

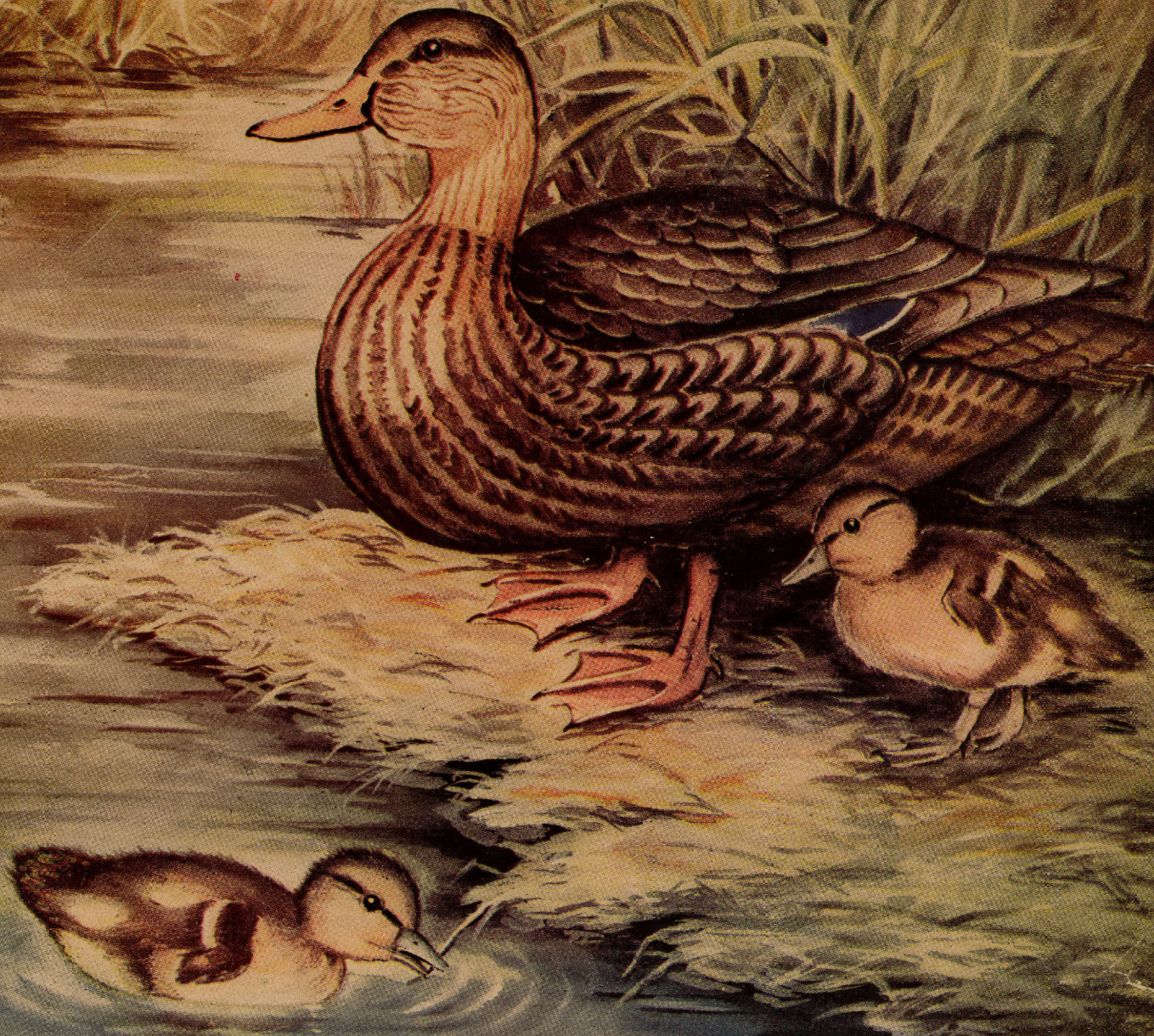
TEN
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TEXAS *Game AND Fish*

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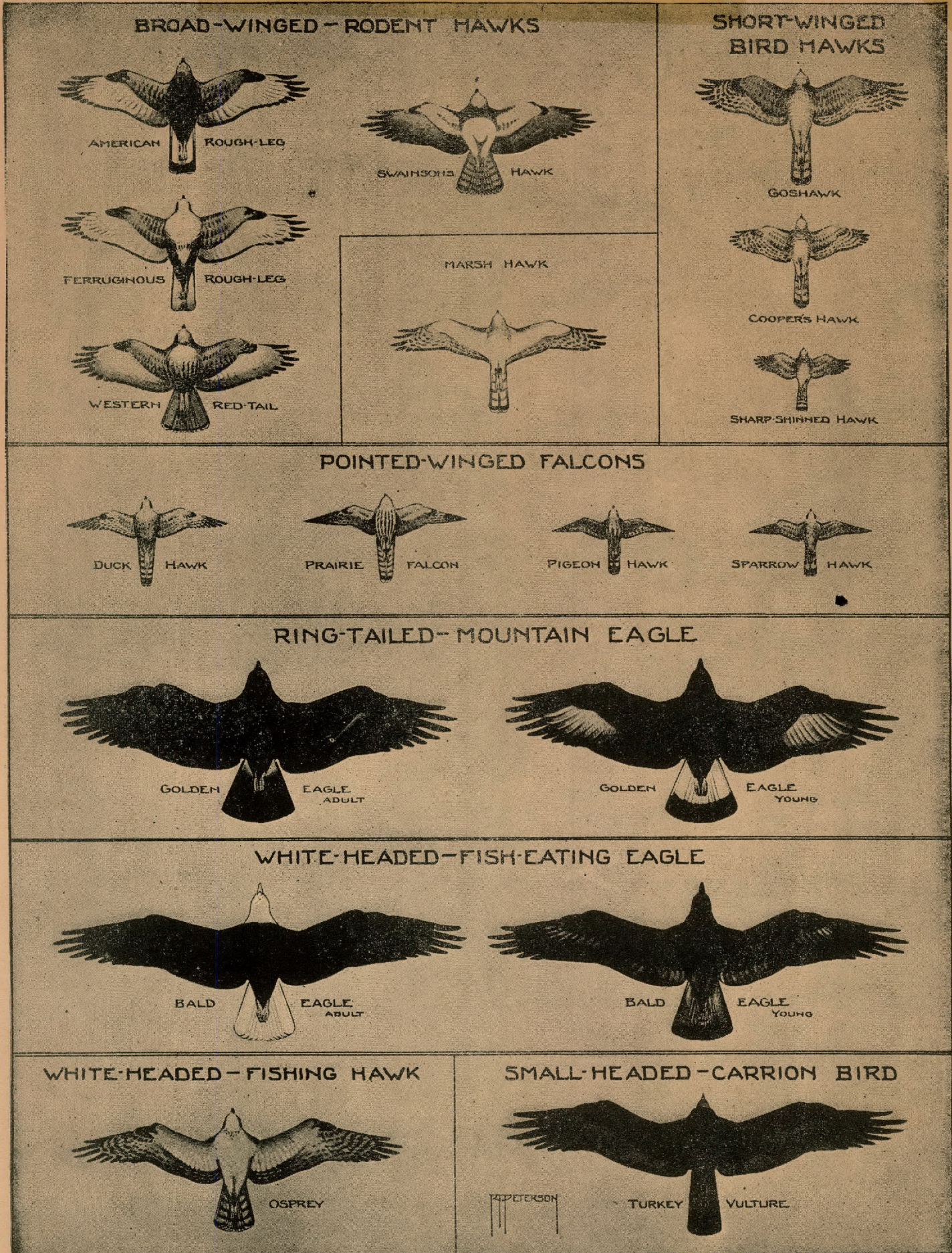
Singletary

Special County Fishing Regulations

WESTERN HAWKS—What They Look Like in the Air

Pacific Coast East to the Great Plains

All Birds Drawn to Same Scale



Some of These Hawks are Among Our Most Useful Birds

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Vanishing Species of Wildlife in Texas

By Walter P. Taylor

*Leader Texas Cooperative Wildlife Research Unit**

TEXAS will face soon the loss of four important game species and one entire fauna. Two of the game species are mammals: the black bear and the bighorn sheep.

Black bear, formerly widespread over the entire State, has now been reduced to a remnant of its former numbers, located in the Davis Mountains of Jeff Davis County and the Chisos Mountains in Brewster County.

Texas bighorn, formerly found on a number of mountain ranges in the Trans-Pecos area, is represented by a handful of individuals, principally in the Sierra Diablo Mountains, Culberson County.

The expanding occupation of the ancestral range of these species by livestock has brought about their reduction in numbers. Neither species can compete under present conditions with sheep, goats, and cattle.

Two game birds are the Attwater prairie chicken and the lesser prairie chicken. The Attwater prairie chicken, formerly found from southwestern Louisiana all the way around the coastal prairie section of Texas nearly to the Point Isabel region, has now been reduced so that less than 1 per cent of its former population remains. Only 7 per cent of its ancestral range is now occupied at any season by Attwater prairie chickens. The factors inimical to this bird are the expansion of agricultural operations—principally rice production—the livestock industry, and the burning, plowing, and overgrazing which accompany these various activities. Formerly overhunting played an important part.

Up to a comparatively recent date the lesser prairie chicken occupied a considerable area in the Panhandle section and the Rolling Plains country. It is being gradually pinched out by the expansion of agriculture and the lack of sympathetic appreciation of it on the part of some landowners and operators.

In extreme South Texas, an entire fauna is in jeopardy. Here such subtropical birds and mammals as the white-winged dove, chachalaca, red-billed pigeon, white-fronted dove, Derby fly-catcher, and Eyra cat are threatened with eradication as a result of the continuing removal of the brushy habitat which constitutes their home.

No half-way measures will suffice to preserve these birds and mammals. If they are saved, they will be "bought for a price." The Game, Fish and Oyster Commission, U. S. Fish and Wildlife Service, or any other agency, are powerless

(Continued on Page 7)

State of Texas



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The Foxhunters' Fraternity

By Andrew Potter

*"Then through the dell his horn resounds,
From vain pursuit to call the hounds;
Back limpid, with slow and crippled pace,
The weary leaders of the chase."*

A GREAT MANY of us belong to secret fraternal societies and ever and anon we meet a brother in some unexpected way and through these lodge connections we soon become fast friends. Now, so far as I know, there is no organization among foxhunters with pass words, grips and signs. They do not meet behind closed doors, where to come in their "charmed circle," one must give "three distinct raps on the outer door," followed by the question "Who comes there?" Hunters meet out under the broad canopy of God's heaven where the crickets chirp, the bats sweep, the owls hoot, the stars sparkle and the pale moon sheds its soft mellow light.

BUT DON'T MISUNDERSTAND me—there is a "Foxhunters' Fraternity." You are not formally voted in. No one asks "Where were you first made a hunter?" Nor are you supposed to answer "In my heart." But just the same no one can ever be a real fox hunter until he is first one in his heart, and when he is he will instinctively recognize another hunter, for there will be an intuitive understanding of each other and they will know the language of the fraternity.

FOX HUNTERS HAVE a language all their own. If you have ever been invited into the mysteries of the chase and been instructed by some "grand old man," who has carried the same horn for forty years fastened with a string over his shoulder—a horn with which he has "tooted in" numberless hounds—you will begin to understand the deep current of joy that flows into the heart of a real hunter when his beloved dogs are packing on the scent of a Red Ranger.

HUNTING IS IN the blood. You instinctively recognize another hunter and understand his language. He only has to tell one exploit of his dogs before you know him for what he is—a fake or the real thing. A real hunter in his conversation will use the right terminology. He may tell his story big enough, but not too big. A real hunter will keep on the main line in his discussion of dogs. He will stick to fox hunting in his conversation and not turn aside to expatiate on his marvelous success as a coon hunter, ad infinitum.

IT IS EASY to recognize a real hunter. He will be at the starting place at the appointed hour. He will show up on the hunting ground and not send any good alibi why he did not come. He is not afraid of rain. It takes more than a cloud the size of a man's hand to keep him at home. He will be there in spite of the fact that the sun went down behind a cloud bank. Lightning in the west does not scare him away from the chase. A real hunter likes to eat cheese and crackers at midnight, washed down with black coffee. He always

has matches in his pocket and can build a fire with wet wood at 2 a. m.

A REAL HUNTER is patient. He will sit on an "old quilt" for hours waiting for the dogs to "strike." He is hard to discourage. Like a tuberculosis patient, he is hopeful to the end. When someone suggests that it looks like an "off night," a real hunter comes to the rescue and strengthens the brotherhood's fading faith by a realistic recital of a race he had upon one occasion after hunting all night and not finding a fox. "We had give up," he says, "and blowed in the dogs and

"The Monkey's Viewpoint"

Three monkeys sat in a cocanut tree,
Discussing things as they're said to be.
Said one to the others, "Now listen,
you two,
There's a certain rumor that can't be true;
That man descended from our noble race;
The very idea is a disgrace.

No Monkey ever deserted his wife,
Starved her babies and ruined her life.
And you've never known a mother monk
To leave her babies with others to bunk.
Or pass them on from one to another,
Till they scarcely know who is their mother.

And another thing you'll never see;
A monk build a fence 'round a cocoanut tree
And let the cocoanuts go to waste,
Forbidding all other monks a taste;
Why if I'd put a fence around the tree,
Starvation would force you to steal from me!

Here's another thing a monk won't do—
Go out at night and get on a stew,
Or use a gun or club or knife
To take some other monkey's life.
Yes, man descended, the ornery cuss,
But, brother, he didn't descend from us!
—Richmond Rotor in Ohio Conservation Bulletin.

started back to camp when they jumped him like a rabbit and we had the finest daylight race I ever heard." This or a similar experience a real hunter will recite in order to cheer the faint-hearted and give hope to the faltering brothers.

THERE IS ANOTHER way to recognize a real hunter. He knows when to talk and when to stop talking. He will sit on the ground for hours pulling his old cob pipe, talking about the approaching election, regaling the virtues of his favorite candidate for county sheriff; he will talk about the revival meeting; the latest murder case; even a bit of neighborhood gossip—though he is no scandal monger—

but all this is done for the entertainment of his fellow hunters and to keep up the spirits of the camp followers.

BUT HE KNOWS when to quit talking. When a dog "opens" in whom he has unbounded confidence and he believes a real strike has been made, he says, "There's where a fox has put his foot, old Ben will soon have company," and that is the last word you will hear from him unless you ask a direct question. If the camp followers keep "giving mouth" in competition with the dogs, his face will take on a look of unspeakable disgust, or, perhaps the look of a threatening storm cloud, and if it's not too cold to leave the fire, he will take his blanket and move on out of the range of their conversation. Otherwise he will suffer in silence, wishing all the while that the "wind-jamming" camp followers would be struck dumb temporarily.

I REPEAT A real hunter is hard to discourage. If he stays out all night and fails to get a race, he goes home cheered with the thought there will be another chance and he confidently believes the next time his luck will change. He is not a quitter. His motto is "If at first you don't succeed, try, try again." A real hunter is a born optimist in all matters pertaining to the chase. When his dogs "make a bother," he has the utmost confidence in their ability to straighten it out and continue the race. He will never admit the race is finished until a certain favorite dog comes in.

ALL THESE AND a multitude of other characteristics mark a real hunter from the would-be or faker. Every man who has hunting in his blood quickly recognizes a real hunter when he meets him.

I HAVE HUNTING in the blood. I believe I know his type of thinking and feeling. Living where there are no fox, I am denied the pleasure of the chase but when the warm spring days come and the soft south wind blows and the nights are still and clear, I begin to count the hours to vacation time, when I hope to have better running than the year before. I hunt only one month of the year, and, as every real hunter knows, that is not sufficient for one who has it in the blood. You can no more hear the hounds enough in one month to satisfy you for a year than you can eat enough in one month to satisfy you for a year.

I KNOW LOTS of old-time hunters—men who followed the hounds because they loved the sport. Their names rarely ever appear in print, but they are part of the fox hunters' brotherhood who help to keep alive the greatest sport on earth. I love the chase. For me there is no sort of recreation which affords relaxation like riding to the hounds. From such a diversion I can return to my work invigorated in body, more alert in mind, and more bouyant in spirit.

*"Home is the sailor, home from the sea,
And the hunter home from the hills."*

SO! YOU BELIEVE IT, EH?

By Phil Goodrum

Director, Division of Wildlife Restoration

TO MOST PERSONS the word snake is synonymous with the devil. Likewise all snakes are poisonous. These misconceptions have led to undue persecution of the entire snake clan. It is true that there are some dangerously poisonous snakes and these should be treated with the utmost respect—they will see to it that they are so treated. Truth is we have more useful snakes than we have harmful ones and it is on this point that outdoorsmen should acquaint themselves so they may give the supposed devil his dues. Practically 100% of all tales told about snakes are those concerning poisonous, or otherwise "bad," kinds whether they are or not. It frequently happens that most snakes we encounter in the woods and fields are not poisonous, in spite of weird tales to the contrary.

NOW WHAT GOOD are snakes anyway? Practically all snakes in this country feed on rodents (rats, mice, etc.), insects, frogs, and worms, and are therefore largely friendly to man. The bull snake is one of these. Even the most venomous kinds like the rattlesnake are rat eaters. It so happens that the rattlesnake and other poisonous kinds are equipped with fangs and poison sacs and their injections are poisonous to humans as well as rodents. We therefore prefer to eliminate them instead of their eliminating us.

YOU MAY OR may not know that there are only four types of venomous snakes in the United States, rattlesnakes, cottonmouth moccasins, copperheads, and coral snakes. Among these types there are twenty different poisonous species mostly rattlesnakes. There are five times as many different species of non-poisonous snakes as there are venomous species. The first three kinds mentioned above are called the pit vipers, so called because they have a small opening or pit between the eye and the nostril. It is commonly believed that poisonous snakes can be identified by the shape of the head; if the head is arrow-shaped, it is poisonous, if it is elongated, it is not venomous. Nothing is further from the truth for there are many kinds of snakes in the world that are highly poisonous with elongated heads. Our own coral snake is a good example. This snake is highly venomous and its venom acts upon the nerve centers and is deadly poisonous. Fortunately this snake seldom bites. It is nocturnal in habits. During the day it hides under leaves, stones, loose earth, and like places where it can get away from the light. It does not strike like the rattlesnake but simply reaches out and takes hold when stepped upon or handled.

BECAUSE OF OUR dread and dislike of snakes in general, many misconceptions are accepted as facts. Several years ago, while on a camping trip in western Texas in a rattlesnake infested country, I was

advised to lay a hair rope around my cot to keep the snakes away. I was told that rattlesnakes would not crawl over such a rope. Now I have questioned several snake experts on this point and they all were of the opinion that hair rope or no hair rope, it would be more or less accidental if a rattlesnake should visit my cot. Rattlesnakes do not go around looking for some human to bite. They use their poison for a more utilitarian purpose. They capture their prey by poisoning them. Rattlesnake venom is poisonous only when it enters the blood stream. A snake may eat with perfect safety a rat that it has poisoned. As a matter of fact a person could also eat it without ill effects if no fresh, open wounds were in the mouth or intestinal tract. Venom of the rattlesnake, as well as that of a great many other poisonous snakes including the copperhead, and cottonmouth moccasin, breaks down the red corpuscles producing death if the dose is large enough.

IT IS ALLEGED that the cottonmouth moccasin will swallow its young when danger threatens. Several persons have told me that they have seen from 10 to 20

young snakes make for the mother's open mouth upon their approach. I almost reached the point where I believed the story myself until I read a statement from one of the world's greatest authorities on snakes, Raymond L. Ditmars. Speaking of all kinds of snakes that allegedly swallow young, he said: "During thirty years of observation of serpents under all sorts of conditions in which they are found, I have watched them in areas in temperate zones, on the deserts, and in the tropics, and have carried the story in mind. To these observations are added the studies of captive specimens. Thus the author (Ditmars) has had every opportunity to verify the occurrence. I have never noted any hint of it."

YOUNG SNAKES PAY very little attention to their mother after birth. If they are found on the same log or other place it is because it is a favored place and not because they want to be with the mother for protection. This tale has, in part, arisen from the fact that female snakes have been killed with many young unborn snakes in them. Some snakes lay eggs while others give birth to the young just as mammals do. Furthermore this story may also have arisen from the fact that some snakes are semi-cannibalistic, eating their own young or the young of others. The bull snake and blacksnake are of this kind. Some persons have said they heard the mother snake hiss or call to the little ones. This is not good "snakeology." Snakes are of a low order mentally and do not in any way care for the young after birth.

OF ALL THE preposterous tales I have ever heard about snakes is the one that was told to me by an old negro. He told me, with much enthusiasm, that he had seen a bull snake milk a cow. I questioned him at length as to just how the snake did it. He explained that he heard something like a bull bellowing down in his pasture and went to see about it for he did not have a bull. On his way to the "bull" he saw his cow going in the same direction. By the time he had arrived on the scene the bull snake had wound itself around the cow's leg and was sucking for dear life. He said the snake was bellowing to attract the cow. I don't believe it, do you?

ANOTHER RATHER COMMON tale is the one about the hoop snake. The hoop snake, so the tale goes, rolls itself into a hoop on the crest of a hill and then rolls down the hill to pick up momentum. At the appropriate instant it unfolds and sticks its tail into some tree thereupon killing it with its poison!

There are over 4,000 varieties of rice grown.

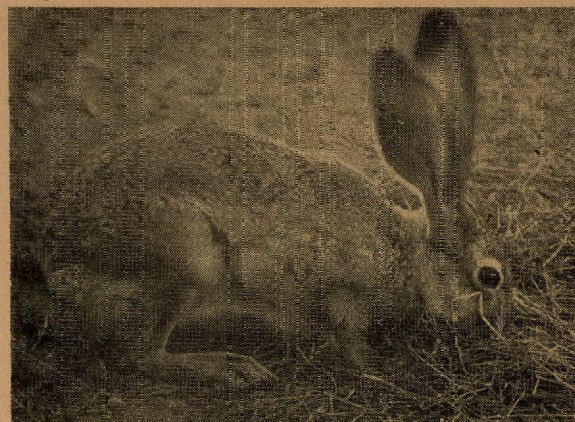
Fox Hunts Win Club Members

Sportsmen's clubs in areas where foxes are abundant may well follow the example of the Warren Field and Stream Club of Pennsylvania, which is successfully combining predator control with membership recruiting through regular organized weekend fox hunts. According to State Game Officials, these hunts have helped raise the club's membership from 49 members at the start to over 600 at the present time. Thirty-two joined following a hunt recently.

The method is simple: A survey of the local territory is made and an area at least half a mile long, containing a heavy concentration of fresh fox tracks, is selected as the scene of activities. Hunters are placed around the area on three sides, close enough together so that a fox cannot escape without passing within easy shotgun range. Other hunters then line up and drive from the open end inward. As the drivers march past, the watchers on the inside fall in to tighten the line.

Following the hunt, club members participating—who often exceed a hundred—climax the day with coffee and hot dogs prepared over a charcoal fire. The hunters have plenty of fun, the club gains members and, as the Game Officials say, "The boys are helping solve an acute predator problem."

FUR ANIMALS Of TEXAS



Jackrabbit competes with livestock for range forage but the pelt is of slight value as "hatters stock."

Beaver

DESCRIPTION: Largest of North American rodents; body robust; weight averages about 40 pounds; total length including tail about 40 inches; tail about 15 inches long and 4 inches broad, flat and scaly; ears short; hind feet webbed; color generally brown but showing considerable variation from yellowish brown to black; fur composed of long, hard hairs and short, soft under-fur.

DISTRIBUTION IN TEXAS: Formerly found practically all over the state where trees and permanent water were present, but probably most abundant along the Pecos River, the Rio Grande, the Edwards Plateau, and in east Texas. Following many decades of exploitation, reduced to relics or remnants in the Panhandle, the Llano River, and nearby drainages in the Edwards Plateau region, and the Rio Grande. In recent years beavers have been trapped from the Llano drainage and certain Panhandle streams and released at other points in the state by the Game, Fish and Oyster Commission and the Texas Cooperative Wildlife Research Unit. About 150 beavers have been so distributed in the past three years. As a result of this restocking and some measure of protection, it may be anticipated that beavers will again become a valuable fur animal in suitable localities over the state.

FOOD: Bark and twigs of deciduous trees and in summer or open seasons of the year, miscellaneous herbaceous matter. Favorite trees are aspen, cottonwoods, and willows. Other vegetable matter such as roots and stems of aquatic plants and grass is also eaten, probably more proportionally than is ordinarily thought. The beaver may occasionally damage cultivated crops or orchards.

HAUNTS AND HABITS: The beaver is largely confined to ponds and streams in wooded areas. In large rivers it generally makes its home in dens that it digs in the banks. At other places it may either excavate a burrow or construct a house of sticks and mud. The entrances to either are always under water.

The beaver is the engineer among the mammals. Stories of its dams and tree-felling activities are familiar to everyone. The dams—built of sticks, stones, and mud—are built across small streams apparently to create the deep water that seems to be essential to the existence of the beaver. Dams that have been in use for a number

of years may attain considerable size; sometimes reaching several hundred feet in length and six or seven feet in height. Some of these large dams are estimated to contain upwards of 200 tons of material. Possibly even more remarkable than its dams are the canals that the beaver excavates to transport logs and other material by water to its lodge.

Because of the peculiar structure of the tail of the beaver, many theories have been advanced as to its uses and stories have been told, for example, of its use as a trowel or for carrying mud. Most authorities now agree that about its only uses are for swimming, as a prop while sitting up cutting trees, or for slapping the surface of the water as an alarm signal.

The trees felled by the beaver generally average from three to eight inches in diameter, but in exceptional cases trees up to twenty inches or even more may be cut. Contrary to popular belief, the beaver does not control the direction in which the tree will fall.

The beaver is believed to mate for life, the male remaining associated with the rest of the family throughout the year except during the summer when the young are small. Colonies of beaver may be composed of one or several families. The usually two to five young are born in April or May and remain with the parents for at least a year. They are weaned at about six weeks of age. The beaver does not breed until three years of age.

The beaver may be abroad at any hour of the twenty-four, but is most active between sunset and sunrise, especially in regions where it is apt to be molested by man or other enemies. The adult beaver is immune from attack by any except the larger carnivores such as the wolf, the otter, or the bear.

ECONOMIC IMPORTANCE: The beaver is sometimes subject to considerable criticism because of its cutting of trees and flooding of forest or farm lands. As a general rule, however, the trees cut by the beaver are of little commercial value and the conservation of water caused by its ponds may offset the damage caused by flooding. The generally useful or harmless habits of the beaver plus its fur value make it a most welcome addition to the animal life of most regions.

The pelt of the beaver is one of the most highly prized of American furs, its soft dense underfur being perhaps the chief reason for this. Much of the early explora-

tion of North America was inspired by the beaver as trappers pushed inland in search of new hunting grounds. In frontier days beaver pelts were a standard for barter or trade.

Due to its reduction by overtrapping, comparatively few beaver have been taken in Texas in recent years. In fact, in all but a few counties in extreme western Texas the beaver is protected by law at all times. Wise management, however, may bring it back to its proper place among the fur resources of the State.

Jackrabbit

DESCRIPTION: Body rather slender; legs and ears very long; upper parts brownish grey; under parts lighter to white; upper surface of tail black. Distinguished from the cottontail rabbit by its longer ears and legs, larger size, greyer coloring, and black upper surface of tail.

DISTRIBUTION IN TEXAS: Common all over Texas except the extreme eastern and northeastern part of the state. It is apparently extending its range eastward.

FOOD: Leaves, grass, bark, almost any edible vegetation. The jackrabbit sometimes does serious damage to cultivated crops and range grasses.

HAUNTS AND HABITS: The jackrabbit is primarily an animal of the open prairies, sagebrush country, and deserts of the West. It prefers open ground vegetation and seems to increase with a thinning of vegetation such as is caused by overgrazing. The jackrabbit has increased to such an extent in some regions that it is a menace to crops and livestock forage. Among the possible causes for this increase are the previously mentioned thinning of ground vegetation; the destruction of the jackrabbits' natural enemies by man; and the additional food furnished by cultivated crops.

Unlike the cottontail, the jackrabbit apparently builds no nest as a rule and also unlike the cottontail, its young are born fully furred and able to run about. The young are born nearly throughout the year and there are one to four in each litter. There may be two or even more litters per year. There is no association of male and female except during the mating period. The jackrabbit shows considerable fluctuation in numbers from year to year. In the northern portions of its range it is distinct-

ly cyclic; but in southern latitudes this cyclic habit is less easy to make out.

The fame of the jackrabbit as a runner is widespread and well deserved. It can outdistance any of its four-footed natural enemies in a fair race but is rather quickly overtaken by the greyhound. Coyotes, wolves, and foxes prey on the jackrabbit regularly but in capturing it they depend more on stealth and trickery than speed. Other enemies include large hawks and owls.

The jackrabbit is most active in the early morning, late afternoon, and at night.

ECONOMIC IMPORTANCE: The greatest economic importance of the jackrabbit lies in its destruction of livestock forage. The actual quantity of such forage consumed by jackrabbits is considerable; it is estimated that 148 jackrabbits consume as much forage as one cow and 30 as much as one sheep. (Vorhies and Taylor, 1933). Probably the greatest rabbit damage to range, however, takes place in unusually dry years or during the winter. At such times the rabbit's destruction of the little remaining green forage—frequently the bases of perennial grasses—represents a serious reduction in forage potentialities. This condition is partially offset by the fact that at such times rabbits resort to an increased extent to such succulent plants as cactus that are of no value as food for livestock. Poison, rabbit drives, and community hunts have been used as jackrabbit control measures with some temporary success.

Although not commonly considered as a fur-bearer, the jackrabbit may be of considerable value for its fur in regions of great abundance where large numbers can be obtained economically, as by rabbit drives. The flesh of the jackrabbit is not as good as that of the cottontail but it is usually quite palatable when properly prepared. The pelt is cased and sold by the pound as "hatters" and used in the manufacture of felt.

Other Texas Fur Animals

Besides those already discussed, which represent all of the important fur-bearers in Texas, there are several other animals in the state, the pelts of which are or have been sold for fur. These include the wolf, cougar or panther, jaguarundi, red fox, swift fox, and weasel.

Of these the red fox is probably the only one of any potential economic importance in the state. This animal is not a native of Texas but has been introduced and seems to have become established in a few small sections of the state. Its habits are similar to those of the grey fox, from which it is easily distinguished by its color. The fur of the red fox brings a considerably better price than that of the grey and the former is a much better game animal for running with dogs. Most of the red foxes introduced into the state were brought in by fox hunters seeking to establish them for hunting.

Tree squirrels in Texas have very thin fur in comparison with the tree squirrels of the North which are of considerable importance in the fur trade. However, it is possible that their pelts, which are now wasted in great numbers by the hunters who take them for their flesh, may have some value in the future. Their tails could be used in "camel's hair" brushes but so far as we know this industry has not become established in Texas.

Locked in a battle of death, these two bucks, one a ten-pointer and the other a nine-pointer, were found on Charlie Cade's ranch and game preserve about six miles from Caldwell. Photo and cut from the Caldwell News.



Vanishing Species of Wildlife in Texas

(Continued from Page 3)

to save them except as a widespread insistent public demand makes this possible.

Money will have to be appropriated for extensive preserves in order to provide a sufficient amount of land to permit the survival of these species.

If these native Texas species are lost, the State will be infinitely poorer. In the rush, bustle, and preoccupation of wartime these important conservation problems are likely to be overlooked. Bombed buildings in our big cities can be rebuilt, but wildlife species once exterminated cannot be restored.

**Fish and Wildlife Service, United States Department of the Interior; Agricultural and Mechanical College of Texas (research, education, extension); the Texas Game, Fish and Oyster Commission; and the American Wildlife Institute, cooperating.*

Hunted on Wrong Day

It happened in Iowa: A group of Council Bluffs sportsmen were hunting pheasants near a rural church. Several birds flushed wild and lit in the brushy churchyard. The congregation was gathering for morning worship, so the hunters requested permission to hunt the birds. The pastor put the matter up to the trustees, who held an extemporaneous meeting on the church steps. Permission was finally granted. The hunters moved forward in a skirmish line before the eyes of the interested congregation. There was a roar of wings, a fusillade of shots, and the birds just went away—every one of them—and so did a red-faced group of shotgun toters, followed by a chorus of impious chuckles.

The ordinary barn rat is the most prolific mammal. Considering the average reproduction rate, and ignoring any deaths, the progeny from one pair of Norway or brown rats could exceed 350,000,000 in three years. Talking about rodents, the lemmings, a species of small rodents resembling field mice, which inhabit the Arctic regions, migrate in great swarms, damaging crops and overcoming all obstacles in their march to the sea.

Hitch-Hiking Deer

A Minnesota motorist was driving through St. Croix State Park, when a large doe leaped in front of his car, then jumped ahead as it saw the car bear down. It was "riding with the punch" when the car struck, and the momentum kept the animal sitting on the front right fender until the startled motorist reduced his speed. The animal retained its seat for nearly a quarter of a mile. Then it jumped off without a limp, flirted its tail in a "thank you" gesture and disappeared into the brush.

Ants are able to drag objects which weigh many times their own weight. Roy Chapman Andrews watched an ant dragging a dead grasshopper. After weighing the bodies of both, he found that the ant was dragging a load sixty times his own weight. An Australian ant supported in its jaw a pair of gloves which were more than 1,100 times its own weight.

The antelope has horns made of hair. The outer covering is made of closely growing, hardened hair, covering a core of bony cartilage. This shell is shed, just as the animal's coat, annually.

Green-Winged Teal

(*Nettion carolinense*)

Other Names

Northern teal, green-wing, mud teal, winter teal, common teal.

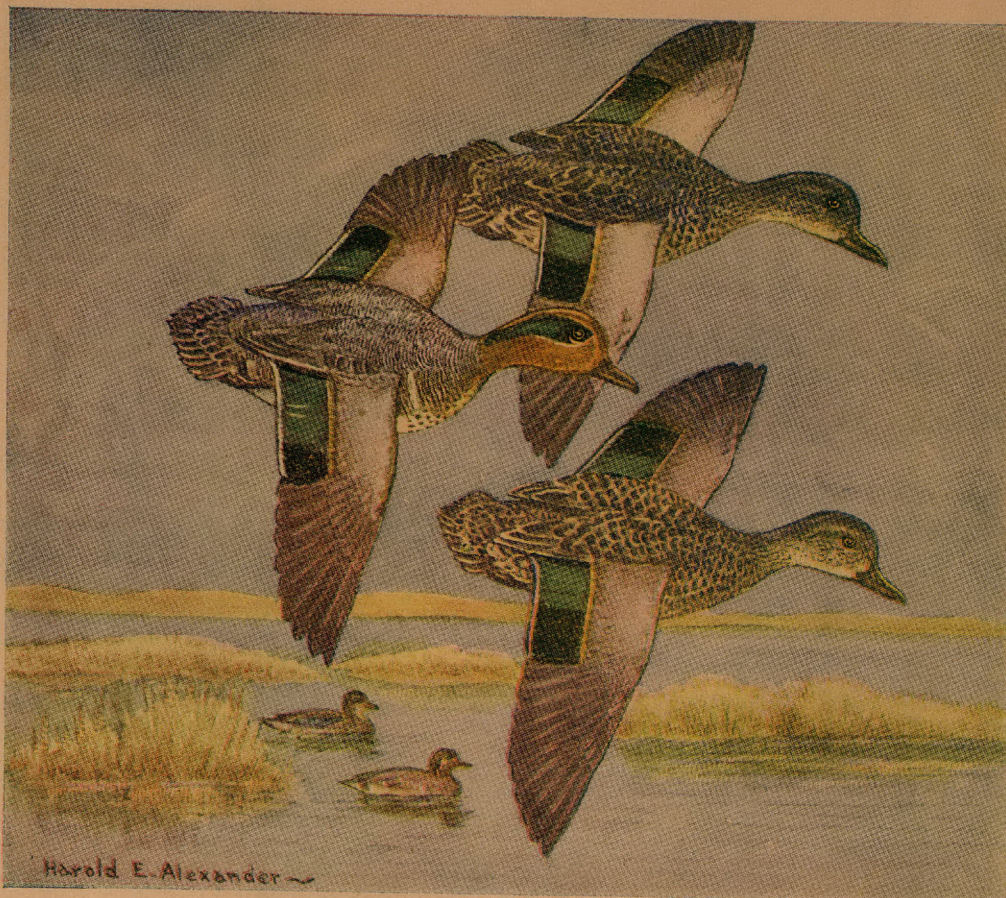
DISTRIBUTION AND MIGRATION:

The green-winged teal has an extensive breeding range, extending from western Alaska, across the Mackenzie River region, east to Hudson's Bay, south to the north central states, and west to northern California. They winter north to southern British Columbia, the north central United States from central Montana to Kentucky, throughout the southeastern United States to central America. This teal uses all four flyways, being particularly abundant on the Mississippi route. Some of the birds that nest in the interior migrate across to the east coast and travel the Atlantic flyway. It is also found throughout the southwest, and the Gulf region.

HABITS: The green-winged teal migrates north earlier than the blue-winged in the spring, and stays longer in the fall. This bird is found almost entirely on fresh water, staying on small rivers, creeks, ditches, and wet-weather pools. It feeds both by "tilting" in shallow water and on mud flats, a-foot, obtaining sedges, pondweeds, grasses, berries, grain, and aquatic insects, worms, and crustacea. The teal is largely a vegetarian, 90 per cent of its food consisting of vegetable matter.

FIELD IDENTIFICATION: The extremely small size, brown bodies with white bellies, brown wings, green speculum, and flight manner identifies them in the air. Green-wing teal are considered by many to be the swiftest of all ducks. They fly in very close formation twisting, turning, and wheeling in perfect unison, and are often found in very large flocks. Feeding in shallow water, they "tip-up" for food and often go out onto bars and flats to rest and feed. On the water, the small dark bill, generally dark coloration, and small size are key characters. When jumping from the water, they rise high before leveling off.

The male has a dark, reddish head with green patches from in front of the eye to the nape of the neck, dark bill, gray back, barred with black, reddish breast with black spots, brown wings, green speculum, and white underparts, which serve to differentiate him. The female has a light brown head, whitish throat, and neck streaked with brown, brown back mottled with gray, spotted yellowish breast, and white belly. The immature is like the adult female, but is more rusty colored, and in the young



Male

Immature

Female (below)

males the red-brown head is gradually but quickly acquired. Transition to adult feathering is complete by mid-winter.

STATUS: Since this duck has a large, more northerly breeding range, it has not suffered so great a decline in numbers due to drought and agricultural activities as have so many species with more limited

ranges. However, it has decreased along with other species in the past 25 years, but has held its own as well as any. In 1940 and 1941, reports showed an increase for this duck. Although hard to hit because of its speedy flight, the green-wing teal is curious and therefore will decoy readily, even returning after being shot at.

Letters to the Editor

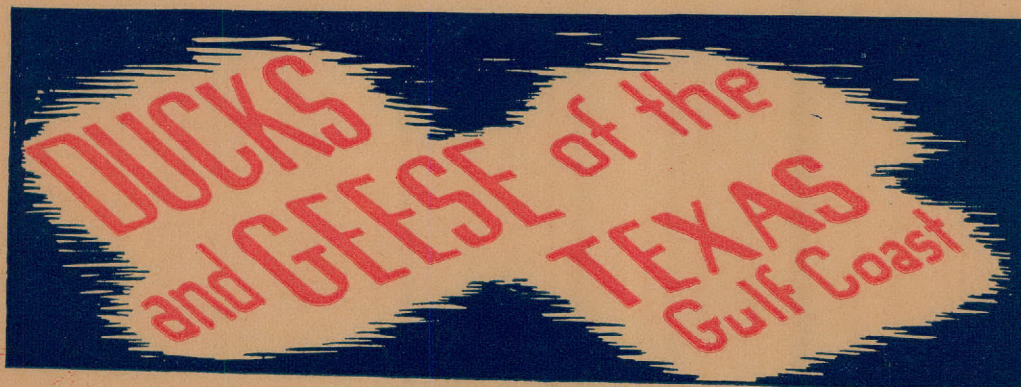
Editor,
Texas Game and Fish.
Sir:

Your editorial concerning live decoys in the February issue of "Texas Game and Fish" presented very well one side of the live decoy question, but the wrong side. True, a greater percentage of sportsmen felt that the restrictions made in former years as to duck hunting were justified. A true sportsman is a conservationist. In 1932 he took it on the chin. He has since bought his duck stamp year after year, sometimes, without even

planning a hunt. He has contributed in every way possible to efforts being made to increase waterfowl. And now with a plentiful supply of waterfowl he wants to go back to his old hobby of raising and training live decoys, which is a sport in itself. A live decoy hunter never went at it to see how many ducks he could kill. There was more of a thrill in seeing his decoys work for him. Of course, there are some hunters who disregard all laws and go in for large numbers and boasting of how they have duped the game warden. No matter what the laws are that kind of hunter remains with us.

In the first place, what caused the decrease of waterfowl? It was not the live decoy hunter. It was drought, grass and brush fires, crows, jackfish and other predators. The failure of the Fish and Wildlife Service to recognize and remedy these causes may have had something to do with the decrease. Why not have the Fish and Wildlife Service see to it that waterfowl have sufficient breeding and feeding grounds and leave the law-making up to the people's elected representatives. Instead of a step backward, it seems like a step forward in Democracy.

FRED QUIST,
1909 South 5th St.,
Austin 22, Texas





ARMS AND AMMUNITION

Edited By A. S. JACKSON

THE INVENTION OF the choke-bored gun is credited to Fred Kimble. For many years shotgun makers had toyed with the idea of constricting the muzzle of the bore to force the pellets in the outside of the charge toward the center of the pattern so as to prevent the shot from scattering. This had been tried many times without success, and gunmakers had given it up to the extent that all guns were true cylinder bore.

THIS STORY IS told by Fred Kimble, who made his own guns and was the outstanding shot of his time. He bored out the tube of a nine-gauge gun, leaving quite a constriction in the muzzle. After patterning the gun he found that it scattered the shot much more widely than the true cylinder bore, and being disgusted with it he took it back to his workshop to bore out the restriction in the muzzle and make it a true cylinder. In boring it out, his reaming tool did not retain its proper set, and without his knowledge a slight constriction of some 15 or 20 one-thousandths of an inch was left. Then on trying out the gun he was amazed to find that it shot a closer pattern than any gun he had ever fired. He was at a loss to know why this was true. He carefully re-checked all his work and finally came to the conclusion that it must have some connection with the fact that he had originally left the constriction in the muzzle and then bored it out. On re-checking the bore, he found that it was not exactly true and was constricted by a couple of one-hundredths of an inch. He was very excited and immediately built another barrel, leaving a constriction of 20 one-thousandths of an inch, gradually tapering in the last five or six inches. This gun also shot the same close pattern that hunters had been looking for for many years.

HE KEPT IT a secret for some time, but of course the art eventually became general knowledge of gunsmiths and led to our modern accurate chokeboring. The theory is this. The average muzzle velocity of shot in any gauge shotgun is approximately 1,300 feet a second, while the velocity of the gas on being released from pressure at the muzzle is nearly 4,000 feet per second. As the charge comes out of the muzzle of a true cylinder, the wad presenting the largest surface of resistance is blown forward through the then compact shot group, scattering it in all directions. The felt wad between the shot charge and the powder charge acts as a gas seal under pressure coming down

through the tube. In a chokebored gun the choking at the muzzle momentarily holds up the felt wad until the shot has cleared the muzzle by a sufficient distance so that the wad is not blown into the pattern.

THERE IS ANOTHER kind of chokeboring not used any more in modern guns called recess choking. In this gun the diameter of the bore just before reaching the muzzle is enlarged by some 20 or 25 one-thousandths of an inch for a space of five or six inches just inside the end of the barrel, but the extreme tip of the muzzle for the last inch or so retains its original dimension. In this type of boring the felt wad goes up through the tube, forming a gas seal until it reaches the larger dimension, where it no longer extends from one side of the tube to the other and allows the gas to escape around the wad and leave the muzzle ahead of the felt wad. This also prevents the gas from blowing the wad into the shot charge.

THE BORE OR gauge of a gun was originally determined in this way. If the barrel of the gun would just take a perfectly spherical lead ball of a size that ran 10 to the pound, it was known as 10-gauge. Or if that size ball ran 12 to the pound, it was known as a 12-gauge, etc. That was, of course, in the days before accurate micrometers were used. Now modern gunsmiths have cast perfectly spherical lead balls with a specific gravity of 11.352 and measured them. The decimal fractions in one-thousandths of an inch for the various gauges are as follows:

8 gauge835
10 gauge775
12 gauge729
16 gauge662
20 gauge615
28 gauge550

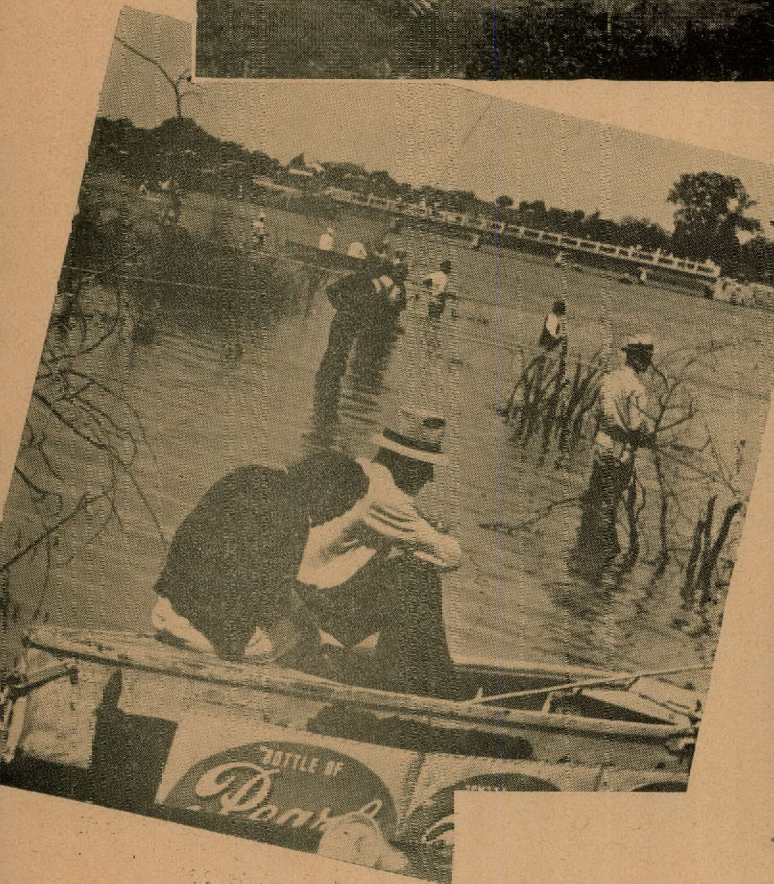
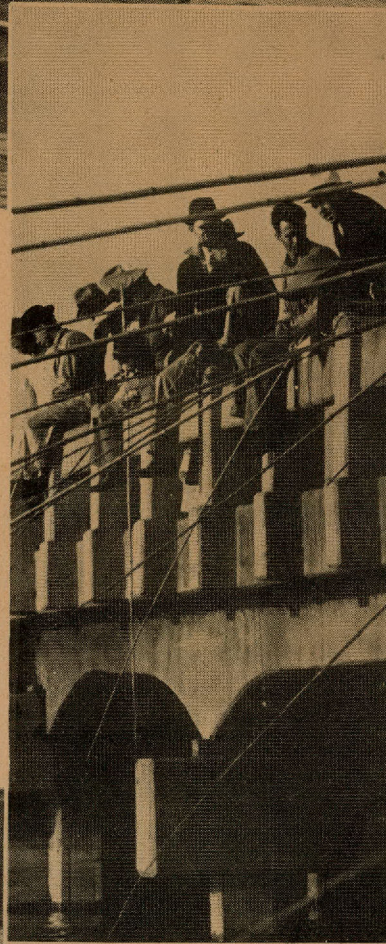
The "four-ten" coming after the days of the micrometer is not a 410-gauge but a .410 caliber, just as the 12-gauge gun would be a .729 caliber.

FOR MANY YEARS the hot stove league has argued the merits of various gauges of guns, and of course everyone is entitled to his own opinion. However, there is no more an all-around gun than there is an all-around golf club. We frequently hear the expression that a certain gun is a hard-shooting gun. Actually, it is as ridiculous to say that a certain gun is a hard-shooting gun as it is to say that a certain hammer is a hard-hitting hammer. This does not mean that certain guns will not shoot more even and better patterns than others, but

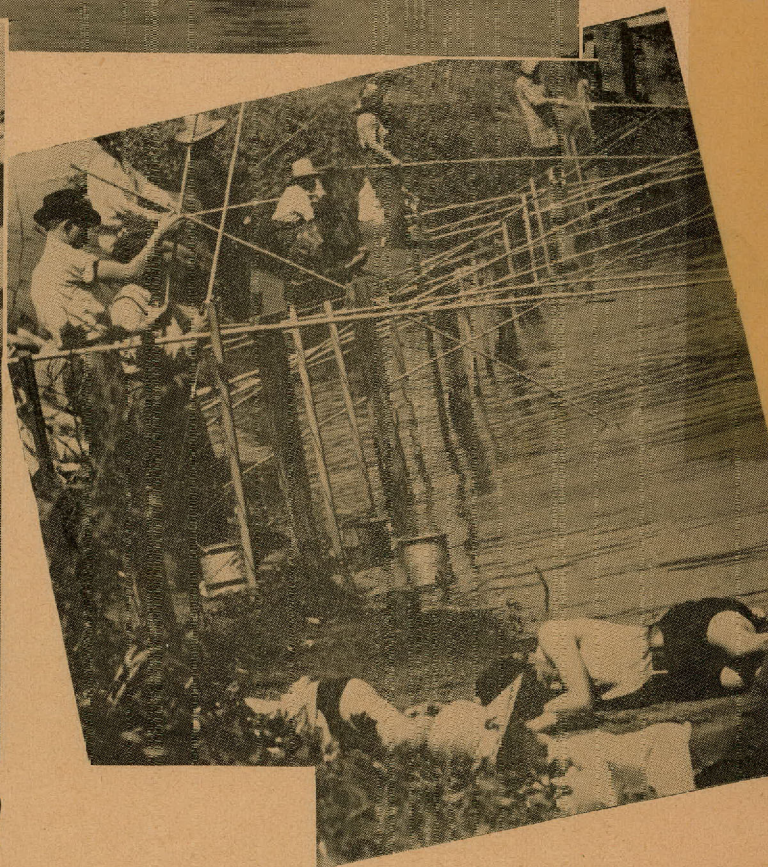
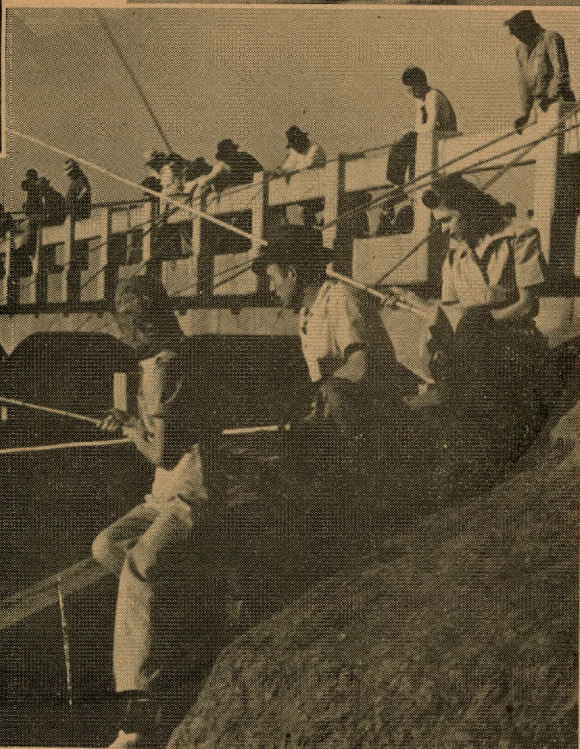
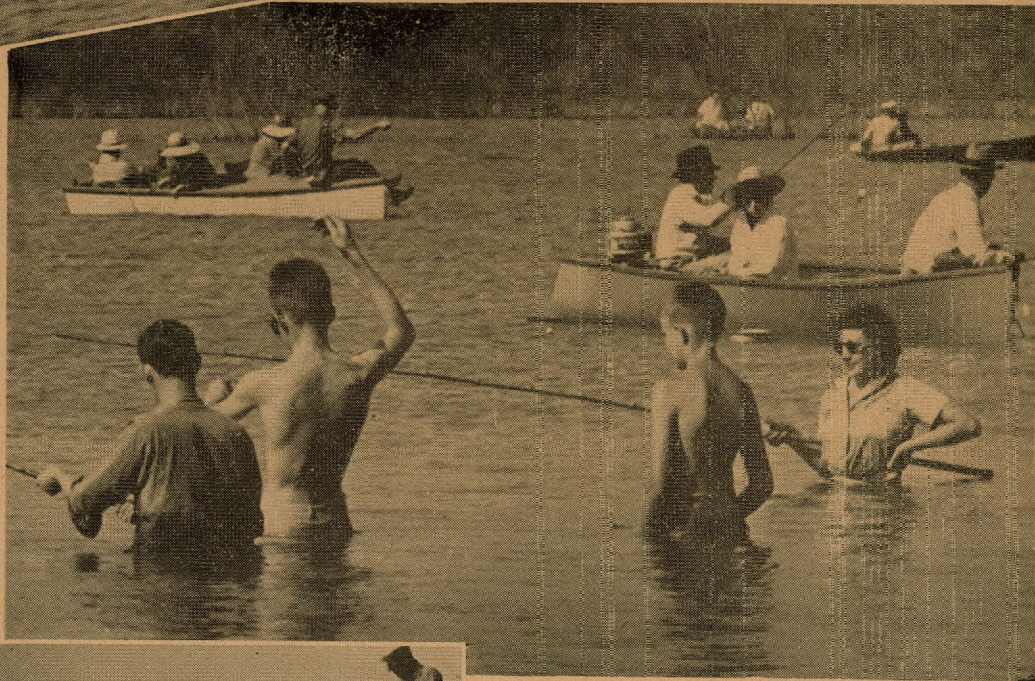
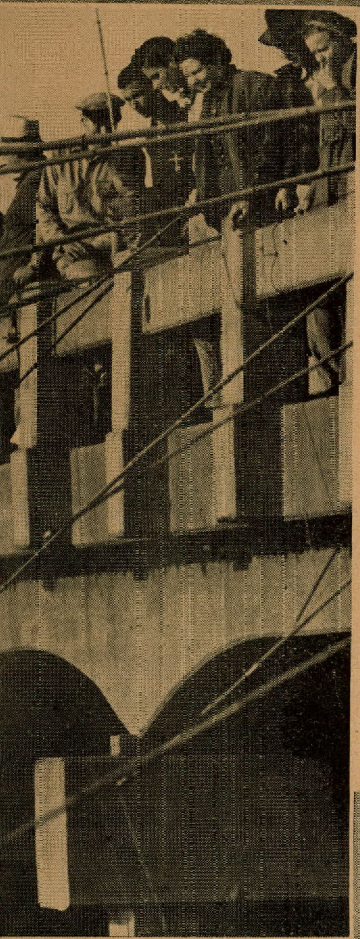
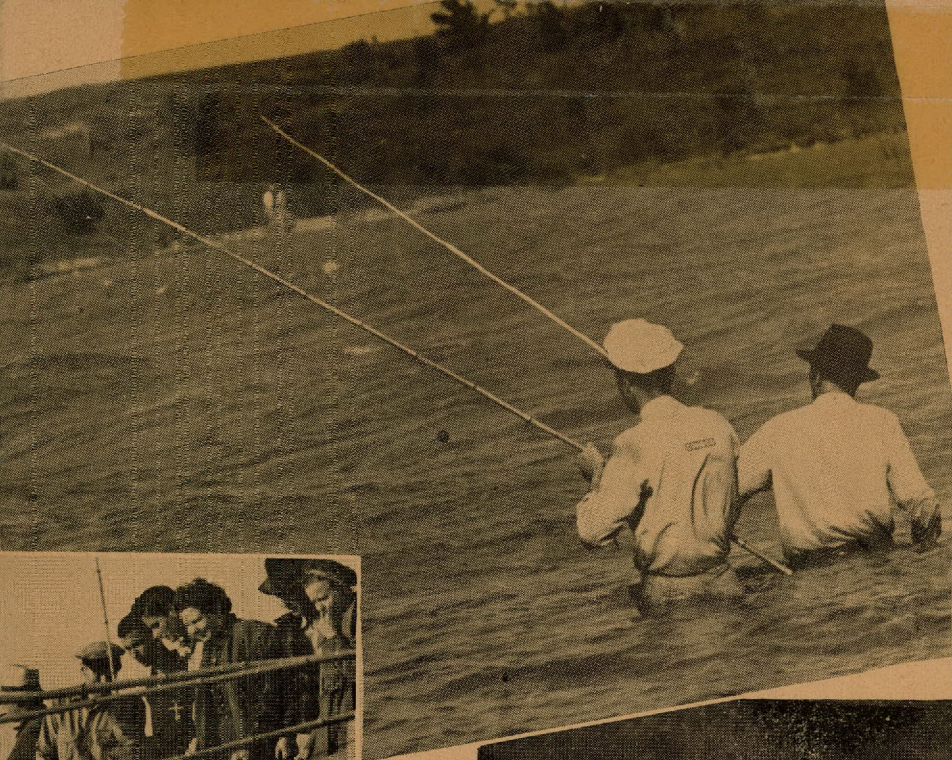
how hard a gun shoots providing it is in good conditions depends upon the load and not upon the gun. The thing that makes hard shooting is the velocity of the pellets of shot at the time of impact, and oddly enough the muzzle velocity of all guns from the 10-gauge to the 20-gauge is approximately the same, around 1,300 feet per second at the muzzle and falling off in proportion to the shot size fired, the larger shot maintaining its velocity better and the smaller shot size falling off more rapidly. In other words, if you shoot number six shots from an eight-gauge gun or from a 20-gauge, they will strike the target at 40 yards with the same hitting power. The big-gauge gun has a distinct advantage over the small bore because of the larger shot charge bringing a greater number of pellets into the pattern and therefore enabling it to handle a larger shot size than the small bore. Let us assume that the target is set up at 50 yards. We fire a charge of number four shot from a 20-gauge. Because of the small number of pellets, not enough of them reach the pattern at the same time to assure us that one or more pellets will hit a game bird, even though the aim is correct. The number four shot fired from a 10-gauge carries a sufficient number of pellets so that ordinarily the pattern is dense enough at 40 yards to assure us that one or more pellets will hit the bird at that distance. I am not arguing the advantage of a big bore gun over a small bore gun: I only maintain that at all ranges the large bore gun will always outshoot the small bore gun in their ability to kill game. This does not necessarily mean that the big gun is the best because the small bore gun does have many distinct advantages. Being lighter, it can be brought to bear upon the target much more quickly, and game can be brought down at 30 yards that would have gotten out to 40 yards in the additional time required to swing and point a heavier gun.

I HAVE OWNED and killed game with practically every bore from an eight-gauge to a .410, and I like them all. To me it seems a bit incongruous to see a little 125-pound man struggling through the field with a 10-pound 10-gauge, but it is just as much out of keeping to see a big 225-pound man out hunting with a .410. No gauge has any magic qualities; it simply represents a certain size hole in a metal tube through which a charge of shot is fired.

TO SHOOT A three-inch 12-gauge shell in a magnum gun merely gives you a 10-
(Continued on Page 12)



Texas Fishermen Escape from the



The Turmoil of a War Torn World

A Young Buck For an Apple

Mrs. Muir Waller of Nova Scotia, is one buck ahead because she reached for an apple instead of a gun—and the buck is alive, too. On the final day of the deer season, according to *Hunting and Fishing in Canada*, a young male deer strolled unconcernedly into her shooting camp, and approached her without fear. Not having the heart to shoot it, she produced an apple which the deer ate with relish. When she broke camp, the animal climbed into the car and curled up on the back seat. On arriving at her farm at McClure's Mills, the buck made itself at home and has remained there ever since. Mrs. Waller believes the deer to be a tame one that had wandered back to the woods.

Do Butterflies Hibernate?

Nearly everyone who is acquainted with the out-of-doors is familiar with the conspicuous cocoon and chrysalid stage in which many moths and butterflies spend the winter. The fact, however, that some butterflies overwinter as adults is not so well known. The best known example of hibernating adult butterflies are the angle wing butterflies which usually overwinter in hollow logs, under loose bark, in crevices and in old buildings. The mourning cloak butterfly, the red admiral and the tortoise butterflies are familiar representatives of this interesting group of insects. Sometimes they can be seen flying about on warm sunny days during the middle of the winter when they temporarily leave their hibernating quarters. Usually one finds only a few of them overwintering in one place although, in some cases, large numbers may be found living in the inner walls of a well sheltered hollow tree or other protected place. The appearance, in early spring, of butterflies with tattered wings suggests that probably many other kinds occasionally overwinter as adults. This would not be surprising as many other kinds of insects notably beetles, flies and true bugs, commonly hibernate in this stage.

Fox in Midwest Problem

Reports from midwestern states indicate the belief of farmers and sportsmen there that foxes and other predators are largely responsible for a shortage of rabbits and other small game. This follows reports to the same effect from several eastern states.

According to the *Chicago Daily News*, farmers and sportsmen throughout Illinois are organizing fox hunts—"not the kind in which the hunters wear red coats and bowler hats, but organized drives where the object is to kill as many foxes as possible." The paper reports that the fox has become a menace in many localities.

Certainly, wherever the fox is overabundant, the sportsmen's organization has an excellent opportunity to increase its membership and sustain interest in its activities, through organized fox hunts designed to reduce the numbers of these predators.

Language of Animals

By Ethel R. Admanson

EVERYONE who has heard a dog or a horse welcome its master with exclamations of joy, or a cat plaintively meowing for its food, ought to believe that animals can talk. Of course, by "talk" we do not mean a set form of words like our own. But those who have made a study of the ways of our "little brothers" are agreed that animals are able to make their ideas known not only to man but to one another.

In expressing their wants and feelings almost all the higher animals make use of gestures. The dog speaks with his eye and ear. The wagging of the tail is quite as expressive as the shake of a human hand. Shame and disgrace could not be better illustrated than by his hanging ears, downcast look, and tail depressed, as he slinks away under rebuke. In illustration of this gesture-language, the story is told of a dog who had formed a friendship with a kitten. One day while they were in the garden, the kitten decided that it would like to go into the house. Finding the door shut, it tried to call the attention of those inside by meowing under the window. When she did not succeed, her friend the dog picked her up gently in his mouth and held her up before the window, shaking her back and forth until she was finally seen by someone within. The kitten was admitted into the house; and ever afterward the dog employed the same sign when his kitten friend needed his help in this way.

The manager of a zoo came to the conclusion some time ago, that monkeys have a language and can express themselves in both sign and sound. He observed the sounds made by two apes; their gestures of affection, their quarrels, and felt sure that they were in communication. Placing the two monkeys in separate rooms where they could not see one another, he took a phonograph into the room where the male monkey was, and recorded the sounds he uttered on a cylinder. Then taking the record into the other room it was reproduced for his mate. She evinced great interest and anxiously looked the instrument over, thrusting her arms about it, and chattered excitedly. Then a record of her voice was made for the male monkey, and repeated for his benefit. At once Mr. Monkey became excited and vociferous. By repeating this experiment the animal trainer became absolutely convinced that the two monkeys understood the sounds thus produced and that they had a real meaning to them.

Many students of animal life believe that certain sounds made by fishes are for the purpose of expressing feelings, and have a definite meaning if we could understand them. There is little doubt that cats try to speak to their masters and mistresses. Many cats have warned human friends of fires that have broken out during the night. Birds give different bird-notes to express their feelings. The barnyard fowl crows with delight from the fence as the sun rises over the hilltops; gives evidence of anger in his tones when struggling with a fellow cock; or gently chuckles when talking with his lady love. The elephant has a voice like a clarion when communicating messages to far-off companions. But speaks softly when in the company of a herd of his fellows. The intelligence of the ant, the bee, and the spider is proverbial; and there is little doubt that these small creatures have their own means of making their desires and feelings known to one another.—Our Dumb Animals.

Arms and Ammunition

(Continued from Page 9)

gauge load in a 12-bore gun, or what was a 12-bore before it was bored out as a magnum. Isn't it more sensible to shoot a 10-gauge load in a 10-gauge gun than to build up your shot columns so that you are shooting a 10-gauge load in a 12-gauge gun? The reason for developing the 12-gauge magnum is because the 10-gauge load will kill birds at a greater range than the 12-gauge load. For instance, it is against the federal law to shoot a gun larger than 10-bore at migratory waterfowl. In order to circumvent this, the 10-gauge magnum was developed, and instead of boring the guns at 775 one-thousandths of an inch, they were bored out to 800 one-thousandths of an inch, which is approximately the diameter of the bore of the eight-gauge, and the shot charge was increased from about 1½ ounces

to 2 ounces. It is generally true that the higher you build up your shot column the poorer your pattern, and under the same conditions 1½ ounces of shot fired from a 10-gauge will make a better pattern than the same charge fired from a 12-gauge.

WELL, ALL THIS will never settle the argument of which is the best gauge gun, and after all as long as we are hunting for pleasure I think the best advice to anyone is to buy the type of gun and the size gauge that he likes best, and then he will get more enjoyment out of hunting with it, for after all, we are out after pleasure and not to prove any point.—Bruce F. Stiles in *Tow Conservationist*.

Roast skunk is a favorite food among certain Canadian Indian tribes, and many white men have declared it better than chicken.

Fresh Water Fishing Laws

Special Regulations

Angelina County: Unlawful to use nets the meshes of which are smaller than three inches square.

Archer County: Closed season on bass, perch, bream, crappie, and catfish February 1st to May 1st in Wichita River, Lake Kemp and Diversion Lake. No bream under five inches. Not more than ten bass or twenty crappie or a total of twenty crappie, perch, bream, and catfish in one day. Not more than twenty pounds of bass and an aggregate of not more than twenty pounds of crappie, perch, bream and catfish. Aggregate of all kinds not over thirty pounds. No nets and seines except twenty foot minnow seine for taking bait. Unlawful to take or possess channel or blue catfish less than eleven inches in length. May use one trotline per person or not more than two per party of two or more. Trotlines must not be set nearer than fifty (50) feet or contain more than fifty (50) hooks with any two hooks thereon nearer than four (4) feet. Unlawful to offer for barter or sale bass, perch, crappie, catfish, or other fish except minnows for bait.

Bandera County: Closed season, March 1st to June 1st, except Medina Lake, which is closed during February, March and April. Daily bag limit—Bass, 10; catfish, 10; bream, 10; or an aggregate of 20 of the above-named fish in one day. Possession limit—same as daily limit. Length limits—Catfish, 9 inches; bass, 11 inches; crappie, 7 inches. Fishing gear—unlawful to use any device equipped with more than 2 hooks, except artificial lures. Bottles, floats and cans prohibited unless line is held by fisherman or tied to stationary object. May use 20-foot minnow seines for taking minnows for bait. Unlawful to take or possess for purpose of sale any catfish, perch, crappie, bream or bass. Unlawful to sell minnows taken in County, or to transport more than 200 such minnows from County.

Baylor County: Same as Archer County.

Bastrop County: Unlawful to use seine or net of less than three (3) inch square mesh. Minnow seines of not more than twenty (20) feet in length to be used for taking minnows for bait are permitted. Provided, however, no seine shall be used during the months of March and April.

Bell County: Lawful to take suckers, buffalo, carp, shad or gar during July, August, September and October with seine or net, the meshes of which shall be not less than one inch square; and the same species of fish may be taken with wire, rope or gig at any time of year, provided that any bass, crappie or white perch, catfish, perch or trout caught by above methods must be immediately returned to water. Unlawful to possess any of above game fish while any of above rough fish are in possession. Unlawful to sell minnows taken in County. Unlawful to take more than 125 minnows out of County.

Bexar County: Closed season on bass, perch, crappie, catfish, February 1st to May 1st. Limit per day ten bass, ten crappie. No nets and seines except twenty foot minnow seine. Unlawful to sell any bass, crappie, channel or other catfish.

Blanco County: Closed season on all fishing, March and April. May use trotline, or any other device equipped with not more than two hooks. Daily bag limit—Bass, 10; catfish, 10; bream, 10; or an aggregate of 20 of the above-named fish in one day. Possession limit—Same as daily bag limit. Length limit—Catfish, 9 inches; bass, 11 inches; crappie, 7 inches. May use 20-foot minnow seine for taking minnows for bait. Unlawful to take or possess for purpose of sale any catfish, perch, crappie, bream or bass. Unlawful to sell minnows taken in County, or to transport more than 200 such minnows from County. May take suckers, buffalo, carp, shad or gar with seines and nets of not less than one inch mesh during July, August, September and October or any time with wire, rope or gig but may not possess other fish when using such devices.

Bosque County: Lawful to use set nets of not less than one and one-half inch square mesh to take suckers, buffalo, carp, shad and gar during November, December, January, February, May and June, but may not possess any bass, crappie, catfish, perch, or bream while in possession of such rough fish. Unlawful to take any fish with drag seines or nets of any kind during November, December, January, February, May and June. May take channel or Opelousas catfish and perch at any time with ordinary hook and line only. May take suckers, carp, buffalo, shad and gar during July, August, September and October with seine or net of not less than one inch square mesh, or at any time with wire, rope, or gig, but may not possess other fish while using such devices. Minnows may be sold in Bosque County only by licensed bait dealers. Unlawful to transport minnows out of County for purpose of sale, and transportation of more than 100 minnows out of County shall be evidence of violation of this law.

Bowie County: No seines permitted at any time, except 20-foot minnow seine for taking minnows only. Three-inch square mesh hoop, trammel or gill

nets permitted except during March and April. May take fish with hook, seine, net, or trap from Red River.

Brewster County: Unlawful to sell or offer for sale any fish taken in County.

Brown County: Unlawful to use seine or net except 20-foot minnow seine to take minnows for bait. Unlawful to sell bass, crappie, or catfish taken in County. Unlawful to take more than 35 fish per day.

Burnet County: Unlawful to sell bass, crappie or catfish taken in County. Unlawful to take more than 35 fish in a day. Seines and nets prohibited except as follows: (1) Twenty foot minnow seine may be used to take minnows for bait; and (2) May take suckers, buffalo, carp, shad and gar during July, August, September and October with seines and nets the meshes of which are not less than one inch square, or at any time with wire, rope or gig, but may not possess other fish when using such devices. Unlawful to take catfish less than nine inches in length. Special regulations apply to Burnet County lake waters. See Colorado River Lakes Regulations.

Cass County: No seines permitted at any time except 20-foot minnow seines for taking minnows only. Three-inch square mesh hoop, trammel or gill nets permitted except during March and April. May take fish with hook, seine, net or trap from Red River.

Chambers County: Same as Mitchell County.

Cherokee County: Seines and nets prohibited during February, March, April and May except twenty (20) foot minnow seine for taking minnows for bait.

Coke County: Unlawful to transport more than 200 minnows from County for any purpose, and may transport no minnows from County for purpose of sale. May not use trotline or throw line equipped with more than 25 hooks. A person or group of persons in same party may not use more than two trotlines or throw lines of 25 hooks each, or an aggregate of more than 50 hooks, whether used on two or more lines. Unlawful from February 15th to April 30th to take any fish, except that suckers, carp and gar may be taken during above-mentioned closed season by use of wire loop only. Length limit on catfish, 11 inches. Unlawful to take in any one day or to possess more than 15 catfish.

Coleman County: Unlawful to sell bass, crappie, white perch or catfish taken in County. Bag limit—35 fish per day. May use 20-foot minnow seine to take minnows for bait.

Comal County: Unlawful to take fish by any means or device other than ordinary pole and line or throw line with not more than two (2) hooks, or trotline with hooks not less than six (6) feet apart, provided however it shall be lawful to use dowgiac or other artificial bait equipped with more than two (2) hooks. Twenty (20) foot minnow seine permissible for taking bait. Bag limit, ten fish of any kind per day or thirty (30) per week except perch, twenty (20) per day or sixty (60) per week. Closed season on bass, perch, crappie and catfish from February 1st to May 1st. Catfish must be not less than twelve (12) inches.

Collin County: Same as Bell County, except that special Bell County minnow law does not apply.

Concho County: Unlawful to sell bass, crappie, white perch or catfish taken in County. Bag limit—35 fish per day. Unlawful to take any catfish less than 11 inches in length. Unlawful to transport more than 200 minnows from County. May use 20-foot minnow seine to take minnows.

Cooke County: Unlawful to sell fish taken in County. May take fish in Red River with hooks, traps, seines or nets. Seines and nets are otherwise unlawful with the following exceptions: (1) May use 20-foot minnow seine to take minnows for bait; and (2) May take suckers, buffalo, carp, shad or gar during July, August, September and October with seines and nets, the meshes of which are not less than one inch square, or may take these species at any time with wire, rope or gig, but may not possess other fish when using any of these devices.

Coryell County: Length Limits—Bass, 11 inches; crappie, 7 inches; catfish, 9 inches. Unlawful to sell minnows taken in County. Unlawful to transport from County more than 125 minnows. May use 20-foot minnow seine to take minnows. May take suckers, buffalo, carp, shad or gar during July, August, September and October with one-inch square mesh seines or nets, or at any time with wire, rope or gig, but may not possess other fish when using such devices. Sale of non-game fish permitted.

Culberson County: Unlawful to sell or offer for sale any fish taken in County.

Dallas County: Unlawful to take fish by any means other than ordinary pole and line, rod and reel, set line, throw line or trotline. No throw line or trotline shall have hooks closer than 3 feet apart. Any illegal tackle in possession closer than 200 yards of any public water shall be evidence of

General Regulations

Licenses Required: Resident citizens of Texas must procure an Artificial Lure License, price \$1.10, when fishing with artificial lures in fresh water. This license is not required of those using artificial lures in salt water. Otherwise these are no exemptions because of age or any other reason.

Non-residents of Texas or aliens must procure a Non-Resident or Alien Fishing License, price \$5.00, or a Five Day License, price \$1.10, when fishing with any kind of bait in fresh water. Such licenses are not required of non-residents or aliens fishing in salt water. A non-resident is any citizen of the United States who has not been a bona fide resident of Texas for four months preceding his application for a license.

Unlawful for any resident citizen of Texas to fish in the Counties of Mason, Menard, Kerr, Schleicher, Crockett, Sutton, Kimble, Real, Edwards, Blanco, Llano, Kendall, Gillespie, El Paso, Hudspeth, Culberson, Val Verde, Kinney, Terrell and Brewster without a resident fishing license, except persons under 17 years of age shall not be required to hold such license and except persons fishing on land they own or on which they reside shall not be required to hold a resident fishing license. Fee for Resident Fishing License is 55 cents.

A seine or net license is required of commercial fishermen operating in fresh waters as well as those operating in salt water. (See Salt Water and Commercial Fishing Laws in this Digest).

A license is required to sell fish. (See Salt Water Laws in this Digest).

An artificial lure is any manufactured bait or imitation of a natural bait.

Method of Taking: Ordinary pole and line, setline, trotline, artificial lures and seines or nets of not less than three inch square mesh, except a seine or net made of wire or other metallic substance or fish traps. Minnow seines not more than twenty feet in length for the purpose of taking minnows for bait are permitted. All other methods or means of taking fish are prohibited unless especially noted below.

Closed Season: Unlawful to take bass or crappie during the months of March and April. Unlawful to use seines or nets or artificial lures during these months. Special county restrictions noted below.

Size Limits: Black bass not less than eleven inches, crappie not less than seven inches, with exceptions on these and other fish in certain counties noted below.

Sale Prohibited: Sale of black bass or crappie or white perch prohibited in all Counties. Special sale restrictions noted below.

Bag Limit: Unlawful to take in any one day more than fifteen bass, fifteen crappie or white perch, thirty-five bream, thirty-five goggle-eye or an aggregate of more than fifty of these species, or to possess at any one time more than thirty bass, thirty crappie or white perch or seventy bream or seventy goggle-eye. This provision does not apply to certain Counties, as follows: Andrews, Bailey, Brazoria, Borden, Brooks, Callahan, Chambers, Cottle, Cochran, Crosby, Cameron, Dawson, Dickens, Duval, Eastland, Ellis, Fort Bend, Fisher, Floyd, Frio, Galveston, Garza, Gaines, Hill, Hood, Haskell, Hale, Hockley, Howard, Hidalgo, Johnson, Jones, Jim Hogg, Jim Wells, King, Kent, Kenedy, Kleberg, Lamb, Lubbock, Lynn, La Salle, Matagorda, Mitchell, Motley, Martin, McMullen, Nueces, Somervell, Scurry, Shackelford, Stephens, Stonewall, Starr, Taylor, Throckmorton, Terry, Wharton, Willacy, Webb, Yoakum, Zapata, Zavala.

Minnow Laws: License required for dealing in minnows. (See Commercial Fishing Laws).

Notice: It is unlawful to take, catch, ensnare or trap any fish by any method in any waters within the confines of any public park under the control of the Texas State Parks Board, without the consent of the keeper, caretaker or superintendent of the park in question.

Unlawful to fish from deck or road surface of any highway bridge or causeway maintained by State Highway Department or to leave any dead fish or bait on such property.

In order to understand the fishing regulations in a County where there is a special law it must be understood that the special County regulations listed below are supplementary to the general regulations and any restrictions contained in a special law must be obeyed even though they appear to be in conflict with the general law and likewise any privilege granted in a special law may be enjoyed without concern for general restrictions.

violation of law. Lawful to use artificial lure with more than two hooks. Length limit on catfish, nine inches. May use a minnow seine not greater than 20 feet in length for taking minnows for bait. Bag limit: White perch 15, bass 10, green perch 25, catfish 25. May not possess more than a total of 15 bass and white perch or total of 35 fish mentioned above.

Delta County: Lawful to grabble for catfish, perch, buffalo and drum, or to take such fish with a one-inch square mesh seine or net, except during March and April.

Denton County: May take suckers, buffalo, carp, shad or gar with seine or net of not less than one-inch mesh during July, August, September or October or at any time by wire, rope or gig but may not possess other fish when using such device. Limit not more than twenty (20) crappie, fifteen (15) bass or an aggregate of twenty (20) such fish in one day. Sand bass may be taken at all times with natural bait. May not take more than 15 sand bass in one day, or more than 10 per day during March and April. Possession limit, same as one day's bag limit. May not take sand bass of less than 9 inches in length.

De Witt County: May take suckers, buffalo, carp, shad or gar with seine or net of not less than one-inch mesh during July, August, September or October, or any time by wire, rope or gig, but may not possess other fish when using such devices. Unlawful to sell or buy any fish taken in County.

Dimmit County: Closed season on all fish, January 1st to May 1st. Unlawful to sell minnows taken in County, and unlawful to transport from the County any minnows for sale. Unlawful to sell bass, crappie or catfish taken in County. Unlawful to take more than 35 fish per day. Seines and nets prohibited except as follows: (1) May use 20-foot minnow seine to take minnows for bait; and (2) May use seines or nets of not less than one-inch square mesh to take buffalo, carp, shad, gar or suckers during July, August, September or October, or at any time with wire, rope or gig, but may not possess any other species of fish while using such devices.

Edwards County: Same as Kerr County.

El Paso County: Seines and nets, except ten-foot minnow seine with meshes not larger than three-

Colorado River Lakes Regulations

Lake Buchanan—May fish only with ordinary pole and line, throw line of not more than 6 hooks, rod and reel, artificial bait, and trotline with not more than 30 hooks. Closed season on all fish, except catfish and gasper, during March and April. Size limits: Black bass, 11 inches; white bass, 11 inches; crappie or white perch, 7 inches; catfish, 9 inches. Bag limit: Black bass, 10; white bass, 10; crappie or white perch, 10; catfish, 10; or an aggregate of 20 fish in one day. Unlawful to have in possession at any one time more than 20 fish taken from waters of Lake Buchanan. Roy Inks Lake, Marble Falls Lake and the Burnet County portion of Lake Travis.

Roy Inks Lake—Same as Lake Buchanan.

Lake Travis in Burnet County—Unlawful to use trotline. May use only ordinary pole and line with not more than 2 hooks, throw line with not more than 6 hooks, rod and reel with not more than 2 hooks, or artificial lures used with casting or fly rod. These regulations apply not only to Lake Travis in Burnet County, but also to the waters of the Colorado River from the Travis County line in Lake Travis up to the Burnet-Llano County line, which is only a short distance east of Slickrock Creek. Closed season for the Burnet County portion of Lake Travis, and also for Marble Falls is during the months of March and April, except for catfish and gasper. Bag possession and size limits, same as for Lake Buchanan.

Lake Travis in Travis County—Closed season: March and April. No closed season on carp, shad, buffalo fish, catfish, and gar. Fishing gear permitted: ordinary pole and line; rod, reel and line; hand line; set line; throw line; trotline and artificial lures, but no person is permitted to use more than 20 hooks at any one time on any or all of these devices. Bag and possession limits: Black bass, 5; white bass, 8; crappie, 8; bream or goggle-eye, 10; catfish, 6; gaspergou, 10. May not take or possess more than 10 in the aggregate of all fish named in any one day. Size limits: Black bass, 11 inches; white bass, 11 inches; crappie, 7 inches; catfish, 11 inches; gaspergou, 11 inches.

Lake Austin. Closed season, March and April. No closed season on carp, shad, buffalo fish, catfish and gar. Fishing gear permitted: ordinary pole and line, rod, reel and line; hand line; set line; throw line; except when artificial lures are used no line shall be equipped with more than two (2) hooks, and only two (2) lines shall be used by one person at the same time. Minnow seines not more than twenty (20) feet in length may be used during the open season only for taking minnows, carp, shad, buffalo fish, and/or gar fish. Bag or possession limit: black bass 5; crappie 8; white bass 8; bream and/or goggle-eye 10; catfish 6; or 10 gaspergou, or more than 10 in aggregate of all varieties of fish. Size of fish: black bass, 11 inches; crappie, 7 inches; white bass, 11 inches; catfish, 11 inches; gaspergou, 11 inches.

FLY fishing and bait casting in recent years have placed a premium on skill in fishing. Each year more fishermen use barbless hooks, less vicious baits and lighter tackle with the idea of giving their quarry a sporting chance. Skill rather than the quantity of fish taken has become the policy of the good sportsman.

eighths inch square prohibited. Limit: Ten fish of any kind in any one day except perch. Not more than twenty perch in one day. Unlawful to possess more than thirty fish of any variety in any week except perch, and not more than sixty perch in any week. Unlawful to sell any fish in County.

Erath County: Unlawful to sell or buy any fish taken from Lake Waco or Bosque River or their tributaries in Erath County. Unlawful to use drag seines or nets of any kind. May not use more than one hook on any line, except when using artificial baits. Minnows may be taken with approved minnow traps or dip nets of not more than 36 inches in diameter, or 20-foot minnow seine. Minnows may not be sold. Lawful to take fish with natural bait at any time of the year, except bass and crappie during March and April. Size limits: Bass, 11 inches; crappie, 8 inches; green perch, bream, goggle-eye or sunfish, 5 inches; catfish, 10 inches. Daily bag limit—Bass, 8; crappie, 12; green perch, bream, goggle-eye or sunfish, 20; channel or Opelousas catfish, 15; or an aggregate of not more than 20 pounds of above-named fish. Unlawful to troll from motor boat.

Falls County: Unlawful to sell or buy any fish taken from Brazos River or from waters within one mile of the mouth of any tributary of the Brazos River in Falls County. Unlawful to transport more than 125 minnows out of County.

Fannin County: May take suckers, carp, buffalo, shad or gar with seine or net of not less than one-inch mesh during July, August, September and October, or at any time with wire, rope or gig, but may not possess other fish when using such devices. Lawful to take fish from Red River with hooks, traps, seines or nets at any time.

Fisher County: Same as Mitchell County.

Franklin County: Same as Delta County.

Gillespie County: Same as Kerr County, except may take suckers, buffalo, carp, shad or gar during July, August, September and October with seine or net of not less than one-inch square mesh, or at any time with wire, rope, or gig, but may not possess other fish when using such devices.

Gonzales County: Unlawful to take bass, crappie, white perch, calico bass or bream during the months of February, March and April. May take suckers, buffalo, carp, shad or gar with seine or net of not less than one-inch mesh during July, August, September, or October or at any time by wire, rope or gig, but may not possess other fish when using such devices.

Grayson County: Fishing gear—ordinary hook and line, set line, throw line, cord line. Size limits—Bass, 8 inches; crappie, one-half pound. Unlawful to sell fish taken in County. May take suckers,

buffalo, carp, shad or gar with seine or net of not less than one-inch mesh during July, August, September and October, or at any time with wire, rope or gig, but may not possess other fish when using such devices. Lawful to take fish from Red River with hooks, traps, seines or nets.

Guadalupe County: Unlawful to offer for sale fish taken in County. Closed season on bass, perch, crappie and catfish from February 1st to May 1st. Seines and nets prohibited except minnow seine of not more than ten feet in length for taking minnows for bait. Size: Catfish not less than twelve (12) inches, crappie or white perch not less than seven (7) inches, and bass not less than eleven (11) inches. Bag limit not more than ten (10) fish of any one kind a day or not more than thirty (30) such fish in any one week, except perch, twenty (20) of which may be taken in one day and not more than sixty (60) a week.

Hamilton County: May use set nets of one and one-half inch square mesh at any time to take suckers, buffalo, carp, shad and gar, but may not take or possess any other fish when using these devices. Unlawful to use drag seines or drag nets at any time, except 20-foot minnow seines to take minnows for bait. Unlawful to take fish by giggering, roping, snaring, grappling with hands, or by the use of grab hooks or fish traps of any kind. May take catfish and perch at any time with trotlines, throw lines, set hooks or ordinary pole and line. Size limit on catfish, 10 inches. Unlawful to sell or buy any catfish taken in County. Unlawful to take minnows for purpose of sale or to transport from County more than 125 minnows at any one time.

Harrison County: Closed season on game fish, February 15th to April 15th. The term "game fish" does not include striped bass, so far as closed season is concerned. Lawful to take striped bass during closed season with artificial bait. Fishing gear—Ordinary hook and line, rod and reel, set hook and line, trotline or artificial bait. May use twenty-foot minnow seine to take minnows for bait. May use hoop net, set net or trammel net, meshes of which are not less than three and one-half inches square to take buffalo, gar, catfish, shad, bowfin or grindle at any time except February, March, April and May. Unlawful to possess any other fish when in possession of the above-named fish. Length limits—Bass, 11 inches; crappie, 8 inches. Daily bag limit—Bass, 15; crappie, 15; or an aggregate of not more than 30 of both bass and crappie; 30 game fish; goggle-eye, 36; bream, 66. Possession limit—Same as daily bag limit. Unlawful for hired fish guides to take or have in possession any bass or crappie while in service. Unlawful to impound any game fish (defined for these purposes as crappie, large-mouthed black bass, small-mouthed black bass and white or striped bass) in any live box or pond. Unlawful to keep in storage more than 30 game fish, as defined in preceding sentence. May transport not more than 30 game fish actually caught by person

used during months of February, March, April and May. Twenty-foot minnow seines may be used to take minnows for bait.

McCulloch County: May not sell any bass, crappie, white perch or catfish taken in County. Bag limit—35 fish per day. Seines and nets unlawful, except 20-foot minnow seine to take minnows for bait, and except may use three-inch mesh net to take carp and suckers in Colorado River. Unlawful to transport minnows out of County.

McLennan County: Unlawful to sell or buy any fish taken. Drag seines or nets prohibited. May use ordinary pole and line, throw line, artificial bait, or trotline. Trotline may not be used in Lake Waco during March and April and may not contain more than 50 hooks, and hooks must not be spaced closer than three feet apart. Minnows may be taken with 20-foot minnow seine, dip net of not more than 36 inches diameter, or approved minnow trap. May use shad for bait at any time. Closed season on bass, crappie, perch, channel or Opelousas catfish—March and April. Size limits—Bass, 11 inches; crappie, 8 inches; green perch, bream, goggle-eye or sunfish, 5 inches; catfish, 10 inches. Daily bag limit—Bass, 8; crappie, 12; green perch, bream, goggle-eye or sunfish, 20; channel or Opelousas catfish, 15; or an aggregate of not more than 20 pounds of above-named fish. Unlawful to troll from motor boat.

Nacogdoches County: Unlawful to use seine or net except during June, July, August, September, October, November and December. Must not be less than three inch square mesh and bass, trout, crappie or white perch taken in seine or net must be returned to water. Twenty-foot minnow seine for taking bait permitted.

Newton County: Unlawful to use nets the meshes of which are larger than three inches square. Unlawful to sell any bass, white perch, or catfish less than 18 inches, taken from the waters of the Sabine, Attoyac, Angelina or Neches Rivers, or their tributaries, in Newton and Jasper Counties.

Nolan County: Fishing gear permitted—Pole and line, artificial lures used with rod and reel, fly rod, trotline with not more than 25 hooks, and throw line with not more than two hooks. Unlawful for any person to use or be in any way connected with more than one trotline equipped with not more than 25 hooks. Unlawful to use more than one throw line equipped with not more than two hooks. Twenty-foot minnow seines for taking bait permitted. Length limits—Catfish, 11 inches; bass, 11 inches; crappie or white perch, 8 inches; bream, 5 inches; perch, 5 inches. Daily bag and possession limits—Bass, 6; catfish, 6; crappie or white perch, 15; bream, 15; or an aggregate of 20 of the above-named fish. Closed season on all fishing during February, March and April. Unlawful to in any way use private floating rafts, piers or boats without consent of owner.

Orange County: Same as Mitchell County.

Palo Pinto County: Same as Stephens County.

Parker County: May take suckers, buffalo, carp, shad or gar with seine or net of not less than one inch mesh during July, August, September, and October or at any time by wire, rope or gig, but may not possess other fish when using such device. Unlawful to transport minnows out of County.

Pecos County: Unlawful to sell any fish taken in County. Bag limit: 35 fish per day. Seines and nets unlawful except minnow seines not more than 20 feet in length.

Possum Kingdom Lake Regulations: No fishing permitted at any time within one-fourth mile of Possum Kingdom dam in the lake proper. Fishing gear permitted—Ordinary pole and line, throw line equipped with not more than three hooks, rod and reel and ordinary baits and lures. Persons fishing for carp, buffalo, suckers and gar may in addition use wire loop snares. Length limits (measure from snout to fork of tail)—Black bass, white bass, channel catfish, blue catfish and yellow catfish, 11 inches; crappie, 7 inches. Daily bag limits—Black bass, 7; white bass, 7; catfish, of one kind or in the aggregate, 7; crappie of any one or all species, 12; smaller sunfishes such as bluegill bream, green perch, Warmouth bass, goggle-eye, etc., 30 in the aggregate. Possession limit while person is on lake, not more than one day's bag limit of above-named fish. Possession limit of above-named fish after they have been removed from lake to shore, not more than two days' bag limit. Carp, suckers, buffalo and gar may be taken or possessed in any number. Seines or nets for taking fish or minnows prohibited. Trolling from motor boat or any other power-driven boat prohibited. Unlawful to sell or buy any fish taken from Possum Kingdom Lake. Special license, price \$1.10, required of all persons over 17 who fish in lake. Those fishing with artificial lures also must have an artificial lure license, price \$1.10.

Presidio County: Unlawful to sell or offer for sale any fish taken in County.

Rains County: Same as Hunt County.

Real County: Same as Kerr County.

Red River County: May take fish from Red River with hooks, traps, seines or nets.

Reeves County: Unlawful to sell any fish taken in County. Bag limit, 35 fish per day. Seines and nets unlawful except 20-foot minnow seines used for taking minnows for bait.

Rockwall County: Fishing gear—ordinary hook and line, set line, throw line, cord line. Seines and nets of one and one-half inches may be used during July, August and September. Size limits—Bass, 8 inches; crappie, one-half pound. Unlawful to sell fish taken in County.

Runnels County: Unlawful to sell bass, crappie, white perch or catfish taken in County. Bag limit—35 fish per day. Seines and nets prohibited, except 20-foot minnow seines to take minnows for bait.

Rusk County: Three and one-half inch hoop net, set net or trammel net may be used for taking buffalo, gar and catfish, shad and bowfin or grindle at any time except during February, March, April, and May. Unlawful to possess other fish when using net or seine. Twenty (20) foot minnow seine permissible for taking bait.

Sabine County: Nets prohibited. May take fish with seine of not less than three inch square mesh in Sabine River in Sabine County. May use 20-foot minnow seine.

San Augustine County: Nets prohibited. Twenty-foot minnow seines may be used.

San Patricio County: Same as Jim Wells County.

San Saba County: Unlawful to take fish for sale or to use any device other than ordinary pole and line or throw line equipped with not more than 2 hooks, except artificial bait. Seines and nets prohibited except as follows: (1) May use 20-foot minnow seine to take minnows for bait; and (2) May use seines or nets of not less than one inch square mesh to take suckers, buffalo, carp, shad, or gar during July, August, September and October, or may use wire, rope or gig at any time to take the above-mentioned fish, but may not possess any other fish when using the devices outlined above. Bag limit—Not more than 10 fish of any one kind per day or more than 30 in any one week except perch; and not more than 20 perch per day or 60 per week. Length limit for catfish, 12 inches. Special law applies to lakes. See Colorado River Lakes Regulations.

Shackelford County: Unlawful to take any fish for commercial purposes.

Somervell County: Same as Johnson County, except that it is unlawful to take minnows for purpose of sale, and unlawful to transport more than 12 minnows from County.

Stephens County: Unlawful to take, catch or possess any fish taken from waters of Possum Kingdom Lake except in accordance with regulations issued by the Game, Fish and Oyster Commission. See Possum Kingdom Lake Regulations in this Digest. Unlawful to sell or buy any fish taken from above-mentioned waters. Unlawful to transport minnows outside of County. Special license required of all persons over 17 years of age who fish in Possum Kingdom Lake. Annual license fee, \$1.10. Those fishing with artificial bait must also have an artificial lure license, price \$1.10.

Sterling County: Same as Coke County.

Sutton County: Same as Kerr County.

Taylor County: Fort Phantom Hill Lake restrictions apply. See Jones County. Jones County law forbidding sale of fish for commercial purposes does not apply to Taylor County.

Terrell County: Unlawful to sell or offer for sale any fish taken in County.

Tom Green County: Unlawful to transport minnows from County for purpose of sale, and unlawful for any person to transport more than 200 minnows in any one day for any purpose. Trotline with more than 25 hooks, and throw lines with more than 25 hooks prohibited. Individual, or group of individuals in a party is limited to two such lines of 25 hooks each, or an aggregate of 50 hooks, whether used on two or more lines. Closed season February 15th to April 30th on all fish except suckers, carp and gar. Suckers, carp and gar may be taken during above-mentioned closed season by wire loop only. Catfish length limit—11 inches. May not take or possess in any one day more than 15 catfish. May not take more than 35 fish per day. Unlawful to sell bass, crappie or catfish taken in County. Seines and nets unlawful except 20-foot minnow seine to take minnows for bait.

Titus County: Lawful to use two-inch mesh seine or net except during March and April.

Travis County: Unlawful to take black bass, white bass, white perch or crappie during February, March and April. Unlawful to use artificial lures during February, March and April. Size limits—Black bass, 11 inches; white bass, 11 inches; crappie, 7 inches; catfish, 11 inches; gasper, 11 inches. Bag and possession limit—Bass, 10; crappie, 15; gasper, 15; catfish, 10; or an aggregate of 20 of such fish named. Fishing gear—hook and line, trotline, artificial lure, rod and reel, throw line. Hooks on trotline and throw line must not be closer than three feet apart. Unlawful to sell fish taken in County. May take suckers, buffalo, carp, shad and gar during July, August, September and October with seines and nets, the meshes of which are not less than one-inch square, or at any time with wire, rope or gig, but may not possess other fish when using such devices. Special law applies to lakes in Travis County. See Colorado River Lakes Regulations.

Tyler County: Same as Angelina County.

Upshur County: Lawful to take suckers with trammel net during February, March and April in Gin and Glade Creeks.

Uvalde County: Closed season March, April, May.

Val Verde County: The following special law applies to all Val Verde County except the waters of the Rio Grande, the Pecos River and San Felipe Creek located in that County. Closed season—February 15th to May 15th. Fishing gear permitted—ordinary pole and line; rod, reel, and line; hand line; set line; throw line; trotline; and artificial lures. May not use at any one time more than 20 hooks on any or all of these devices. Twenty-foot minnow seine for taking minnows and other bait may be used during open season only. Daily bag limit and possession limit—Black bass, 5; crappie, 10; white bass, 8; catfish, 6; or an aggregate of not more than 15 such fish. Unlawful to take or possess an aggregate of more than 25 of all other fish. Size limit—Black bass, 11 inches; crappie, 8 inches; white bass, 11 inches; catfish, 11 inches; and gasper, 8 inches. Unlawful to use crappie, catfish or bass for bait. Unlawful to transport out of County any minnows taken in County. Unlawful to sell any fish taken west of Pecos River. Certain species may be sold east of Pecos River in Val Verde County.

Walker County: Unlawful to transport for the purpose of sale or to take more than 200 minnows from County.

Ward County: Unlawful to sell bass, crappie, white perch or catfish taken in County. Bag limit—35 fish per day. Seines and nets unlawful except 20-foot minnow seine to take minnows for bait.

Williamson County: May not sell any bass, crappie, white perch or catfish taken in County. Bag limit—35 fish per day. Seines and nets prohibited, except 20-foot minnow seine to take minnows for bait. May not transport more than 200 minnows out of County.

Wilson County: Unlawful to sell any bass, perch, crappie or catfish taken in County. Explosives to kill fish prohibited. Fishing gear—Ordinary pole and line, trotline, artificial bait. Seines, nets and traps prohibited except 10-foot minnow seine of not less than one-fourth inch square mesh for taking minnows only for bait. Closed season on bass, crappie, perch and catfish—February, March and April. Daily bag limit: Bass, 10; crappie, 10.

Wichita County: Same as Archer County.

Wise County: Two-inch square mesh seine or net may be used in taking catfish, bass and perch except in artificial lakes containing more than twenty acres. Bag limit: White perch or crappie, fifteen; bass, ten; aggregate bass and crappie, fifteen in any one day.

Wood County: Seines and nets prohibited during March and April. At other times may use seine or net of not less than two inch square mesh to take catfish, drum, buffalo, suckers, carp, shad or gar, but may not catch any bass, trout, crappie, bream or other perch with any seine, net or trap at any time. May use fish traps to take drum, buffalo, carp, suckers, shad or gar at any time in the Wood County portion of the Sabine River, but may not retain any bass, trout, crappie or white perch, bream or other perch caught while so fishing. Unlawful to sell any bass, trout, crappie or white perch, bream or other perch taken in County.

Young County: Unlawful to sell any fish taken in County except those taken in Brazos River and Clear Fork of Brazos River. Unlawful to sell any fish taken from Possum Kingdom Lake. Unlawful to take, catch or possess any fish taken from waters of Possum Kingdom Lake except in accordance with regulations issued by the Game, Fish and Oyster Commission. See Possum Kingdom Lake Regulations in this Digest. Special license required of all persons over 17 years of age who fish in Possum Kingdom Lake. Annual Possum Kingdom Lake Fishing License sells for \$1.10. Those fishing with artificial bait in Possum Kingdom Lake must have in addition, an artificial lure license costing \$1.10. Unlawful to use seine or net in Clear Fork of the Brazos with mesh less than two inches square. Closed season on bass, crappie or white perch and bream, February 1st to May 1st. Size limits—Crappie, 8 inches; bream, 5 inches. Trolling from motor boat unlawful. Bag limit—Not more than 8 bass per day nor more than 20 pounds of such fish, nor more than 16 crappie, white perch, calico bass or bream or an aggregate of 16 of all such fish weighing not more than 20 pounds. Not more than 30 pounds of bass, crappie, sun perch, calico bass or bream may be taken in one day. Unlawful to take any bass less than 11 inches in length, or any crappie, drum or calico bass less than 8 inches in length from the Clear Fork of the Brazos River. Unlawful to transport minnows out of County.

Zavala County: Closed season on all fishing, January 1st to May 1st. May use three inch mesh seine or net during open season only to take buffalo, carp, gar and turtles, but may not possess any other fish when using such devices. May use one-inch seine or net to take suckers, buffalo, carp, shad and gar during July, August, September and October, or may take such fish with wire, rope or gig at any time, but may not possess any other fish while using such devices. Unlawful to sell minnows taken in County, or to transport from the County any such minnows. Unlawful to sell bass, crappie or catfish. Bag limit—30 fish per day.

transporting. May gig buffalo, gar, catfish, shad and bowfin or grindle in Caddo Lake. Unlawful to discharge pistol or rifle in, on, along or across Caddo Lake. Unlawful to operate any water craft in a reckless manner or to operate such craft while intoxicated. Unlawful to catch or have in possession any alligator or alligators.

Hardin County: Same as Mitchell County.

Hays County: Unlawful to take any kind of fish during February, March, and April.

Hill County: Unlawful to transport minnows outside of County.

Hood County: May take any fish with natural bait at any time of the year, except bass and crappie during March and April. May take minnows with dip net or 20-foot minnow seine. Unlawful to take minnows for sale.

Hopkins County: Same as Delta County.

Hudspeth County: Unlawful to sell or offer for sale any fish taken in County.

Hunt County: May use ordinary hook and line, set line or throw line, and from March 1st to September 30th may use seines and nets of not less than one and one-half inch square mesh. Lawful to sell catfish, carp, buffalo, and drum, but unlawful to sell other fish. May use 20-foot minnow seine to take minnows for bait.

Irion County: Same as Coke County.

Jack County: Two-inch square mesh seine or net may be used in taking catfish, bass and perch except in artificial lakes containing more than twenty (20) acres. Unlawful to transport minnows outside of County. Possession of more than 500 minnows is evidence of intention to transport same. Unlawful to use any hoop net or trammel net for the purpose of taking fish.

Jackson County: Seines and nets prohibited except twenty (20) foot minnow seine for catching bait. Flounder gigs permitted.

Jasper County: Same as Newton County.

Jeff Davis County: Unlawful to sell or offer for sale any fish taken in County.

Jefferson County: Same as Mitchell County.

Jim Wells County: Unlawful to take for purpose of sale any fish from Lake Corpus Christi in San Patricio, Jim Wells and Live Oak Counties, or from the waters of Nueces River between Calallen Dam and west boundary line of Live Oak County on Nueces River, including all the waters within all the tributaries of the Nueces River within Live Oak, San Patricio and Nueces Counties. Unlawful to use seine or net, except 20-foot minnow seine for taking minnows for bait. Unlawful to use trotline with hooks less than three feet apart. Unlawful to take any fish from waters described above during months of February, March and April.

Johnson County: Seines and nets prohibited except for 20-foot minnow seine to take minnows for bait, and except for seine or net of not less than three-inch square mesh to take suckers, carp, buffalo and gar. Length limits—Bass, 11 inches; catfish, 9 inches; crappie or white perch, 7 inches. May take minnows for sale if same are to be used in Johnson County, but it is unlawful to take minnows for sale if they are to be used outside of County. Unlawful to transport more than 125 minnows outside of County.

Jones County: Unlawful to take any fish in County for commercial purposes. The following additional restrictions apply only to Fort Phantom Hill Lake: Fishing gear—Person may use not more than two ordinary poles and lines, rods and reels, fly rods, or throw lines each equipped with not more than two hooks. Artificial lures may be used, seines, nets or traps prohibited, except 20-foot minnow seine for taking bait. Length limits—Catfish, 12 inches; bass, 12 inches; crappie or white perch, 9 inches; bream, 5 inches; perch, 5 inches. Bag and possession limits—Bass, 5; catfish, 5; crappie or white perch, 10; perch, 10; bream, 10; or an aggregate of 15 of the above-named fish. Closed season on all fishing—February, March and April. Unlawful to take minnows for purpose of sale, and unlawful to possess more than 100 minnows at any one time.

Kaufman County: May use ordinary hook and line, set line, throw line, or cord line. Size limits: Bass, 8 inches; other fish, one-half pound. Unlawful to sell fish taken in County, except carp, buffalo, drum and catfish.

Kendall County: Lawful during open season to take fish with a trot or set line containing not more than 25 hooks and the hooks must be spaced not closer than four feet of one another. That portion of Balcones Creek which forms the boundary between Bexar and Kendall Counties, and which is situated in Kendall County, is closed to fishing between February 1st and May 1st of each year.

Kerr County: Closed season, March 1st to June 1st. Daily bag limit—Bass, 10; catfish, 10; bream, 10; or an aggregate of 20 of the above-named fish in any one day. Possession limit—Same as daily bag limit. Length limits—Catfish, 9 inches; bass, 11 inches; crappie, 7 inches. Fishing gear—Unlawful to use any device equipped with more than 2 hooks except artificial bait. Bottles, cans or floats prohibited

unless line is held by fisherman or tied to stationary object. May use 20-foot minnow seine for taking minnows for bait. Unlawful to take or possess for purpose of sale any catfish, perch, crappie, bream or bass. Unlawful to sell minnows taken in County, or to transport more than 200 such minnows from County.

Kimble County: May take fish only by ordinary pole and line or rod and reel or artificial bait. May not use more than one hook per line except on artificial bait. One person may not use more than 6 poles and lines or rods and reels at one time. May not take more than 10 bass, 10 catfish, 10 crappie, 10 perch, or 10 bream or more than 15 of all such fish. Size limit—Catfish, 11 inches; bass, 11 inches; crappie, 8 inches; perch or bream, 5 inches. Unlawful to sell any catfish, perch, crappie, bream or bass taken in County. Unlawful to take any fish during January, February, March and April; and unlawful to take catfish during January, February, March, April, May and June. Unlawful to transport more than 125 minnows from County. May take suckers, buffalo, carp, shad or gar during July, August, September and October with seines or nets

the meshes of which are not less than one inch square, or at any time with wire, rope or gig, but may not possess other fish when using such devices.

Lake Worth and Eagle Mountain Lake: Special license required of all persons over 17 years of age. Annual license fee, \$1.10; five day license fee, 35 cents. Holders of other valid fishing license are not exempt from holding Lake Worth-Eagle Mountain Lake license.

Lamar County: May use 20-foot minnow seine for taking bait. Lawful to take fish from Red River with hook, seine, net or trap. May take suckers, buffalo, carp, shad or gar with seine or net of not less than one-inch square mesh during July, August, September and October, or at any time with wire, rope or gig, but may not possess other fish when using such devices.

Lampasas County: Unlawful to sell bass, crappie, or catfish taken in County. Fishing gear—Ordinary hook and line, trotline, and artificial bait. Seines and nets prohibited, except as follows: (1) Twenty-foot minnow seine may be used to take minnows for bait; and (2) May take suckers, buffalo, carp, shad or gar during July, August, September and October with seines or nets the meshes of which are not less than one inch square, or at any time with wire, rope or gig, but may not possess other fish when using above-mentioned devices. Bag limit—35 fish per day. Special laws govern fishing in Lakes. See Colorado River Lakes Regulations.

Live Oak County: Same as Jim Wells County.

Llano County: Unlawful to take fish with any device equipped with more than 2 hooks, except artificial lure used with rod and reel. Twenty-foot minnow seine may be used to take minnows. Length limits—Catfish, 9 inches; bass, 11 inches; crappie, 7 inches. Bag and possession limits—Bass, 10; crappie, 10; catfish, 10; or aggregate of 20 of all such fish. Unlawful to take more than 20 perch in one day, and unlawful to take or have in possession more than 60 perch in a week. Unlawful to take or have in possession more than 30 of all the above-named fish, except perch in one week. Unlawful to sell catfish, perch, crappie, bream or bass. Closed season on all fishing, January, February, March and April. Special laws govern fishing in lakes. See Colorado River Lakes Regulations. May take suckers, buffalo, carp, shad and gar during July, August, September, and October with seines and nets of not less than one inch square mesh, or at any time with wire, rope or gig, but may not possess any other species of fish when using such devices.

Loving County: Unlawful to sell bass, crappie, white perch or catfish taken in County. Bag limit—35 fish per day. Seines and nets prohibited, except 20-foot minnow seine to take minnows for bait.

Marion County: Same as Harrison County with exception of alligator Section.

Mason County: Same as Kerr County, except that fishermen may take suckers, buffalo, carp, shad and gar during July, August, September and October with seines or nets of not less than one inch square mesh, or at any time with wire, rope or gig, but may not possess other fish when using such devices.

Medina County: Closed season on bass, crappie, perch and catfish—February, March and April. Bag limit—Bass, 10; crappie, 10. Unlawful to sell bass, perch, crappie or catfish taken in County. Seines and nets prohibited, except as follows: (1) Twenty-foot minnow seine may be used to take minnows for bait; and (2) May use seines or nets of not less than one inch square mesh to take suckers, carp, buffalo, shad and gar during months of July, August, September and October, and may use wire, rope or gig to take these fish at any time, but may not have other fish in possession while using such devices.

Medina Lake: Special license required of all persons over the age of 17 years. Annual license fee, \$1.00, daily license fee 30c. Holders of other valid fishing licenses are not exempt from holding Medina Lake license. Closed season—February, March and April.

Menard County: Same as Kerr County, except that closed season is during March and April only; bag and possession limit on perch is 15; and bag and possession limit on crappie is 10. And with the further exception that fishermen may take suckers, buffalo, carp, shad or gar during July, August, September and October with seines and nets of not less than one inch square mesh, or at any time with wire, rope or gig, but may not possess other fish when using such devices.

Mills County: Unlawful to sell bass, crappie, white perch or catfish taken in County. Bag limit, 35 fish per day. Seines and nets unlawful, except 20-foot minnow seines for taking minnows for bait.

Mitchell County: May take suckers, buffalo, carp, shad or gar with seine or net of not less than one inch mesh, during July, August, September or October, or any time by wire, rope or gig, but may not possess other fish when using such devices.

Morris County: Lawful to use two inch mesh seine or net except during March and April.

Montgomery County: May use seine of not less than three inch square mesh, except during the months of February, March, April, May and June. May use set nets or gill nets of not less than four inch square mesh to take any fish except crappie, perch, bass, and catfish, but such nets may not be

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Barbecued Fish

As a variation on customary methods of preparing fish, outdoors cooks should be interested in trying the following recipe for barbecued fish, for which any fair-sized scale fish may be used.

The fish should not be scaled, but slit down the backbone so that each side will lay flat. Place the fish on a hot grill, meat side down, until it has started to cook, and then turn and place scale side down. Salt to taste. With an ordinary small paint brush or other flat object, paint barbecue sauce on the meat side of the fish. Partially cook strips of bacon on the grill, and place on top of fish, and continue, at intervals, to paint barbecue sauce on fish and bacon until well done. Fish prepared in this manner may be eaten with a fork from the skin and scales in very much the same way as one would eat cantaloupe from the rind. The secret of delicious barbecued fish is in having a slow, steady fire over which the fish will cook well without burning or allowing the sauce to burn.

For the barbecue sauce the following ingredients may be used:

- ½ cup butter.
- 1 cup vinegar.
- 1 teaspoon salt.
- 3 teaspoons prepared mustard.
- 1 bottle (two cupfuls) catsup.
- 4 teaspoons Worcestershire sauce.
- 1 teaspoon tabasco sauce (optional).
- Juice of one lemon.

Cook the entire mixture until thick and well-blended.

Of methods of cooking fish after they are caught there is no end, this recipe is a little different.

It uses a species of fish on which there is no statewide closed season, and those who try this recipe will find that the lowly catfish can indeed be appetizing when properly prepared. Incidentally, the same methods can be used for pike or pickerel, being sure to cook the fish thoroughly to soften the many small bones.

Fish Fingers

Select large size catfish, and remove back bone, fins and other bones as completely as possible. Cut the meat in narrow strips about finger size. Season with salt and pepper to taste. Dip the strips in beaten egg, and then in cracker meal and fry in deep, hot fat in which one whole onion and one clove of garlic has previously ly been fried. Drain and serve.

Here is an effective method of securing boiled fish fit for a king.

Boiling

- 3 lbs. fillets or 4½ lbs. dressed fish.
- 3 tbsp. salt and 6 tbsp. vinegar in 2 qts. boiling water.

Place the fish in the boiling water and cook for 8 to 12 minutes until tender; remove and drain. The fish may be handled more easily if wrapped and tied in cheesecloth. Serve with a white sauce prepared as follows: Heat ¼ cup butter (or cooking oil), then stir in 4 tbsp. flour, ½ tsp. salt, and ¼ tsp. pepper until the whole is smooth; then stir in gradually, 1 pt. warm milk, continuing the stirring until the sauce is smooth. Chopped hard boiled eggs, grated cheese, finely chopped onion, etc., may be added as desired.

Raccoon

Wild meats from woods and fields are adding many tons of wholesome food to family dinner tables during these war-reduced days when brown ration stamps are hard to stretch.

Small fur animals, trapped annually for their pelts, are providing a food resource that is becoming increasingly important while domestic meat supplies are short. Among these small animals, the raccoon is one of the best liked for table use.

For housewives living in those sections of the country where large numbers of raccoons are taken every year by trappers and hunters, point-free platters of delicious meat are easy to prepare from the following recipes.

To improve the flavor of a dressed raccoon and to remove some of the gamey taste, it is recommended that the carcass be wrapped tightly in wax paper and stored from 4 to 7 days in a refrigerator, at a temperature as near to 35 degrees F. as possible.

Roast Raccoon With Raisin Nut Stuffing*

- 4-5 pound dressed raccoon.
- 2 teaspoons salt.
- ¼ teaspoon pepper.

Raisin Nut Stuffing

- 6 cups bread crumbs (raisin bread)*.
- ½ cup butter or fortified margarine, melted.
- ½ cup vegetable shortening, melted.
- 1 cup celery stalks and leaves, finely diced.
- 1 teaspoon salt.
- ¼ teaspoon pepper.
- 1 teaspoon sage.
- 1 cup walnuts, coarsely chopped.

Add celery to melted fat and simmer until tender. Add salt, pepper, sage, nuts,

and fat mixture to the bread crumbs, tossing lightly with a fork.

Before cooking the raccoon, be sure to remove the waxy nodules, commonly referred to as "kernels," from under each front leg and on either side of the spine in the small of the back. Wash the raccoon thoroughly and dry. Remove part of the fat, leaving just enough to cover the carcass with a thin layer of fat. Salt the inside of the raccoon with one teaspoon salt and stuff with raisin nut stuffing. Skewer the vent by inserting several toothpicks or clean sharpened matchsticks through the skin from side to side. Lace with string, tying the ends securely. Fasten both the forelegs and hind legs with toothpicks and string. If there are any lean parts on the outside of the raccoon fasten a small piece of the surplus fat to this part with a toothpick. Sprinkle the outside of the raccoon with the one teaspoon salt and ¼ teaspoon pepper. Place on side on the greased rack of a shallow greased baking pan and roast at 325° F. (moderate oven) for 45 minutes per pound. For a raccoon over five pounds decrease the roasting time to 35 minutes per pound. The raccoon should be turned when it is half done.

**Three-fourths cup of seedless raisins may be used with whole wheat or white bread if raisin bread is not available.*

Spiced Roast Raccoon

- 4-5 pound dressed raccoon.
- 1½ cups tarragon vinegar.
- 1½ cups water.
- ¾ teaspoon sweet basil.
- 1 tablespoon salt.
- ¾ teaspoon sugar.
- ¼ teaspoon pepper.

Sage Stuffing

- 6 cups bread crumbs (day-old bread).
- ¾ cup butter or fortified margarine, melted.
- 1½ cups onion, finely diced.
- 1 cup celery stalks and leaves, finely diced.
- 1½ tablespoons sage.
- 1 teaspoon salt.
- ¼ teaspoon pepper.

Add celery and onion to the melted fat and simmer until tender. Add salt, pepper, sage, and fat mixture to the bread crumbs, tossing lightly with a fork.

Before cooking the raccoon, be sure to remove the waxy nodules, commonly referred to as "kernels", from under each front leg and on either side of the spine in the small of the back. Wash the raccoon thoroughly. Combine vinegar, water, sweet basil, salt, sugar, pepper, and stir until sugar and salt are dissolved. Marinate raccoon overnight in this liquid. Rinse thoroughly in lukewarm water. Remove part of the fat from the raccoon, leaving the carcass covered with a thin layer of fat. Stuff with sage stuffing. Skewer the vent by inserting several toothpicks through the skin from side to side. Lace with string, tying the ends securely. Fasten both the forelegs and hind legs with toothpicks and string. Place on side on the greased rack of a shallow greased baking pan and roast at 325° F. (moderate oven) for 45 minutes per pound. For a raccoon over five pounds decrease the roasting time to 35 minutes per pound. The raccoon should be turned when it is half done.

EXTINCT AND VANISHING MAMMALS OF THE WESTERN HEMISPHERE WITH THE MARINE SPECIES OF ALL THE OCEANS, by Glover M. Allen. Special Publication No. 11 of the American Committee for International Wildlife Protection, xv+620 pages, 24 fig. New York, 1942. Price, paper \$2.00, cloth \$3.00. Reviewed by Gordon Gunter, Game, Fish and Oyster Commission.

THIS is the eleventh volume on broad phases of conservation and wildlife protection published by the American Committee for International Wildlife Protection, since the beginning of the series in 1931. It was conceived for the purpose of furnishing the committee with basic information to substantiate proposals for the protection of vanishing species of mammals in their native habitat. It was also felt that such information would be invaluable in helping to determine those species most in need of protection and in estimating the factors that have caused extinction.

The book was written by the late Dr. Glover M. Allen, the eminent authority on birds and mammals, of the Museum of Comparative Zoölogy at Harvard University.

Preparation of this work necessitated the assembling of a great deal of widely scattered information from popular magazines, books on sport and travel, and scientific literature. It also involved a great deal of correspondence with zoologists, game wardens, nature protection societies and governments in many parts of the world. It is essentially a compilation made by an authority who was as well or better fitted to evaluate the material than anyone else in the world.

There is a foreword by Harold J. Coolidge, Jr., of the Publication Committee and a short introduction by the author. He states that the account is intended to cover those species of New World mammals that have been exterminated or seriously depleted by man during the last four and a half centuries, and the marine mammals that have similarly suffered reduction since the dawn of history.

The text of the book is divided into three main parts: 1. North America and the West Indies, 2. South America and 3. Oceanic Mammals. The animals are taken up in the zoological order. A short description of each order, drawn up by Dr. J. Eric Hill of the American Museum of Natural History, is given. Then the animals are treated species by species. The method followed is to give the common name, the Latin name, reference to the original description and type locality (the locality from which the species were first described by zoologists), the important synonyms and references to figures of the animal or the skull. All these points are given for the purpose of showing precisely what species is dealt with. A brief description of the species including certain skeletal characteristics is also given for the same reason. This part of each account is necessary, but it is of more interest to the specialized student than the general reader. Following that there is a discussion of past and present geographic range, economic and commercial importance, present status, protective measures and miscellaneous facts related to protection, encouragement and control measures. In short each species is described and then



BOOKS



information related to its conservation is summarized and discussed.

The topic on North American mammals extends from pages 5 to 376, while that on South American mammals covers 42 pages, a fact reflective of the comparatively fresh and untrammled state of that great continent. The topic on oceanic mammals extends from pages 417 to 522. There is a bibliography of 36 pages and an index of 32 pages. The index was prepared by Mr. Paul H. Oehser of the U. S. National Museum, who served as editor of the volume. The book is illustrated by 28 excellent black and white drawings.

Game mammals, fur-bearers and other mammals of commercial importance and those of no known value to man, except as interesting or peculiar components of our wildlife, are all treated equally. The author has taken up various mammals that probably became extinct before the coming of the white man to America. Readers may be surprised to learn that possibly primitive man with his primitive weapons hastened or brought about the extinction of various mammals on this continent. Since the author has included those mammals that have become locally extinct, while remaining in other areas, a great number of species are included in the whole work and the general reader will find that probably almost any mammal he is particularly interested in is included. Nevertheless, the author states that the list is probably not complete enough. He has been criticized on that point as well as on the point that too many poorly differentiated species, such as the 69 species and subspecies of grizzly bears, have been included. While from the systematic standpoint these criticisms are probably justified, as one well-known zoologist has said, it is better to call attention to differences in a population of animals, even if an ill-defined species is set up, than to ignore or fail to mention the difference.

This book brings together a vast amount of specialized and hard to get information on a large number of mammals of the Western Hemisphere and marine mammals of the whole world. Its compilation was a huge task and in carrying the work to completion the author performed a great service for the cause of conservation and wildlife protection in general. This book is a fitting final achievement in the life of a great naturalist.

WATERFOWL IN IOWA, by Jack W. Musgrove and Mary R. Musgrove, illustrated by Maynard F. Reece, ix+122 pp. 12 plates. Iowa State Conservation Commission, Des Moines, 1943. Price \$1.00 postpaid. Reviewed by Gordon Gunter, Game, Fish and Oyster Commission.

IN the foreword Mr. Fred T. Schwob, Director of the State Conservation Com-

mission of Iowa, states that a definite need was felt for an inexpensive book on waterfowl with accurate color plates showing plumages of ducks not only in the full spring plumage, as is generally shown in bird books, but also the fall or eclipse plumage. The latter colors are particularly important to hunters, for present laws make it necessary for them to recognize the species of ducks sighted over the end of a gun barrel. This book not only fills the need for Iowa hunters, but it is probably the best book on ducks, geese and swans for the ordinary non-specialist layman and hunter ever printed in America. It is not too much to say that this book includes practically all the information about ducks, geese and swans that the average person east of the Rocky Mountains will ever need or care to know. It does not, of course, give particular information on the status of feeding, nesting and wintering grounds in the individual states, as it does for Iowa. The color plates are superb. They are not overcolorful as the plates are in most bird books. Texans will find accurate color pictures of almost every species of waterfowl they are ever likely to see, in natural poses, flying, resting, and swimming. Furthermore, the individual illustrations are small and more like the appearance of birds as they will be seen in the field in the distance than any published elsewhere.

The book was prepared in the museum division of the Iowa State Department of History and Archives. There are ten chapters. The first six takes up 38 species of swans, geese and ducks. The chief common name of each species is given, followed by the Latin name and the species number, as designated by the American Ornithologists Union. Other common names are given and there are usually several for each bird. The length range in inches and the range of weight in pounds is given. The following paragraphs headed in large print are: Description, which includes chiefly coloration of adult males and females, juveniles and hybrids if any; Field Marks, a general description of the species as it appears in the distance and in flight; Call; Breeding Range; Migrations; Winter Range; Nesting; Flood; and Iowa Status. Each paragraph is short and the discussion is far from exhaustive, but the facts of chief importance are brought out. The account for each species covers from one to three pages. A reference to the color plate showing the species is always given at the head of the account.

In chapter VII, entitled Seasonal and Individual Variation in Plumages, albinism, hybrids and water stains are also treated. Chapter VIII is Migrations and Flyways. Chapter IX, on Enemies of Waterfowl, discusses natural enemies, parasites and agencies of man. Chapter X is on lead poisoning.

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Based on studies by the U. S. Department of Agriculture, covering contents of 5,185 hawk stomachs. (See U.S.D.A. Circular No. 370, "Food Habits of Common Hawks," published 1935, price 5c, from Supt. of Documents, Washington, D. C.)

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PERCHING IN OPEN
LARGE SIZE
TAMENESS
SLOW FLIGHT
WIDE WINGS
SHORT, BROAD TAIL

FALCONS

RAPID FLIGHT
LONG, POINTED WINGS
DEEP WING STROKE
STREAMLINED SHAPE

MARSH HAWK

LOW COURSING FLIGHT
LONG WINGS AND TAIL
HIGH WING ANGLE

BIRD HAWKS

FLAP AND GLIDE FLIGHT
PERCHING UNDER COVER
DIRECT RAPID PURSUIT
SMALL SIZE
LONG TAIL
SHORT, BLUNT WINGS



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OSPREY—Lives entirely on fish, chiefly non-commercial varieties that swim near enough to the surface to be caught.

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