke and Grayson Counties and Lavon and its drainage in Collin County; creel census on Lake Lavon, check on commercial catch of rough fishes from Lake Lavon; pollution study to determine nature and influence on project waters; white bass tagging experiment in Lake Texoma; and experimental stocking of exotic fishes in Lake Crook in Lamar County.

**Fisheries Investigations and Surveys of the Waters of Region 3B (see map):** A physical, chemical and biological inventory of those portions of the Middle and South Conchos Rivers within Tom Green, Irion, Reagan and Schleicher Counties; on those portions of the North Concho River and its tributaries within Tom Green, Coke, Sterling and Glasscock Counties; on Lakes Nasworthy and San Angelo in Tom Green County; on Oak Creek Reservoir in Nolan County; and on Lake Brownwood in Brown County; creel census on Lake Nasworthy; and pollution study to determine nature and influence on project waters.

**Fisheries Investigations and Surveys of the Waters of Region 4B (see map):** A physical, chemical and biological inventory on those portions of the Brazos River watershed within Palo Pinto, Parker, Hood, Somervell and Johnson Counties; on those portions of the Bosque and Leon Rivers within Erath, Bosque, Hamilton, Comanche, Coryell and McLennan Counties; Lakes Whitney in Hill and Bosque Counties, Possum Kingdom in Parker and Young Counties, and Benbrook in Tarrant County; creel census on Lake Whitney; pollution study to determine



nature and influence on project waters; and check on commercial catch of rough fishes in Lake Whitney.

Fisheries Investigations and Surveys of the Waters of Region 5B (see map): A physical, chemical and biological inventory on portions of the Little Cypress, Cypress and Black Cypress Bayous within Marion County; the portion of the Sabine River within and along the boundaries of Gregg County; Caddo Lake in Marion and Harrison Counties and the Tyler City Lake in Smith County; creel census on Caddo Lake; pollution study to determine nature and influence on project waters; and check on commercial catch of rough fishes in Caddo Lake.

Fisheries Investigations and Surveys of the Waters of Region 6B (see map): A physical, chemical and biological inventory on portions of the Leon, Lampasas and Little Rivers which lie in Bell County; portions of the San Gabriel River and Brushy Creek within Williamson County; and Lake Travis in Travis and Burnet Counties; creel census on Lake Travis; pollution study to determine nature on project waters; and check on commercial catch of rough fishes in Lake Travis.

Fisheries Investigations and Surveys of the Waters of Region 7B (see map): A physical, chemical and biological inventory on those portions of the Devil's River, excluding Devil's Lake and Lake Walk, within Val Verde County; on those portions of the Medina River, excluding Medina Lake, within Medina, Bandera and Bexar Counties; on Lake Medina within Medina and Bandera Counties; Woodlawn within Bexar County, and Devil's Lake within Val Verde County; creel census on Devil's Lake and Lake Medina; and pollution study to determine nature and influence on project waters.

Fisheries Investigations and Surveys of the Waters of Region 8B (see map): A physical, chemical and biological inventory on those portions of the Nueces River lying in Zavala, Dimmit, La Salle, McMullen, Live Oak, San Patricio and Nueces Counties; on those portions of the Frio River within Zavala, Frio, La Salle, McMullen and Live



## Dogs Hound Men

Back up you hound dog men. These pooches look like the real field type and they sound like any old coon dog. But they're not for hunting. They're bloodhounds — strictly for the man hunt.

Sheriff Leon Jones (right), shown here with the pack, along with Game Warden Raymond Martin, says the dogs "have been trained away from ordinary hunting."

Jones said he had been out with the pack at night using powerful flashlights that picked up deer eyes "by the dozen," but that the hounds never strayed.

"Won't even chase a house cat,"

added Warden Martin, who has used the hounds occasionally when unusually severe game law infractions are involved.

Jones has his mobile outfit ready around the clock and carries the four bloodhounds in an ordinary trailer, along with two indispensable horses.

Sheriff Jones, who formerly was a game warden in Angelina county, said the hounds are "more than persistent." One pooch followed the scent of a Nacogdoches criminal right into the man's bedroom and was actually in bed with the terrified fugitive when the law caught up with him.—J. V.

Oak Counties; on those portions of the Atascosa River within Atascosa and Live Oak Counties; on those portions of the Guadalupe and San Antonio Rivers within Wilson, Karnes, Goliad, Victoria and Refugio Counties; on Lake Corpus Christi within San Patricio and Live Oak Counties; on Falcon Lake, on the Rio Grande River in Starr

and Zapata Counties; and on Lakes Bentsen and Lake Del Orchard in Hidalgo County; creel census on Lake Corpus Christi; a check on the commercial catch of rough fishes from Lake Corpus Christi; pollution study to determine nature and influence on project waters; and experimental spraying of water hy-

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# IF THE SHOE FITS

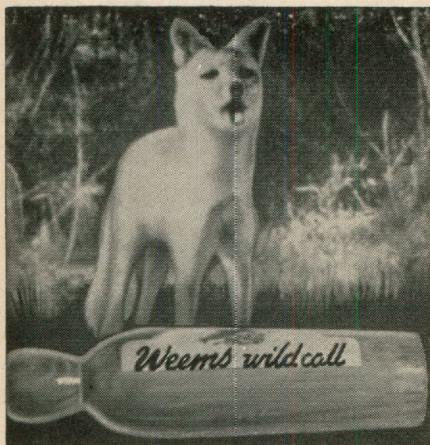
BY A. H. RAY

If you are a guy that thinks it's smart  
To go out and violate the law,  
You should see yourself as others do:  
As despicable a guy as you ever saw.

The buck you slip around to shoot,  
That cost you nothing, you think,  
Might just as well have been stolen.  
In a real sportsman's book, you stink!

He buys his license and pays his lease  
On prospects he has seen;  
You go sneaking out and spoil it all;  
Now don't you feel sort of mean?

You laugh and brag around your kind.  
Yes, it's funny to your little clan.  
For once, try acting like a sport,  
And see how it feels to be a man.



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CALL IS 4" x 1" BEAUTIFULLY  
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## Fish Fundamentals

• Continued from page 15

good. He can't sell, effectively, something which he knows is wrong.

The warden is an important figure in fish and game conservation. He will be an even more valuable figure when he has only properly tested regulations to enforce, and when he directs most of his activities toward *prevention*, less toward *detection*. In some instances, this change in program may call for a change in personnel because the temperaments of "cops" and of "preventers" and "educators" may differ somewhat.

Ideally, a state should have only those sport fishing regulations for which there is proven need. We may need to impose emergency regulations at times, without proof of the need for them, but in those instances we should immediately institute a fact-finding program which will demonstrate whether or not the regulation is proper.

Ideally, too, we should have an effective educational program which will generate respect for regulations. Enforcement men should play an important role in this educational program.

Interestingly enough, in those states where these methods (fact-finding and education) are used, the laws are being simplified and reduced in number, and the amount of violation seems to be decreasing rather decidedly. In general, we're much more rational about the regulation question than we were twenty years ago. As a result, in some areas, we now have more and improved fishing, and a growing respect for the regulations.

One of the most encouraging features in modern fish conservation has been the change in the warden. In the more progressive states, these men are now carefully selected on the basis of qualifications for the job. In these states the political warden has disappeared. Here, the modern enforcement man is a highly respected individual and is well versed in conservation problems generally. He attends special schools at regular intervals, so that he can keep up on modern developments, and can compare experiences with the other wardens. He's basically an educator. There is a growing, and proper, tendency to refer to him as a ranger or as a conservation or fish and game "officer," not as a "warden." He's a far different individual from the old-time fish and game "cop." He plays an extremely important role in promoting improved fishing and hunting. He's interested basically in preventing violation of the regulations, but his field of active interest extends far beyond mere enforcement.

One state, Pennsylvania, has separate fish wardens and game wardens. A patronage dispenser could see plenty of merit in having separate wardens for fish and for game; it creates more jobs. But, most people who are genuinely interested in conservation would probably regard such duplication as an unnecessary extravagance.

Though there are exceptions, the regulation picture has been improving immensely—with greatly improved laws, with emphasis on *prevention* of violation, and with high caliber officers on the job. The regulation picture is a very encouraging one.



## Bow Hunters

• Continued from page 11

conditions for archers. The number of hunters has risen from 40 to 20,000. In the past few years, most other states with any appreciable deer population have granted special seasons for archers, and all have witnessed a similar phenomena.

Even though the conditions described above could not be expected to prevail in Texas for a long time, the state could probably expect to issue 300 deer licenses a year for 30 days of pre-season hunting. These 300 archers would probably take less than six deer. But, assuming that the number of bow hunters were increased (as it probably would with a special season), the kill could not be expected to be more than 2 percent.

The answer to the question why archers cannot take leases of their own and restrict the lease to archery hunting is simple. When the gun hunter takes a lease, he can reasonably expect to get a deer, and he can afford to pay a good price. An archer, on the other hand, could reasonably expect *not* to get a deer. Consequently, he cannot be expected to spend that much money to secure a lease. In other words, he is in competition with the gun hunters in securing leases.

If a special pre-season hunt were established for archers, it would benefit the landowner. He would realize a fee from archers, who probably would not disturb his deer herd one iota, and also would collect from the gun hunter. In some cases, fees collected from archers might even cause a lowering of the fees to gun hunters.

People who consider the bow as entirely ineffective have never seen an actual hunting bow in action, or have forgotten how the bow and arrow gave man his edge over the animal kingdom.

Very few people, too, realize the difficulties which beset the archer in hunting with a bow and arrow. In the first place, the arrow is a large projectile approximately 100 times the size of a bullet shot from a rifle. Consequently, the wind resistance is terrific. Furthermore, the arrow takes a sidewise whipping ac-



tion, and this sidewise whip makes it practically impossible to get it through thick brush.

In taking up a stand, the archer usually has to clear some of the twigs to make room for the trajectory. The necessity of having clear shooting lanes results in the bulk of the deer being shot from stands taken along deer trails. Also lessening the archer's chances are gun noises, which cause the deer to alter their habits.

There are some who would conjure up a mental picture of deer running around with arrows sticking out of them and looking like porcupines.

Archery hunters use different types of broadheads but, as a rule, they use either the flat or a three-edged type.

The flat type is about an inch wide and an inch and a half long. It is made as sharp as a knife, and sometimes even as sharp as a razor. When shot from a 70-pound bow, such a head will penetrate a one-inch pine board.

The three-edged broadhead has a distance of about three-fourths of an inch between edges and will cut a hole that one can put his thumb in.

If a broadhead of either type hits a deer in the chest or neck, it is

almost a sure kill. In most cases, the arrow goes all the way through the animal—feathers and all. In the event of a non-fatal wound, it is a good, clean cut, and the deer usually heals quickly. There is no grease or other matter to cause infection.

The archers of Texas are enthusiastic about their sport, despite the fact that each faces long odds against ever killing a deer. Because of the inherent nature of bow hunting, present laws make it almost impossible. Our archers point to the other deer states which have special archery deer seasons and note that this practice has been found satisfactory to all concerned. They hope that their fellow Texans, through the State Legislature, will give bow hunters a sporting chance.



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No intensive spot development will counteract low-quality range conditions. The pasture as a whole must have a satisfactory cover. Birds won't use good spots, such as food patches, if they are surrounded with untenable barrens.

Moderate grazing in tall grass formations, such as the longleaf belt, is better than grazing exclusion. Birds seem to require some open ground to permit easy travel and feeding. Often, there is more food production where grazing keeps the grasses in check, and food availability is certainly higher with some grazing.

Controlled burning is a necessary tool for keeping herbaceous and woody cover in proper condition, and for setting back the dominance of grasses and increasing quail foods, especially legumes and spurge. It is impossible to fully regulate these species with grazing, and the fire also improves the range for livestock. Burning about half of the range each winter seems desirable.

Bulldozing brush often destroys covey territories, and this is a common part of pasture improvement. Enough brushy cover to keep the quail must be saved. This can be

done without materially affecting the pasture productivity. A high quality spot of cover 50 feet square may be sufficient. If possible, it should be in the places birds are already using.

One opportunity for quail hunters, to help preserve their sport, is to exert influence on landowners to preserve essential cover. Timing is the important factor. Usually, the technician is called in after the brush is removed. Waiting until it is gone makes the job of quail management slower and more difficult.

If cover is lacking, it must be developed before anything else can be done to increase quail.

Multiflora rose is superior to any natives or other exotics tried in eastern Texas. Birds use it some after two years and after four years, it makes a livestock-proof fence 6 to 8 feet high.

Where it is needed for a fence and the site is open and well-drained, a continuous row may be planted. Where quail cover is the only objective, 25 plants set three feet apart in a single row appear to be sufficient for a spot. Fencing and good cultivation are required for the first year; thereafter annual

• Continued on page 28

**Deer Management** \_\_\_\_\_ • Continued from page 21

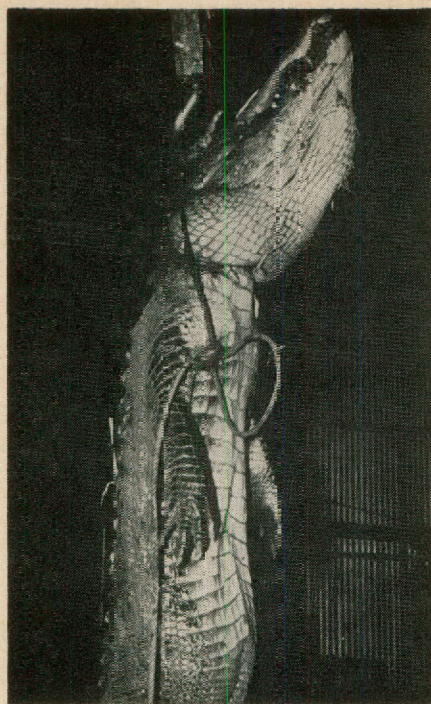
lessened and the associated problems reduced, present hunting ranges must be made to produce more deer, new hunting ranges made available, and pressure diverted to other animals. In the first instance, there is population saturation on a lot of our hunted ranges, but there are many more areas which can be made to produce more deer by adopting more adequate protective measures.

This is particularly true of the piney woods of East Texas, the wooded areas of the coastal plains, and the brushlands of South Texas, where game law violations pertaining to deer are rampant the year around. Vigorous protective measures applied to such areas would produce an increased deer population, and help reduce some of the hunting pressure.

In the second instance, further

restoration activities are indicated. Though limited, there are yet to be exploited many thousands of acres of potential deer habitat where deer can be restored. Restocking in such areas, followed by protection until the herds are established, can make it possible to eventually spread the number of hunters over a greater area of hunting range, and thus aid in alleviating hunting pressure.

In the third instance, there is the javelina, which can absorb some of the hunting pressure. Sportsmen travel the world over to bag a boar, and yet they ignore our truly wild pig, which is a worthy quarry, makes an attractive trophy, and is delectable eating. Advertising the quality of the javelina as a game animal will divert some of the pressure on the white-tailed deer. Likewise, open seasons on antlerless deer where indicated will divert hunting pressure.



Pete the Python, Fort Worth's now famous snake, is somewhat of a piker in the estimation of Howard Ardwayne and Ed Henry, two Bay City hunters who recently combined their skills to kill a 12-foot alligator that weighed approximately 650 pounds. John Nation, Bay City News, says the 'gator was found on the Pierce Estate Ranch and brought to town, where Pete Kogutt snapped several pictures of the fresh-water giant.—(Photo courtesy Bay City News)

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# Congress Goes On Record for Conservation

The National Wildlife Federation, nation-wide "watchdog" of the outdoorsman, has released a statement commending the recently adjourned 83rd Congress for its "distinguished record in legislating for soil conservation and watershed management."

Except in the soils and water field, the Federation said, there was little new conservation legislation of major importance. Conservationists, however, were cheered by such "negative victories" as rejection of the so-called "stockmen's grazing bill," defeat of the Ellsworth timberland exchange bill, and failure of a drive for authorization of a reclamation dam in Dinosaur National Monument.

Conservation Director Charles H. Callison of the Federation listed these four acts of the recent Congress in aid of soil and water conservation:

(1) Appropriations for a "pilot plant" program designed to demonstrate on small watersheds throughout the country the effectiveness of good land management and up-stream water control.

(2) The Hope-Aiken Watershed Protection and Flood Prevention Act, which provides federal money and technical assistance to states and local agencies in small watershed management programs.

(3) Amendment of a 1937 law to authorize federal loans to farmers for "soil and water conserving facilities."

(4) An income tax change permitting farmers to deduct the cost of terraces, contour farming, ponds and other conservation improvements, up to 25 per cent of their gross income.

Conservationists have long contended that the historic flood-control programs of the Federal government were going at the problem wrong-end-to. They treated the symptoms rather than the cause, spending vast sums for big dams and levees on the lower streams, trying to contain the overflows after the floods became a fact. They ignored the uplands—the farms, rangelands and forests—where floods commence and where man's treatment of the land has increased water runoff and soil erosion.

The 83rd Congress started the process of straightening out this flood

control business. It appropriated \$5 million last year to the Soil Conservation Service for a "pilot plant" program designed to show on small watersheds throughout the country how proper land management and runoff control can prevent floods, as well as save soil and increase farm production. It voted \$7,250,000 this year to continue the work during fiscal year 1955. Then it passed the Hope-Aiken Watershed Protection and Flood Prevention Act, now designated as Public Law 566, 83rd Congress. The Hope-Aiken law provides for federal cooperation with the states and local districts in small-watershed conservation programs. Federal participation will include both funds and technical services.

Before the Hope-Aiken bill was passed, the sponsors had to beat off and compromise some Senate Committee amendments, inspired by Army Engineer thinking, that would have seriously hamstrung the program. As finally signed by the President, the Act appears to be workable law.

The "stockmen's bill," which conservation organizations opposed, was abandoned in Committee. Sponsored by a group of livestock operators who hold grazing permits on the public lands, this measure would have given the ranchers a right to sell their privileges or bequeath them to heirs and would have weakened the authority of the U. S. Forest Service to prevent overgrazing.

A more moderate grazing bill which had the support of some conservation groups also failed to pass.

The Ellsworth bill, designed to transfer blocks of National Forest land to private ownership in exchange for lands taken by the government for reservoir projects, was defeated in the House by a vote of 226 to 161.

The controversial Echo Park Dam proposal was contained in a bill to authorize the billion-dollar-plus Upper Colorado Basin Storage Project, a far-flung reclamation program that includes several other dams and irrigation projects. Conservationists opposed Echo Park as an invasion of the national park system. It would have built flood scenic canyons in the heart of Dinosaur National Monument in Colorado and Utah. The bill failed to come to a vote in either the House or Senate.

In his summary Callison listed several "defeats" for conservationists. One was failure of a bill to set aside 10 per cent of National Forest receipts for public recreation areas and wildlife improvements. Another was legislation needed to correct the 1872 mining laws and eliminate spurious mining claims in the National Forests. Still another, Callison said, was the failure of Congress to extend the Water Pollution Control Act beyond next year or to appropriate enough money for its programs. The Federation predicted these matters will come before the next Congress.

## Worth Repeating

"We fish with nylon leaders, with fiberglass rods, with reels made of new alloys. Scientific research has given us new powder for our cartridges and new . . . metals insure rifle barrels with life-long accuracy. We live in a wonderful age of scientific advancement and we take full advantage of it in the fields of medicine and industry.

"Isn't it odd then, that the modern-day sportsman sometimes expects game management to ride in a buggy and yet keep up with present heavy demands on fish and game? . . . They regard scientific research in wildlife matters as a stupid innovation.

"If the public wishes to maintain its wildlife resources, it must be as ready to give serious thought to findings of a wildlife biologist as it is to accept the products of the industrial worker."

Lester Bagley, Commissioner  
Wyoming Game and Fish Commission



## Quail Management on Pastures

• Continued from page 26

fertilization is recommended. At least one spot should be planted in every potential covey territory that lacks cover.

Where excessive grazing has damaged native cover, such as blackberry patches, plum thickets and vine tangles, a little barbwire management will often do a quick job of renovation. Also, an application of fertilizer will speed recovery.

**Food Management:** Saving native weeds from mowing is one of the first steps in managing food in pastures. Goatweed and partridge pea are two of the most important species widely lost to mowing in Texas. A mile strip 16 feet wide contains only two acres, so asking a pasture man to leave weeds around the edges is not unreasonable.

In fact, farming for weeds is reasonable and practicable if quail are desired. On most land formerly cultivated, fallow disking produces an abundance of legumes, spurge, and other groups of quail foods. This is cheaper than any planting, where it works. Burning, properly controlled, increases the same food plants more cheaply, but benefits are more temporary.

Planting quail foods should be

easy to promote if it helps the cows, and this is true of the annual lespedezas, common, Kobe, and Korean. Where these are adapted, I know of nothing better. Moderate grazing will permit at least a four-inch stubble in the fall, and this is sufficient to reseed the pasture and provide winter quail food. Heavier grazing will eliminate the benefits to quail and make costly reseeding necessary.

Other crop plantings that benefit quail are the winter vetches and peas when they are permitted to seed.

Bicolor lespedeza has a place in the program as an intensive method of developing food. But it is too costly and not quite good enough to be a one-shot remedy. In Texas, we have found that most people who planted bicolor patches had opportunities to do other things that would have fed more quail at less cost.

Less intensive work for quail, widely applied, offers more promise. The landowner with interest in quail also can adjust his land use and gain quail with little or no cost.

Where pastures are only partially improved and annual lespedeza is seeded, the pattern of the improvements is important. Scattered spots of improved pasture throughout a range make the lespedeza seed available to more coveys and help spread the cows over the whole pasture. Any extra cost resulting from not having the improvements in a single block next to the barn is more than covered by the increased use of free grass.

Likewise, grazed firebreaks can be used to advantage. Fertilized and seeded strips about 20 feet wide serve as firebreaks about nine months a year. Grazing keeps them cropped close enough that fire can cross only during exceptionally dry periods. Quail use these strips for feeding, dusting, and as edges through areas of heavy rough.

Hay meadows of Kobe lespedeza are good or bad, depending on the amount of seed produced by the stubble after the hay is cut. To

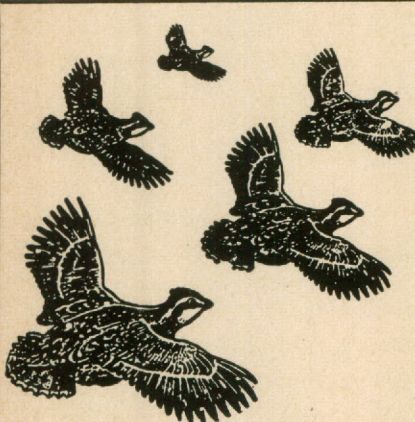
benefit quail, the hay should be cut by the end of July, with the mower blade set about four inches high. Then, with normal rainfall, a good crop is produced, providing the field is not grazed before November. As far as the hay crop is concerned, better quality hay results from the early cutting.

Where cross fencing makes deferred grazing possible, as in hay meadows, early fall protection from grazing not only helps the quail, but also is good business for the livestock operator. The free seed crop of lespedeza is gained, and new growth of clover is allowed to get a start.

This clover provides winter greenstuff for quail, which is important where the native flora lacks species which are green in winter. Fortunately, clover is almost always planted in improved pastures, so this is rarely a quail management problem.

Artificial feeders for quail are said to be adapted to use in pastures to increase quail. While our experience in Texas has confirmed that wild quail will feed at them, we think their value is in providing temporary food supplements. For year-around use, their cost is greater than that of developing native foods, and their artificial character creates some problems.

The real problem, however, is to create desire among landowners for such advice.




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## Let's Get Acquainted

• Continued from page 23

acanthus with 2,4-D to determine the best dosage to use on project.

Development, Sheldon Reservoir, Management Area: Building dwelling for resident biologist, office, laboratory and service building; improvement of existing levee and spillway; construction of breaker levees and channels; vegetative planting to prevent erosion on west boundary levee, erection of signs and boundary markers; drilling well for headquarters; and appraisal of development of the Sheldon Reservoir for future fishery development.

Typical of problems encountered by the aquatic biologist is one which occurred not too long ago at the new Buckner Hatchery, located below Possum Kingdom. The hatchery yearly encountered difficulty in spawning black bass. Research revealed that sudden drops in temperature were not killing the embryos, but that fungus spores were attacking the eggs and destroying most of the hatch. A proper fungicide that would kill the fungus and not affect the eggs was then searched for. It was found that a five-tenth part per million solution of copper sulphate would permit an excellent hatch.

The story of the rearing of fish in hatcheries differs from most fish stories in that hatchery production deals mainly in terms of small fish. The finding of suitable conditions for a hatchery is not easy. Several factors which contribute to an ideal site are a rare occurrence, and the Department feels itself fortunate when a place is found where every requirement is met.

But nature must supply its part, too. There must be an abundant supply of water of the right kind, adequate area for level ground, or a suitable slope for drainage. Where these conditions are present, the location should be reasonably safe from overflow, and conveniently located in a section of the state where fish are needed and cannot be supplied by existing hatcheries.

The entire Inland Fishery program is one of doing the job a little better than it has been done before. The practice of removing young bass



fry from brood ponds, for example, has been greatly simplified. The laborious process of using dip nets from which many of the fry escaped has been replaced by installation of special fry traps at each hatchery. When the fry begin to move about, they travel in schools along the edges of the ponds, where they are caught in the nets. From the traps they are lifted out with dip nets and sized in separate ponds.

Fish culture in Texas has come a long way from the days when the first carp were distributed in wagons. While this was fortunate for the caretaker, for the roads over which they traveled were rough enough to permit adequate aeration, trucks these days are supplied with tanks equipped with motor-driven agitators which aerate the water and permit faster distribution with a smaller loss of cargo.

Credit for many of these improvements necessarily must go to a well-

trained staff of aquatic biologists which constitutes only a part of the work of the Texas Game and Fish Commission. In next month's installment, we shall learn about the work of still another division of the department—that of the Wildlife Restoration Division—its functions and its personnel.

### Fishing Film

The serenity of the Alaskan sunset, in stark contrast to the savage strike of King Salmon, are being depicted in a new movie sponsored by the Scott-Atwater Manufacturing Company.

Entitled, "Portage to Alaska," the film is available to interested groups without charge. Information about the film may be obtained from the Scott-Atwater Co., Minneapolis 13, Minn.

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# Characteristics of Lead Vital to Bullets

In the manufacture of sporting ammunition, the well-known element, lead, has played a highly important part for many, many years. Hunters of big game, upland game, and waterfowl have frequently asked why this metal is so peculiarly and ideally adaptable to the manufacture of hunting cartridges and shotgun shells.

The answer to this question has a number of interesting facets which give it a technical flavor. According to Dr. C. S. Cummings, Remington Arms Company's supervisor of physics and ballistics research, there are at least four important factors in the requirements for a satisfactory long-range bullet or projectile material.

Says Dr. Cummings: "The raw materials must be plentiful; they must be relatively inexpensive; they must be easily fabricated; and the bullet must have as high a density as possible.

"The first three requirements are more or less obvious. There are many materials which are plentiful and inexpensive; there are considerably fewer which, at the same time, are easily formed by such inexpensive methods as casting, swaging, or dropping from towers. It is, however, the addition of the fourth condition, high density, that makes lead an out-

standing contender in the field.

"To understand this, we must understand the reason why a long-range bullet, or bullet material, should have a high density. This is a necessary consequence of the requirements that such a bullet must first have stability in flight; second, have as flat a trajectory and as high a remaining velocity as possible; third, have as high a striking energy as possible; and fourth, not be inconveniently large.

"By 'stability' we mean that the bullet must resist the tendency to tumble or 'keyhole.' It is for this reason that a bullet is given spin. There is a mathematical formula that tells us what the minimum rate of spin must be for a bullet of given size, shape and density if it is to be stable in flight. This formula tells us that if two bullets are of the same size and shape, but one is less dense than the other, the lighter bullet must have a faster spin than the heavy bullet.

"Obviously, if the required minimum rate of spin becomes too high, the twist of the rifling may be so steep that the bullet would strip in passing down the barrel.

"The same formula tells us that it is more advantageous to have a short bullet than a long bullet of the same weight and diameter if we do not want the rate of spin to be too high. This condition of maximum stability with minimum spin is thus seen to be met most easily

when our bullet is made of a material with a high density.

"A flat trajectory is a very desirable feature for a bullet since this reduces the precision with which the shooter must guess an unknown range. This condition is best met by a bullet whose initial velocity is high and which, also, has the ability to retain its velocity well in the face of air resistance.

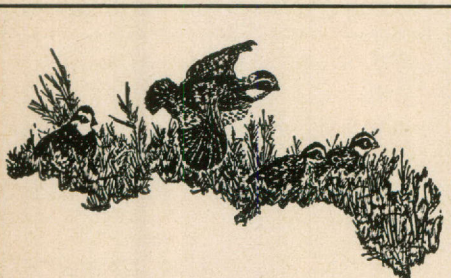
"The ability of a bullet to overcome this resistance is measured by a quantity called the 'ballistic coefficient.' The higher the value of this quantity, the less velocity will be lost by a bullet in a given distance. For bullets of the same size and shape, the value of the ballistic coefficient is directly proportionate to the weight, hence to the density. The higher the density, other things being equal, the more efficient is the bullet.

"The shooter also wants, and properly so, high striking energy. The striking energy depends upon the weight of the bullet and the velocity at the target. Obviously, the high density bullet weighs more.

"The matter of size is more or less obvious. If, to obtain a bullet of desired weight, it were necessary to give it a very large diameter, or excessive length, the problems of gun design would be made more difficult, as would the problem of carrying a large number of rounds.

"The list of elements with densities higher than lead is an interesting one. Here it is: gold, iridium, mercury, osmium, palladium, rhodium, ruthenium, tantalum, thallium, thorium, tungsten and uranium. All of these are extremely rare, very difficult to work, very expensive or physically unsuited.

"Insofar as bullets and shot are concerned, lead is one element which seems to be truly 'born for the job.'"



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## Things You May Not Know

Meadow larks, formerly hunted as game birds, are not larks at all, but actually belong to the blackbird family.

A rattlesnake has, on the average, two (not one) rattles for each year of its age.

The nighthawk perches lengthwise on a tree limb, not crosswise as most birds do.

Certain wasps are considered the first paper manufacturers. They build their nests out of paper-like substances which they make themselves.

The deer family is enormously diversified. It ranges from the massive moose, which is six feet tall and weighs about 1,400 pounds, to the pudu, which weighs up to 24 pounds and stands only 13½ inches at the shoulder.

The wild boar has its practical uses. Its strong, stiff bristles end up in paint brushes.

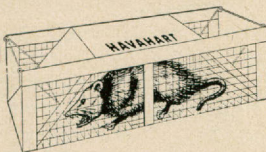
Giraffes, because of their poorly developed voices, communicate with each other mainly by switching their tails.

The nickname of the scarlet tanager is "Robin with a sore throat" because of its hoarse caroling.

Because of its consumption of rodents, the Barn Owl is considered one of the most valuable birds of prey. It is seldom seen in the daytime.

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# FREE QUAIL BOOK ISSUED

A new booklet about Texas bobwhite quail is now available without charge from the Game and Fish Commission, Walton State Building, Austin 14, Texas.

It is a non-technical but scientifically sound volume covering the complete life story of the bobwhite in Texas with a resume of research

and management practices of past and present. The cover is in full color from a painting by Orville O. Rice. It is generously illustrated throughout and contains 51 pages.

It reveals in detail how quail live, feed, reproduce, and carry on the various life processes. As the title, "Quail Management in East Texas," implies, the accent is on that part of the state, but the principles apply in general to other sections of Texas. The author is Daniel W. Lay, veteran wildlife technician and quail specialist of the Game and Fish Commission.

It is particularly timely as the quail season gets underway, and landowners or sportsmen who have a constructive interest in the improvement of quail hunting and quail habitat will find this free booklet particularly valuable.

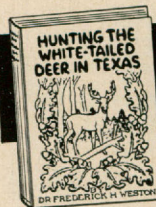
## Publisher Announces Teaching Aid Books

The second edition of the popular "Bibliography of Free and Inexpensive Materials for Teaching Conservation and Resource-use" by Muriel Beuschlein has been published by the Conservation Project of the National Association of Biology Teachers. Copies are available at ten cents with 20% discount on orders of 100 or more, from the project leader, Dr. Richard L. Weaver, P. O. Box 2073, Ann Arbor, Michigan.

The revised bibliography will be Chapter XII in the "Handbook on Teaching Conservation and Resource-use" which was prepared by the Conservation Project Committee and which will be released early in 1955. The Handbook contains descriptions of over one hundred school projects or programs in conservation and resource-use from thirty states. It will assist teachers in planning for classroom and club programs; schoolground and community projects; for elementary and secondary children. Advance orders can be placed with the Project Leader. It will cost \$4.00 per copy, with a 20% discount to teachers and schools. Proceeds from the sale of the Handbook will be used to locate additional descriptions for use in later editions of the Handbook.

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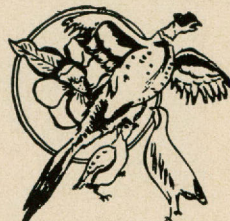


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## PHEASANT—BOB WHITE QUAIL—CHUKAR PARTRIDGE

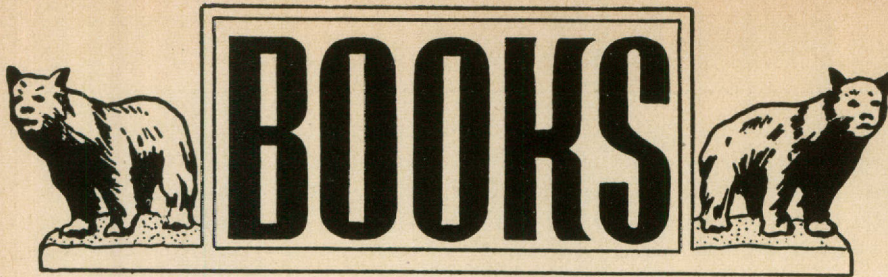
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# BOOKS

**WILDLIFE IN ALASKA** by A. Starker Leopold and F. Fraser Darling. 129 pages with charts, line drawings and photographic illustrations. Published 1953 by The Ronald Press Company, New York, New York. \$2.75.

A short, but comprehensive analysis of Alaskan wildlife, the observations of Leopold and Darling were published in 1953 after the completion of extensive journeys in Alaskan territory.

The authors note that Alaska, one of the new countries of the world and the last frontier of the United States, is not at a point of development where policies of wildlife conservation must be "conceived, considered and put in hand before really severe or irreversible devastation takes place."

They point out that most Alaskan wilderness offers little hope for "development in the ordinary Chamber of Commerce sense of the word," but that it offers a wonderful opportunity for use in the study of wildlife, and for recreation.

They suggest broad governmental programs for the conservation of habitat and animals, including the establishment of wilderness areas in the unspoiled sections of the territory.

Included in the study are concise but complete histories of some of the pri-

mary big-game animals of Alaska. There are also distribution charts on the caribou, the moose, and the reindeer.

**THE FLOOD CONTROL CONTRO-**  
**VERSY** by Luna B. Leopold and Thomas Maddock, Jr. 278 pages with charts, tables and line illustrations. Published 1954 by The Ronald Press Company, New York, New York. \$5.00.

A lucid evaluation of the big dam-little dam and land management aspects of the flood control program, this book, as authored by Leopold and Maddock, analyzes the possibilities and limitations in the building of dams, and in land management.

It demonstrates, by the use of charts and experimental data, that flooding can never be completely eliminated in a river system.

The authors deal effectively with the question of the upstream (small dam and land management) and downstream (large dam) program for flood control, as advocated by the Department of Agriculture and the Corps of Engineers, respectively. Their critical review of the programs advocated by these two agencies points inevitably to the realization that they are complementary, but not interchangeable.

The upstream program is necessary

to deal with local areas, and the downstream program to provide protection from major floods.

Leopold and Maddock present cogent arguments for redefining the Federal interest in flood control, and for the reapportionment of costs and benefits on a more logical basis for the groups who need flood protection, and for the nation.

Authored by hydraulic engineers with years of experience in the water resource field, this book should help to disperse many of the fallacious ideas about the flood control controversy. It is an unbiased presentation of facts that is well worth reading.

**FLORIDA BIRD LIFE** by Alexander Sprunt, Jr. 527 pages illustrated with maps, photographs and 40 color plates. Published 1954 by Coward-McCann, Inc., New York, N. Y., and the National Audubon Society with the cooperation of the U. S. Fish and Wildlife Service and the Florida Game and Fresh Water Fish Commission. \$12.50.

Always popular birdwise, Florida has attracted more people in the last quarter century than ever before. And since interest in birds in general has grown all over the country in recent years, many of its visitors have been bird students, who have accumulated much additional information since the publication of Arthur H. Howell's "Florida Bird Life" in 1932.

This volume might be said to be a combination revision-rewrite of the earlier book. As a special feature of the new edition, Mr. Sprunt gives the translations of scientific names and includes in his introductory material a description of the physical features of Florida. Fourteen new color plates have been added, so that the book now boasts 40 full color plates, in addition to maps and photographs.

An index and bibliography make this volume a basic reference for any field observer.

**PHEASANT BREEDING AND CARE** by Jean Delacour. 98 pages with photographic illustrations. Published 1953 by All-Pets Books, Inc., Fond du Lac, Wis. \$3.00.

There are probably as many methods of raising pheasants as there are breeders. But in his work on the care and breeding of ornamental pheasants, the author strives to lead the amateur step by step, from the egg to the adult bird. In so doing, he has incorporated his work with the earlier one of Charles F. Denley.

The latter's book on "Ornamental Pheasants" has proved so timeless that many of his chapters have been held intact. But the scope of the book itself has been enlarged to cover all aspects of game pheasant propagation.

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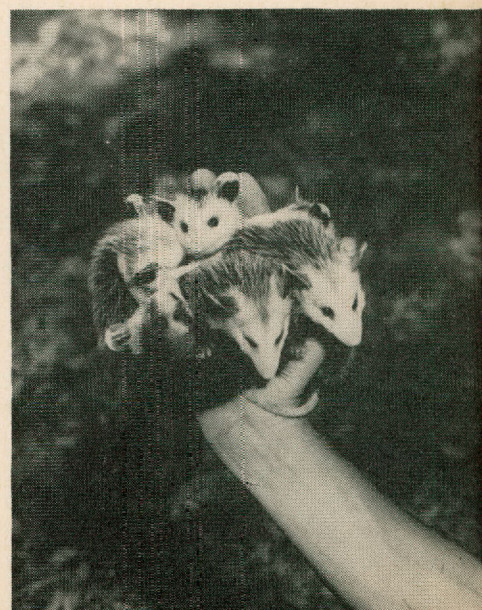
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## Young At Heart

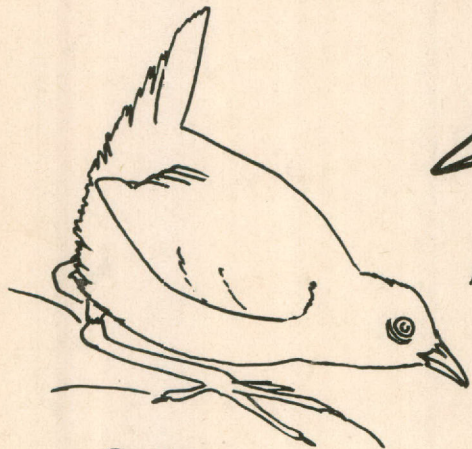
*When separated from their mother, these young opossums proved more than willing to stage a special acrobatic performance for Clyde Graham, staff photographer.*



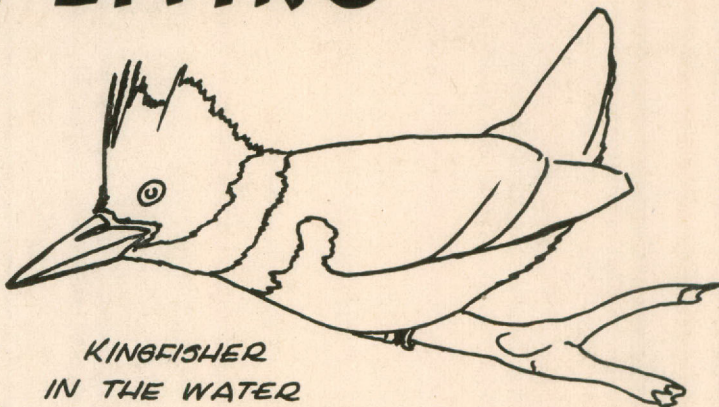


# ADAPTATION EARNS A LIVING

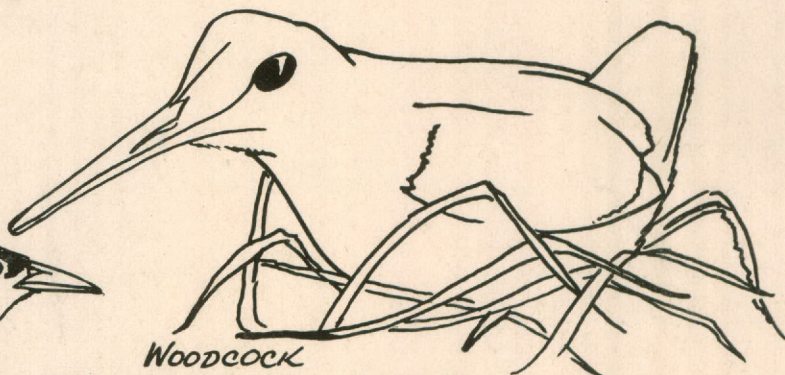
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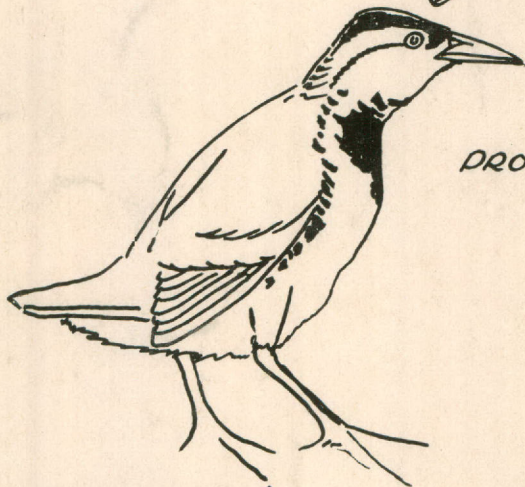
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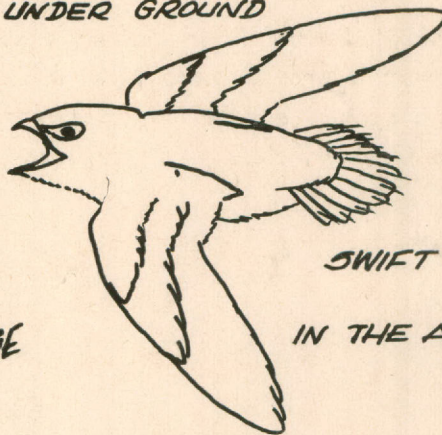
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