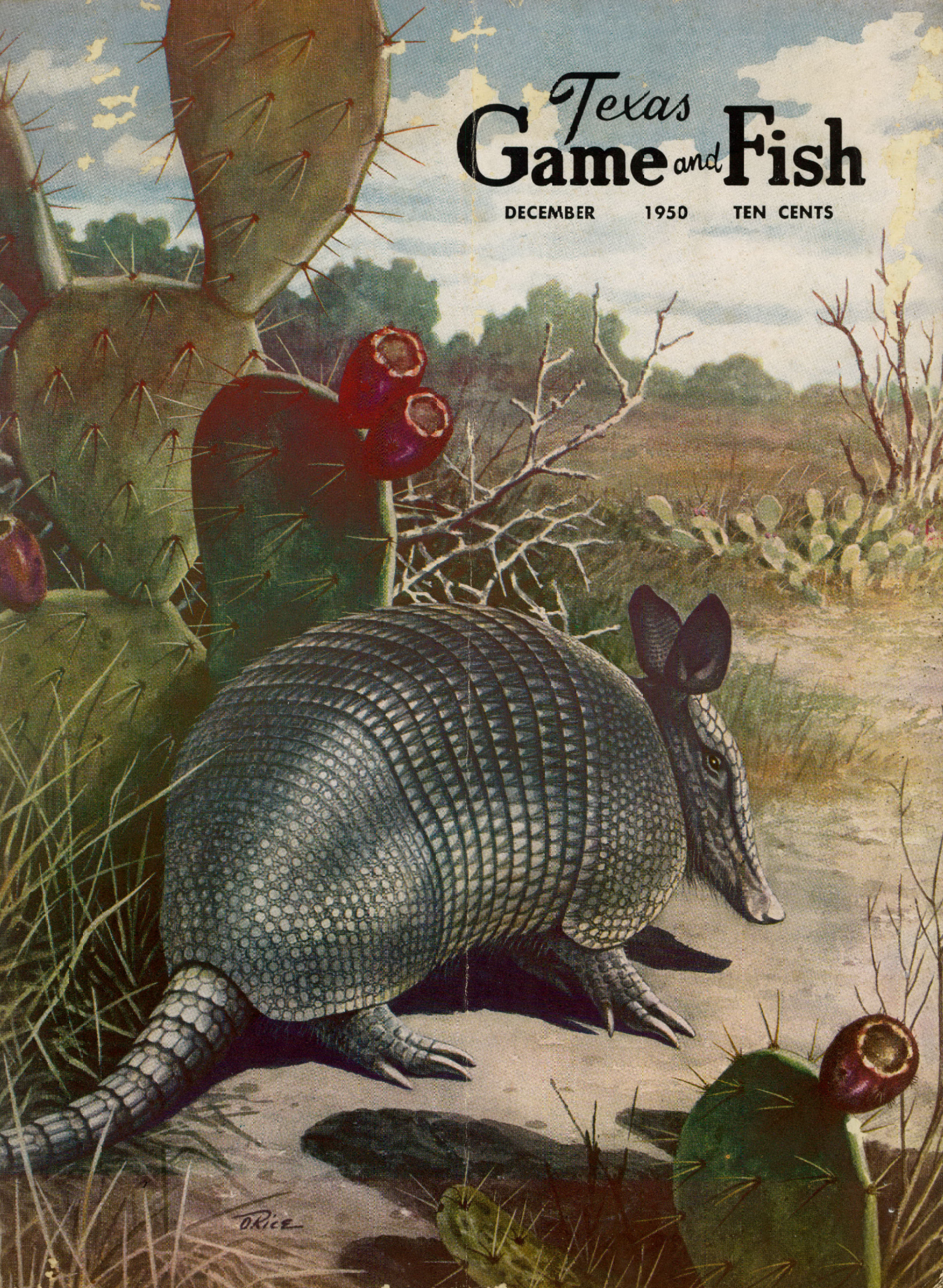


# Texas Game and Fish

DECEMBER

1950

TEN CENTS



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PICTURE OF THE MONTH



# Texas Game and Fish

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

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TEXAS GAME AND FISH is published monthly by the Texas Game, Fish and Oyster Commission. Subscription price \$1.00 per year. Single copies 10 cents each.

TEXAS GAME AND FISH regrets that it cannot continue subscriptions beyond date of expiration. Checks and money orders should be made payable to STATE GAME, FISH and OYSTER COMMISSION. Editorial and Advertising offices, Walton Building, Austin, Texas. Entered as second-class matter May 19, 1943, at the postoffice at Austin, Texas, under the Act of March 3, 1879.

Postmaster: If undeliverable, please notify TEXAS GAME AND FISH on form 3578-P at the Walton Building, Austin, Texas.

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COVER—By Orville O. Rice


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**ROBERT G. MAUERMANN**  
Editor



## The Cover

The nine-banded Armadillo is a strange little mammal originally found only in extreme south Texas and south of the Rio Grande. However, its range has been steadily extended eastward and now includes Louisiana and Mississippi. This little armor plated animal likes brushy cover, soft soil, and an abundance of ants and insects. Many casual observers have blamed them for destroying quail and turkey nests, but little evidence of this can be found. Since some ants destroy quail and turkey nests at hatching time, Armadillos may be more beneficial than harmful.

# Tips on Wild Turkey

By

EUGENE

A.

WALKER

*Wildlife Biologist* \*

THE opening of the hunting season on November 16 is an event which is anticipated with extreme pleasure by thousands of Texas nimrods. A portion of these hunters are dyed-in-the-wool deer slayers, while the greater majority look forward to bagging both a fat buck and a wise old turkey gobbler "with 12-inch chin whiskers." It is conceded by many experienced hunters that it is much more difficult to bag the wild gobbler in his native habitat than to bring home some venison and a hat rack.

Texas turkey hunters are fortunate in that there are more wild turkey in this state than in any of the other forty-seven. The latest statewide survey of wild turkey numbers in Texas was made in 1945 by field personnel of the Texas Game, Fish and Oyster Commission. The results of this survey indicated that there were between 97,000 and 105,000 turkeys in the state at that time. Of this number, between 64,000 and 70,000 were reported from the Edwards Plateau area, which is the principal turkey hunting region of the state. In that section of the state the wild turkey continues to maintain its numbers in pastures under good protection and favorable conditions of range, and where sane hunting practices are in effect. Although sharp periodic fluctuations in wild turkey numbers occur, they appear to be directly related to years of drought and those of normal rainfall; the numbers of turkey receding rapidly in dry years, and increasing just as rapidly in favorable years. The present overall trend shows a gradual increase in total numbers in the past ten years.

This article deals primarily with a few interesting facts concerning the life history and general behavior of our Texas wild turkeys. In addition, an attempt is made to explain the best methods of distinguishing between hens and gobblers in the field. Each year, a considerable number of hunters shoot hens which they believed to be gobblers and others pass up good shots at young toms because they can not be sure of the sex.

Three races of wild turkeys formerly occurred in Texas. Of these, the Merriam or mountain turkey disappeared from the Guadalupe Mountains many years ago. The eastern turkey which occurred in the big tim-

bered area of eastern Texas is gone, so far as hunting is concerned. Only a few scattered bands are reported from widely separated points in deep East Texas. The Rio Grande Turkey (*Meleagris gallopavo intermedia* Sennett) is the race which occurs in the Live Oak Belt of South Texas, in the Edwards Plateau and in practically all of Texas where wild turkeys are found in any numbers. This race presently supplies the wild gobblers for hunters' guns. What, then, is the nature of this great game bird which so justly deserves the reputation of being one of North America's wildest game species?

Wild turkeys normally appear in the largest flocks during the late fall and winter months, when hens and gobblers are observed flocking separately. In the late fall, hens and young of the year may be seen together, the young including males and females. Old toms at this time flock by themselves in groups ranging from three or four up to about twenty birds, nine to twelve constituting an average flock. At the same time flocks of hens including as many as forty to sixty individuals may be common in well populated turkey range. In late winter the young toms of the year normally separate from the hen flocks, and are commonly observed in straight flocks including no hens and no old gobblers. These flocks of young males remain fairly stable through the breeding season. Turkeys during the winter months usually inhabit the rougher terrain of a given turkey range, particularly along stream courses in relatively heavily wooded areas. In such places, food, water, and roosting sites are more plentiful than on the uplands at this time of the year.

Acorns, when available, make up a large percentage of the fall and winter diet but may be supplemented by various berries including some of the sumacs, the hackberry, and the cedar berry. Winter greens are taken along with any beetles and grasshoppers which may be present. At this time, and particularly in late winter, the fruits of both the common prickly pear and the tassajillo cactus or turkey pear, are consumed in quantity where these species have not been removed as the result of clearing programs.

\* Leader, Federal Aid Project 37-R.



Two fine gobblers, easily identified by their size, color, and body contour.

In the late winter, usually in the latter part of February, the turkeys begin to move out from their wintering area. Gobbling by the males is common in early morning and late in the afternoon. As the hens scatter over their nesting range in the grassy uplands, the old toms join them. Soon after, each old tom will accumulate a harem of from three to seven or eight hens, depending on the ratio of old breeding toms in the population to the number of hens present. Yearling toms apparently do not mate. These groups spread out and each group occupies a small block of range. Nesting begins in April and May and the average clutch is approximately eleven eggs which hatch twenty-eight days after incubation begins. The peak of nesting activity usually occurs in May and June, when the greater portion of the young are hatched. During laying, each old gobbler ranges in a very restricted area, and is visited each day or second day by the hens in his harem. He eats very little at this time, depending for nutrients on a fat pad behind his crop, which was built up from rich foods such as acorns, during the fall and winter. As the nesting season nears completion, the old toms begin to gather in small flocks. In late

summer, hens and young combine to form their own flocks. When the first northers come in the fall, usually in October, the drift back to the wintering area begins, and is usually completed by the middle of November.

This behavior of wild turkeys results in the occupation of a large block of range by any one given flock. The distance from wintering areas to nesting areas was found to be eighteen and one-half miles in one specific instance, and it is suspected that even greater seasonal movements are common. These normal movements from winter range to summer range are factors which complicate turkey management. In order to efficiently manage any game species, it is necessary to have an area sufficiently large to include their year-round range. In the case of wild turkey, any area less than 20,000 acres is probably too small.

Blocks of fifty thousand acres are often necessary in sections where the quality of the range is only moderately good.

With these characteristics of our native wild turkey in mind, let us consider the best means of securing that Christmas gobbler. As our Texas hunting laws provide for the taking of gobblers only, the average hunter,

in order to have the best chance of success on his turkey hunt, must be able to make this determination with dispatch, or sacrifice a good shot, or perhaps shoot a hen for which he will later be prosecuted.

There are several characteristics of color and body shape which make it an easy matter to distinguish between hens and gobblers in the field. Many hunters believe that a gobbler always has a beard, while a hen has none. This is entirely false. Many young gobblers, hatched in June, have no beards by the following November, while bearded hens are common (ask one of your buddies who has accidentally shot one).

The first thing to look for in determining whether your target is a hen or a gobbler is color. The feathers of the neck and breast of the wild gobbler have a jet black border, which gives the bird a much darker, more glistening appearance than the hen, which has a white fringe of the same feathers on neck and breast. The color of the hen is more subdued and may even appear mottled when observed rear at hand. These markings can easily be compared in the accompanying photographs.

• Continued on page 28

# The WHY of Migratory

(Editor's Note: Presented by Dr. Clarence Cottam, before the annual meeting of the International Association of Game, Fish and Conservation Commissioners, Memphis, Tennessee, September 15, 1950, and also before a meeting of the Texas Wildlife Federation at Wichita Falls.)

FEW of us in the conservation fraternity sigh with nostalgia when the conversation turns to the great duck kills of several decades ago. To thousands of gunners, that age of waterfowl slaughter stands out as the period of "good hunting." It would be wonderful, we readily admit, if those great flights of waterfowl still filled the sky during their fall migration. It would be wonderful, we agree, if we were thus enabled to provide better hunting for the million-and-a-half additional hunters that we have today over and above the number of nimrods of even a few years ago. We all know, however, that the inordinate kills of the "good old days" can never again be permitted. Indeed, I believe that further restrictions ultimately are inescapable unless more effective public support and sportsmen's cooperation are forthcoming.

A great many hunters can remember the time when the daily legal bag was as much as 25 birds—or at least 10 birds, as in the 1930's and early 1940's. These hunters have not become reconciled to the present limitations.

"Why," they clamor, "must our daily bag limit be set at such a low figure as four, five, or six birds? Why are we not permitted to hunt earlier and later in the season? Why are we restricted to a miserly 35, 40, or 55 days—when we used to hunt for 60, 70, or even 90 days, or all winter? Why can't we hunt after sundown? Why is baiting outlawed? Why can't we zone a state? Why do we have to suffer a reduction of days when we choose a split season? Why can't we use live decoys?"

The "why's" of our hunting regulations seem to be the burning questions of the day. The answer is obvious when we understand the problem facing us today—a problem arising from the marked decline of waterfowl populations and a marked increase in hunting pressure.

Waterfowl and most other wildlife have always receded before the pressure of an expanding civilization. Human occupancy of the land, with its cultivation, drainage, lumbering, grazing, pollution—all these and many other factors have cut deeply into wildlife habitat. During the recent National emergency, the cultivation of more land was intensified and the deforestation of our watersheds was accelerated. Our increasing human population and the growing needs of a people desirous of an improved standard of living inevitably will bring about still further destruction. It is manifestly impossible to continue to reduce waterfowl habitat and still maintain waterfowl populations at a level that will permit extravagant hunting.

The loss of habitat has been the primary cause of the decline in waterfowl populations. Less habitat is available for the production of waterfowl; there are fewer areas in which the birds can find sanctuary and respite from hunting pressure; and there is less and less marshland to provide sustenance for the migrating and wintering flocks. Drainage in America has been excessive and continuous. At present, we have nearly 90 million acres of our land in organized drainage districts and another 50 million acres in unorganized drainage enterprises. In the past eight years, with government subsidy or help, some six million acres of land have been drained; yet, during the past 20 years the Fish and Wildlife Service and conservation departments of our 48

states have together restored less than 4½ million acres of waterfowl habitat. A similar trend in the destruction of waterfowl habitat has occurred in the agricultural belt of the Canadian prairies. At the turn of the century there were approximately 3½ million acres under the plow. Today there are upwards of 50 million acres in agriculture, and much of the rest is under heavy grazing. With such destruction of habitat, it is surprising that we have as many waterfowl left as we have at present.

By CLARENCE COTTAM

Aside from the destruction of habitat through competition or conflict with other economic interests, the problem of wise waterfowl management has been intensified by the growing popularity of the sport of wildfowling. After the war, workers had increased hours of leisure and higher wages, soldiers had come home determined to enjoy the fruits of their victory and to put to use their newly acquired knowledge of the use of firearms and ammunition. As a result, more and more hunters joined the ranks of the wildfowlers. Hunting, as a recreation, was played up by advertisers, sportsmen's organizations, and game departments, and the increased sale of guns and shells was accompanied by an increased sale of duck stamps. In recent years over a million more hunters than during the prewar period bought duck stamps. In fact, in a little more than a decade, four persons were gunning for ducks where only one was hunting before.

With fewer ducks and four times as many hunters, it is inevitable that the apportionment of the supply means fewer birds per hunter. This is a simple bit of arithmetic and the most obvious reason for the *why* of the pres-

There's a Marked Decline of Waterfowl Populations

# Waterfowl Regulations

ent waterfowl regulations. Most state administrators face the same problem in even greater degree in the management of upland game. The basic reason for all regulations, whether they be concerned with strictly local or with migratory game, is to gear the harvest to the production surplus.

By authority of the laws of the United States, under the terms of the conventions with Great Britain (Canada) and Mexico, the U. S. Fish and Wildlife Service is charged with the responsibility for managing our water-

Assistant Director,  
Fish and Wildlife Service,  
Washington, D. C.

fowl resources. Provision is made by law—as it should be—for hunters to take the harvestable increase whenever that increase is sufficient to permit hunting without endangering the breeding stock. What the harvest should be, and in what manner and at what times it should be taken, must be determined by the Service, which works in close cooperation with the states.

As the Fish and Wildlife Service is charged by law with the preservation of our waterfowl resources, any harvest by hunters must of necessity be based upon the annual increment and a long-term consideration of the population. Production and harvest must be so geared that each year there will remain an *adequate* capital stock of breeding birds. In preparing the regulations for any season, the Service must consider the probable supply for the following year, the next 10 years, and the next 50 years. To proceed otherwise would be an abuse of a public trust and a breaking of faith with posterity. Within the limitations of providing annually for an adequate breeding stock, it is the duty of the Service to make the regulations as liberal as the supply will permit. Fur-

thermore, the public has every right to expect that any harvest will be taken on as equitable a basis as natural factors of supply, distribution, habitat, climate, and necessary administrative restrictions will permit. Here again we see the *why* of the waterfowl regulations. Working in cooperation with the States, the Fish and Wildlife Service determines the status of waterfowl, and then recommends suitable hunting regulations for the United States, because only a Federal agency can administer laws pertaining to a National and mobile resource—a resource held in common by all the people rather than by those of a few clubs, a single state, or even by those of a group of states.

From the point of view of those who must enforce regulations to conserve this national resource, the problem of public relations is greatly complicated by the progressive but continual loss of waterfowl areas. Although the flights of ducks and geese are dwindling, when viewed on a long-time basis, our incomparable network of good roads and constantly moving human population cause the birds to be seen now by more people than ever before. As the marshlands and potholes are drained, the waterfowl are forced to rest on rivers, lakes, and reservoirs near human habitations. Moreover, because too many of such areas have little or no food for the migrating birds, they must forage on adjacent crop lands—thereby giving rise to serious problems of depredation. Thus, with more birds being seen, an increased amount of damage being done to crops, and these occurrences being given more and more publicity, the result is a great clamor from the sportsmen for an increased kill and longer seasons.

We cannot yield to the demands of special-interest advocates, nor to those of sincere but unqualified “experts.” If we err, we must be certain that our

error of judgment favors the continuance of wildfowling as a source of recreation for future generations of Americans.

It is difficult to know just where to draw the line between the *how* and the *why* of the waterfowl regulations. You all know how the Fish and Wildlife Service spark-plugs the great cooperative surveys that serve as the basis for the waterfowl regulations. You know how the various state game departments and the Dominion and the Provincial Governments of Canada, and private agencies including the Wildlife Management Institute, Ducks Unlimited, and private clubs cooperate with the Service in gathering information for the winter inventories or for the detailed quantitative reports of production on the summer breeding grounds. With the advice of the cooperating organizations, the Service interprets the information obtained through these surveys, and then makes its recommendations.

In recommending regulations that permit an equitable harvest of the increase, the Service must, of course, first determine the population trends of the waterfowl in the different flyways. If the increase is sufficient, the hunter should be permitted to take more birds—either through an increased bag, a longer season, a longer shooting day, or by a combination of these and other measures. Obviously, a decrease in waterfowl necessitates more restrictions.

In the management of waterfowl on a flyway basis, due consideration must be given both to waterfowl population densities and to hunting pressure. Unfortunately, this invariably leads to some difficulties, for the simple reason that the average hunter is heartily in favor of good conservation for everyone except himself. The average hunter approves of flyway management as long as his state is granted the most liberal regulations. As soon

and a Marked Increase in Hunting Pressure



A concentration of ducks along the Texas Coast, one of the most important wintering grounds in North America.

as a neighboring state receives more liberal regulations, however, he charges the Service with discrimination. Obviously, there is some overlapping between flyways and particularly near the boundaries of flyways in the northern tier of states; yet, in considering broad belts, the flyway concept is biologically sound. It is based on the information obtained from banding more than a million waterfowl.

When pointing out some of these difficulties, we might look first at the Atlantic Flyway, which, during the 1949-50 season, had 20 percent of the birds, and where 12 percent of the nation's hunters took 12 percent of the nation's waterfowl kill. This flyway is a huge funnel, its birds coming to the Atlantic seaboard from vast regions in the Canadian sub-Arctic and from many of our northeastern and Lake States. As the mouth of this funnel is in the Chesapeake Bay area, vast numbers of ducks and geese are concentrated in the State of Maryland during a large part of the hunting season. Because of this, many Maryland hunters have come to believe that the waterfowl resource is inexhaustible, that the ducks and geese they see

are *their* ducks and geese to hunt and kill, and that a miserly limitation of four ducks in the daily bag is the spiteful dictates of "chair-warming bureaucrats." As a result of this attitude and the attitude of a few courts, it has been very difficult to enforce the regulations—particularly as to baiting—in much of the Chesapeake Bay area.

It has been virtually impossible to convince some Maryland hunters that hunting by baiting cannot be allowed because the practice would result in an inordinate kill—not only in Maryland, but in every other state which certainly would also demand the right to use bait for decoying and holding ducks. If baiting is to be permitted in Maryland, it must be permitted in other states—and this, incidentally, a majority of the sportsmen in our country will not tolerate. Maryland gunners also forget that if baiting were permitted in Maine and New York, for example, more birds would be held in the north where they would be inaccessible to Maryland hunters—and might be killed by late fall and early winter storms. The over-all effect would be disastrous, as we learned when baiting was permitted.

The Mississippi Flyway, of course, offers still other perplexing problems which must be considered when regulations are formulated. This flyway is like the Atlantic in that it had approximately 20 percent of the waterfowl wintering in the United States during the past winter season. Unlike the Atlantic Flyway, however, the Mississippi Flyway had 43 percent of the nation's hunters who took 46 percent of the waterfowl killed in the United States during the 1949-50 season. In other words, with only slightly more than 20 percent of the birds, the hunters in this flyway accounted for nearly 50 percent of the national bag of ducks and geese.

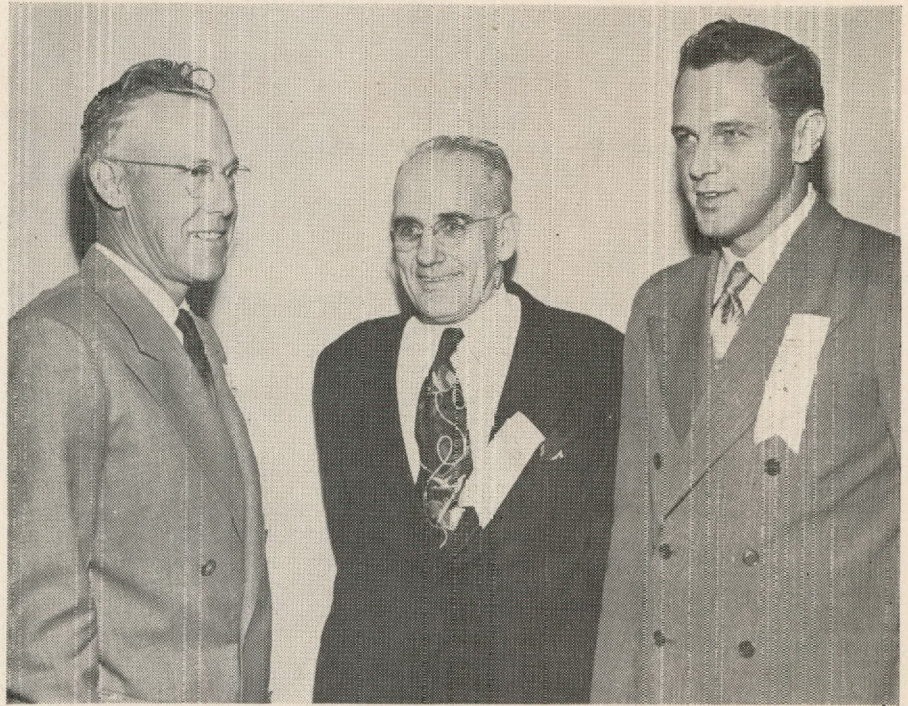
This tremendous hunting pressure makes it necessary—unpleasant though it is—to place restrictive measures on the hunters of the Mississippi Flyway, and this explains why the Service is at present being charged with discriminatory regulations, by sportsmen and some of their leaders in Minnesota, Illinois, and Louisiana. It is mandatory, however, that in this flyway the length of season and the daily bag and possession limits be set at a relatively low figure in order to reduce the excessive kill. Although it is true that the daily bag limit is low and the season shorter than that of any other flyway, nevertheless the daily bag and season still compare favorably with those set by most of the states for the various species of upland game birds over which the states have sole jurisdiction. For example, in 1949, Illinois hunters were permitted to take two cock pheasants a day, with a possession limit of four in a 15-day season. Ohio hunters could take two pheasants per day; while Minnesota hunters, in from about five to fifty percent of the state, had to be content with a daily bag of three pheasants, three sharp-tailed grouse, or three Huns, and they were granted a very short season. The season was closed on some other of their upland game. I am not criticizing these state regulations, as they undoubtedly were just and equitable. They are given to show by comparison that all regulatory agencies—federal and state—must attempt to gear harvest with production, and must consider both hunting pressure and the harvestable surplus that is available. They show



that the problem of boundaries is equally as perplexing to the states in regulating hunting of non-migratory game as it is to the Federal Service in managing the migrant species.

In the Central and Pacific Flyways, where there are the large States of Texas, California, and Montana, there is a great deal of agitation to split these and other States into different hunting zones. Considering only the local or state problem, this attitude is easily understood. Local sportsmen can present a logical case for the dividing of such states as California, Montana, or Texas—or, coming eastward, Missouri, Illinois, New York, or New Hampshire, where there is constant demand for zoning. But, if some states are granted zones for waterfowl hunting, it will be almost impossible to refuse the requests of other states for zones that would be based on county lines, drainage districts, or an "area bounded on the north by Highway 6, on the east by the Red River, south to MacQuarry's fence, thence westward to the Turnpike." Even Delaware, with only three small counties, has been so insistent in her demands to be zoned that her Congressmen and Senators have introduced several congressional bills to force the Service to recognize in effect two great States of Delaware. It will be obvious that zoning a state has the effect of materially lengthening the shooting season in that state, as neither the state nor the Service can prevent the hunters from migrating from one zone to the other in that state, and thereby enjoying a double shooting season. It definitely favors the wealthy sportsmen. Such a privilege granted one state logically would be demanded by all other states. The major objection to granting that privilege is that the supply of waterfowl will not permit it. Furthermore, it is discriminatory against the average hunter of low or moderate income. From a national viewpoint, it is obvious that zoning would increase the kill far beyond what annual reproduction could permit. Consequently, the Service has been compelled to refuse these requests.

In the last few years, since it has become necessary to reduce the season to periods ranging from 30 to 55 days, the Service has permitted each



Pictured in the center is Dr. Clarence Cottam, the author, who recently spoke on the duck situation to representatives of the Texas Wildlife Federation at a meeting in Wichita Falls. To the left is Loy Brown, president of the Federation, and to the right is Roger King, president of the Northwest Texas Field and Stream Association which sponsored Dr. Cottam's visit to Texas. (Photo by Hal Swiggart.)

state to determine its own season within a framework—a continuous period or two shorter equal seasons—within a 92-day period extending from about October 6 or 7 to about January 6 or 7. Thus, within the over-all period or framework set up by the Service, each state has been enabled to adjust the time of the harvest as closely as possible to its own conditions and requirements. The purpose of the framework, of course, has been to achieve some degree of continuity among the states, and thereby to prevent an excessive kill, and to equalize, in so far as is possible, the hunting privileges enjoyed by people living along the border of a state and by those living in the interior.

The Service has been compelled to insist that certain adjoining states have the same season. By way of illustration, it may be pointed out that Arkansas, Louisiana, Tennessee, and Mississippi have in common the Mississippi River as a boundary line. Because of the meandering river, portions of one state are often encircled by portions of another, and exact boundary lines are not always known. In fairness to the hunters of each state, we have felt that here we must

insist upon reasonable uniformity of season in these four states.

Staggered seasons, with rest days between days of hunting, would be popular in many quarters. Large clubs, especially, would like to see a season in which two or three shooting days per week were authorized. The staggered season was put to a test in 1934-35, when 30 shooting days were provided in a season of two or three months (whichever the state selected). The kill of waterfowl during those 30 days was as great as the kill during a 70-day season of continuous shooting in a year when more hunters were in the field and the bird populations were much greater. Because it is well known that larger bags can be made after "rest days," we must deny requests for a staggered season—in the interest of the waterfowl resource and the future of wildfowling.

The use of sun time, instead of clock time, has obvious merit in designating shooting hours. The use of sun time reduces the complications of time zones and daylight-saving time, particularly along a broad and indefinite belt between time zones. Local papers usually print the clock time of sun-

• Continued on page 31

# The Texas Oyster Situation

By B. B. BAKER, JR.  
*Marine Biologist*

THE decline of oyster production in Texas is perhaps one of the best examples of man's exploitation of a natural resource. Seven to ten years ago approximately a million gallons of this fine shellfish were harvested throughout the bays of this state. Today, only a few thousand gallons are produced. Basically it is a case of more oysters being harvested than can be replaced through natural propagation. However, many factors other than

over harvesting have reduced the oyster producing capacity of our Texas waters. For an understanding of the problem, it would be well to discuss a few of the basic ideas concerning the oyster.

Oysters, in the literal sense of the word, are "stuck," and except for a very short period in their early lives, they must remain attached to the bottom or on some solid object in the water. They grow in many varieties

of shapes from those nearly round to long, slender misshapen specimens. Also they may be found singly or in great clumps or clusters.

This shellfish produces great quantities of eggs, but due to adverse environmental conditions and their many natural enemies, very few reach maturity. The eggs are ejected into the water during the warmer months when the water temperature is above seventy degrees, and for a very short time, the tiny larval oysters are suspended in the water currents. Eventually, they must attach themselves to some solid object of which there is a great variety (e.g. tin cans, posts, rocks, old shoes, wire, glass, etc.) but ordinarily they attach themselves to another oyster shell.

An oyster's growth is rather rapid at first, and in some instances a shell has reached the length of 3½ inches in a year or less. Along the Texas coast, it normally takes around three years to produce a good marketable oyster as against four to five years on the Atlantic Seaboard. Exactly how long an oyster lives is not definitely known, but it is probably from ten to twenty years.

The oyster is preyed upon by a wide variety of animals. In Texas waters, its worst enemy, besides man, is the oyster drill or conch, a snail-like animal, which rasps a hole in the shell and feeds on the oyster. Other enemies are several species of crabs, boring clams and sponges, mud worms, and drumfish.

Barnacles and mussels compete with



Market oysters showing young oysters attached to shells.

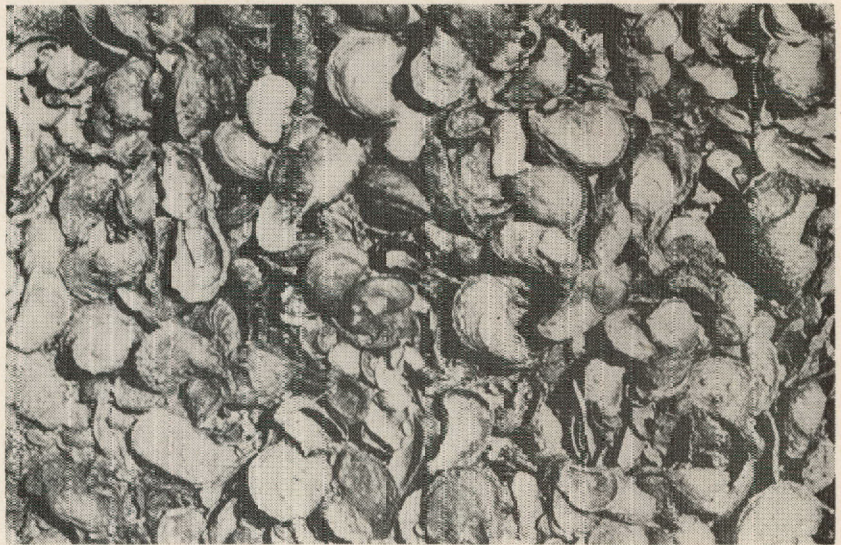
oysters for food, and if they are present in any great quantities on the reefs, they can affect the growth of the young oysters. Floods, hurricanes, and hydraulic dredging can cause havoc with oyster reefs by depositing quantities of silt and mud which smothers the shellfish. Though oysters can tolerate fresh water for a short period of time, reefs around large river mouths are often destroyed during periods of heavy flooding. From this brief description of oyster enemies, it can be understood why it is necessary for this animal to produce hundreds of thousands of offspring in order to maintain the population.

For centuries oysters have been considered a delectable seafood, being consumed in every manner from the raw state to fancy dishes created by the world's outstanding chefs. Nutritionally, oysters provide a considerable quantity of protein, essential for muscle building. Their mineral content (calcium, iron, copper, and iodine) is as high or higher than the content in beef and milk. This seafood is also a good source of vitamin A and has a relatively high vitamin B content. Contrary to popular belief, oysters are not poisonous to eat during certain months of the year; actually it is just that during the summer months, breeding conditions reduce the flavor and appearance of the meats.

Oysters feed upon the microscopic plant and animal life suspended in the water and can become infected with disease bacteria. Typhoid is an example of this. Fortunately there are stringent laws in most states prohibiting the use for food of oysters taken from polluted waters.

Although the Texas oyster is not of the type which produces commercial pearls, often pearl-like structures are found in the shells. These are found in the same manner as true pearls but are usually odd shaped, discolored, lacking luster and are valuable only as a curiosity.

The Texas Game, Fish and Oyster Commission's Marine Laboratory at Rockport as a part of its research program has undertaken to investigate the life history and production of local oysters. Oyster production on the Atlantic Coast is a highly developed and

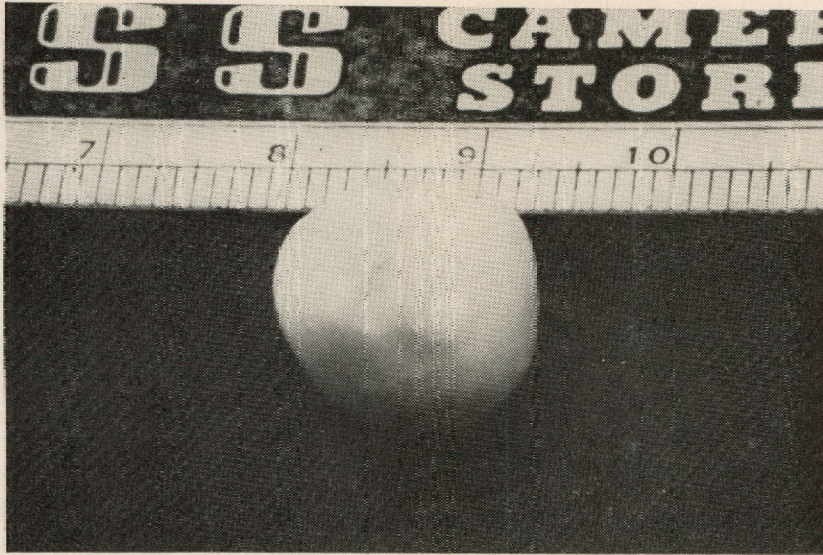


An example of the appearance of a good oyster reef (above), showing adults, attached young, and broken shells. Below is a dredge boat with a load of seed oysters for transplanting.

lucrative industry which is based upon cultivation of leased bottom. Various locations are used to grow the oysters in their different stages of development. Oystermen often have difficulties with trespassing by "oyster pirates." Many states have severe penalties for violation of the private leases, thus protecting the growers' investments. Similar systems of cultivation have been established in other Gulf Coast states and in the Pacific Northwest.

In Texas, for all practical purposes, there is no oyster cultivation on a major scale. There are a number of small leases in our bays but to the

author's knowledge none are managed to produce a significant crop. Essentially some of our bay bottoms appear to be ideally suited for the cultivation of oysters and with our long spawning season there is a satisfactory supply of young to maintain the crop. Due to the rather high water temperature and shallowness of Texas bays, a number of factors need to be examined in reference to possible methods of cultivation. To accomplish this, a number of experimental beds have been established in the vicinity of Rockport. These beds were planted with "seed" oyster (oys-



Above is a "pearl" found in a Texas oyster. To the left, bags of shell cultch used in collecting young oysters.

broken off the cultch and spread over a selected growing area. Some growers place them in wire trays to produce a select crop.

During past years, the Game, Fish and Oyster Commission has followed the policy of restocking natural reefs with seed oysters taken from areas where there is little market production. This procedure has not proved too successful for the transplanted oysters were removed, in some cases illegally, as soon as they reached market size, thus permitting only a few individuals to benefit from the plantings. This left the reefs in no better condition than before they were restocked. This method of replenishing the natural stock has been replaced by investigations to determine suitable methods of commercial cultivation regarding our oysters and their environment. Also under consideration is the replenishment of existing reefs by deposition of suitable cultch material.

At present, commercial cultivation of oysters in Texas is hampered by several restrictive laws. One prohibits the leasing of any more than one hundred acres of bottom to an individual which limits any large scale enterprise. Another law provides that no lease can be transferred; therefore an individual cannot sell his lease or deed it to his heirs. An oyster claim cannot be located on a presently producing bottom which, if it were possible, might enable responsible growers to cultivate reefs far in excess of their natural production. The Commission has recommended that these laws be modified so that there is more incentive for private enterprise to increase our oyster production.

There are probably four main reasons for the tremendous decline in our production from the natural reefs. Unrestricted harvesting by oyster dredges is a major factor in depletion of the beds. These dredges not only pick up all marketable oysters but the seed stock and shell cultch as well. Although our laws limit the minimum depth at which a dredge may be operated, some unscrupulous individuals have cleaned off excellent shallow water reefs. Also, laws are established which provide that undersize oysters be returned to the water. Unfortu-

ters not over a year old) to observe the effect of various types of bottom upon growth and reproduction. To date, these beds have not produced an appreciable quantity of marketable oysters; however, this was somewhat anticipated because in several locations, unfavorable bottom was chosen to observe the degree to which this environment could be utilized as a producing area.

The most satisfactory method of producing a continuous supply of market oysters is by spreading cultch for the attachment of young oysters. This technique is used in the areas of

major oyster production. This cultch is generally shell placed in wire bags over the bed. In some instances, tile or egg crate fillers are dipped in a lime-cement mixture and stacked in the water. A great many substances have been tried as cultch, but where it is available clear oyster or clam shells seem to be the most satisfactory media for attachment of the spats. Many shells have been examined at Rockport which contained large numbers of recently attached young oysters. Generally, after the young oysters are large enough to handle without harming them, they are gently

nately enforcement of this law is often difficult, and many oysters are brought ashore to die. Since our present laws provide that market oysters shall not be opened on the boats, a considerable amount of damage results in that the reefs are deprived of cultch for the attachment of the young oysters. In some areas industrial and municipal pollution has made reefs non-productive either by actually killing the oysters or rendering them unfit for consumption. The effect oil well drilling in our bays has had on oyster reefs is questionable, although extensive research is being done on the subject by the A. & M. Research Foundation. Many reefs have been destroyed by floods and storms and others have been gradually covered by silt.

It is apparent that Texas' oyster production can no longer be dependent on the natural reefs and beds in our bays. Therefore, to place this seafood on a comparable level with other fisheries, commercial cultivation is the only answer. Much is still to be learned about oysters and their production in Texas waters. Potentially, however, the bays of this state are capable of supporting an oyster industry and in years to come, under sound management and production principles, Texas can rank with the leading oyster producing areas of this country.



"Coon" or "Snapper" oysters generally found in mud bottom.

## LEAD SHOT PELLETS HAVE MANY USES

THE tiny lead shot pellets that spell Fall to millions of duck hunters spend the rest of the year glamorizing Hollywood stars, performing humanitarian duties in hospitals, helping radio send chills up your spine, catch fish, clean silverware in restaurants, are used in the counterbalance of scales and serve in many other useful and ingenious ways.

Lead shot pellets are made by streaming molten lead through a perforated pan that jiggles the pellets into drops that form into spheres before they strike water 154 feet below. In the Winchester shot tower they travel more than 1,000 feet during manufacture before they are loaded into shot shells. From a shot shell they fly on an average of about 120 feet to hit a duck if the hunter points his

shotgun straight.

While performing their extra curricular duties, shot pellets travel in the very best circles. Evening gowns worn by Hollywood stars have shot pellets sewn into the hemlines to make them hang more alluringly. In hospitals bags of shot are used to provide traction in healing broken arms and legs. The counterpoises of scales contain shot. Larger sizes of shot are used as sinkers on fish lines.

Mark Twain invented another use by having the "Stranger" fill a frog full of shot so he couldn't jump in his story about the jumping frog of Calaveras County. Modern radio sound effects men roll shot on drum heads to simulate the rumble of cannon and drop them on inflated bladders to imitate thunder or the roar of the surf.

Nor is this all by a long shot. During prohibition homebrewers cleaned beer bottles with shot. Druggists do the same today and restaurants clean silver the same way. Working models of boats frequently use shot as ballast and textile finishing plants tumble samples of cloth in soapy water with shot pellets to simulate wear in "laundering" tests.

Shot is used in the cowboy's quirts and in the policeman's blackjack and in children's toys in which they must be jiggled into holes or through a complicated labyrinth. In olden days quill pens were kept in a container of shot. Today's most popular container for shot is the conventional red shot shell and when the wild fowl begin to fly, shot pellets will be keeping them close company.

# Murrell L. Buckner State Fish Hatchery

By JOE MARKS

*Engineer and Director of Hatcheries*

The desirability of a fish hatchery in the vicinity of Possum Kingdom Dam was recognized several years ago by the Game, Fish and Oyster Commission. Therefore, steps were taken to investigate a suitable site for the location of a hatchery in that vicinity in 1948. A thorough investigation of all possible sites was made in cooperation with the Possum Kingdom Game and Fish Association and with officials

of the Brazos River Conservation and Reclamation District. The site finally selected was located on the east bank of the Brazos River directly below Possum Kingdom Dam and contains 102.86 acres of land. It is approximately three-fourths mile long and one-fourth mile wide on State Highway 16, about fourteen miles southwest of Graford, Texas.

Bids for the construction of the

fish hatchery were called for and a contract for this work was let on February 14, 1950. Work was started immediately and construction was completed on July 1, 1950. Forty-four ponds were constructed ranging in size from one-fourth acre to three acres. These ponds are supplied with water from Possum Kingdom Lake by means of a ten-inch cast iron pipe line and are drained through concrete outlet boxes into a concrete drainage ditch into the Brazos River.

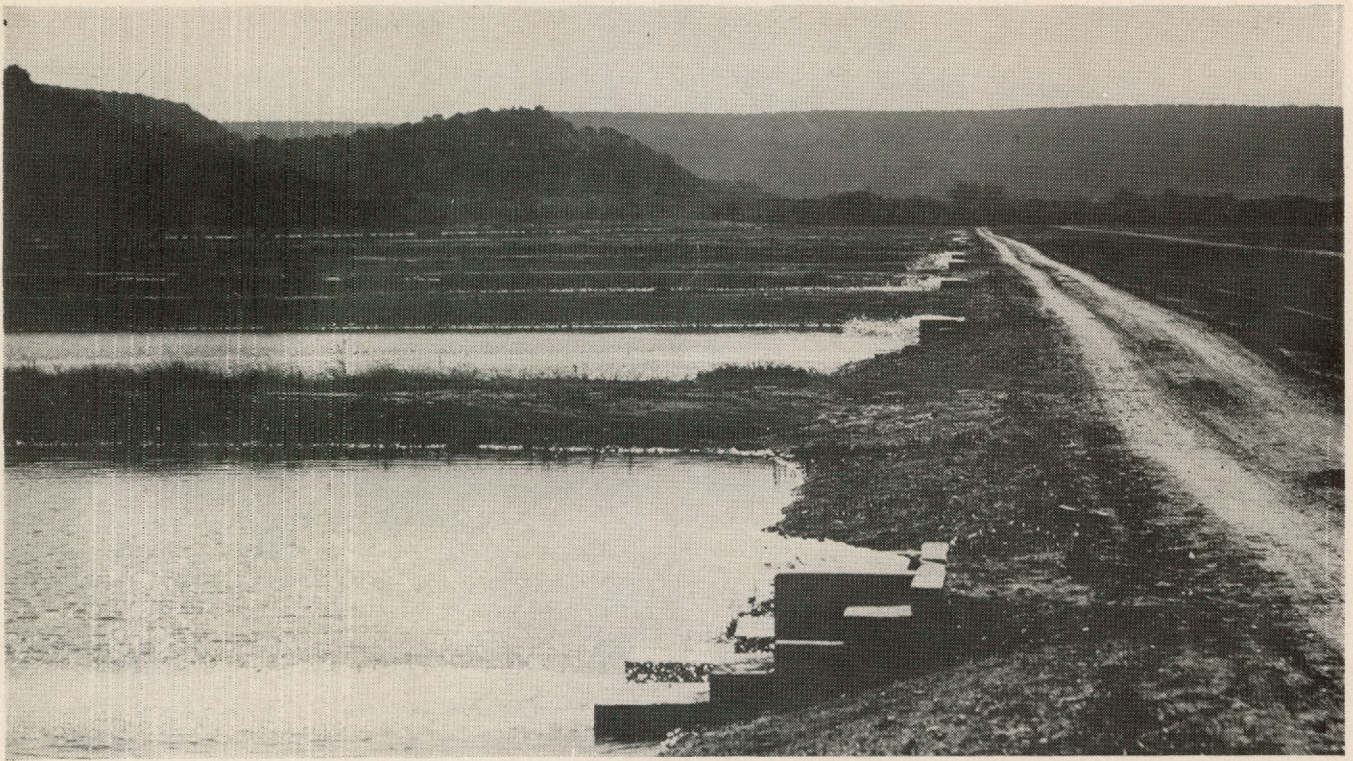
A superintendent's residence and two for his assistants together with a warehouse-garage comprise the buildings for the hatchery. The contract for this work was awarded on May 3, 1950, and completed in September, 1950. The residences are of frame construction and have asbestos siding. The warehouse-garage is of hollow tile.

The hatchery was placed under the direction of Harmon Henderson, formerly superintendent of the San Angelo State Fish Hatchery. Plans call for the propagation of largemouth black bass, bream, crappie and channel catfish. The hatchery will stock the waters of Clay, Montague, Jack, Wise, Palo Pinto, Parker, Erath, Hood, Somerville, Hamilton, Bosque, Lampasas and Coryell counties in North Central Texas.

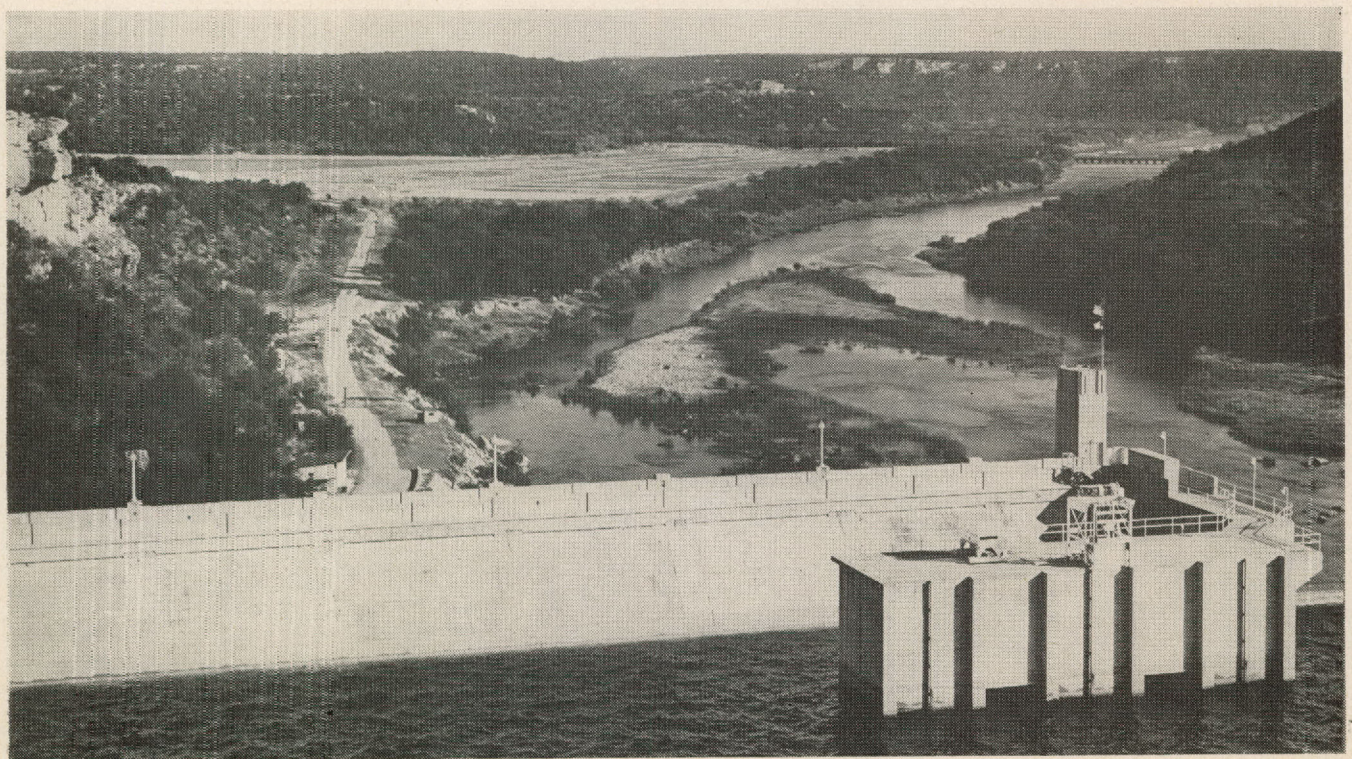
The hatchery was named the Murrell L. Buckner State Fish Hatchery at the Game, Fish and Oyster Commission's special meeting in Mineral Wells on September 22, 1950, in honor of Murrell L. Buckner of Dallas. Mr. Buckner served as a member of the Game, Fish and Oyster Commission of Texas from 1929-1935 and 1937-1941 and as chairman from 1941 to 1949.



Harmon Henderson, superintendent of the new Buckner hatchery, drains a brood pond.



A few of the hatchery ponds are being filled prior to stocking. To the right are residences for the superintendent and his two assistants, with the warehouse garage unit in the rear. Below, in the center background, is the entire Buckner Hatchery. It is bordered on the right by the Brazos River; in the foreground is Possum Kingdom Dam. It is seen from the observation point above the dam.



# Hunter, Check Those Sights!

By H. C. LAWSON

**H**ERE are two little tales of woe about a couple of hunters who through sheer carelessness learned a lesson they will never forget.

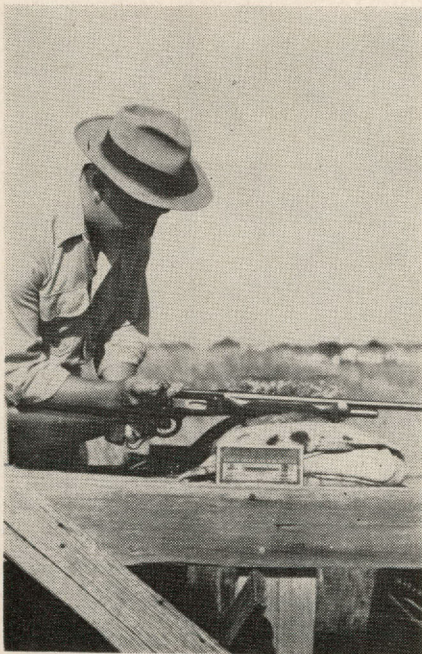
A few years ago my father and I had packed into the Sierra Madre in the state of San Luis Potosi in Mexico for our annual hunt, and had been confined to camp for almost a week by a spell of rainy weather. Finally, on about the fifth or sixth day, the clouds lifted a bit, the rain stopped, and the sun broke through. I eagerly saddled my mule, stuck my rifle in the scabbard and took off in quest of game.

Not more than a quarter of a mile from camp I rode up on the best whitetail buck I've ever seen in thirty years of looking for them. I cautiously got off the mule, and missed that buck four times at a range of sixty-five paces. He was standing broadside, and never moved until the fourth shot, when he trotted off with his dignity preserved and every hair intact and in place.

Now, we really needed that venison, and I surely wanted those horns! My rifle was a .351 Winchester in perfect condition; I had used it for years and was thoroughly acquainted with it, or so I thought, but right then I had to control a wild impulse to wrap it around the nearest oak tree. Subsequent targetting at the distance at which the deer was missed showed that the rifle was

shooting over a foot high and some eight inches to the right. Then I saw the light. Just before leaving on the trip I had installed a new gold bead front sight to replace the plain blade with which the rifle was equipped at the factory. I had assumed that just because the new sight seemed to be in the center of the slot and about the right height that all was well, and that sighting in was unnecessary. I learned a basic lesson the hard way, but I still didn't have that trophy buck.

The second of the incidents took place in Gillespie County some years later, and illustrates another cause for missing and wounding game which is often overlooked. A hunting partner and I left camp about the middle of the afternoon and were walking together to our stands. My friend was an excellent hunter, distinctly above the average as a marksman, and on this particular day was carrying a beautifully kept .32-40 Winchester rifle. His rifle was equipped with a new 'scope, a good one, which we had mounted ourselves shortly before the opening of the deer season. And we had sighted it in carefully with standard velocity ammunition. We walked upon a nice buck which was standing facing us at a distance of forty-eight steps. My friend took the shot, calmly and unhurriedly, aiming, as he said later, at the white spot under the buck's throat. At the report of the rifle the buck



Steve Heyward, Jr., of Cleburne, adjusts the rear sight of his rifle with a screwdriver.

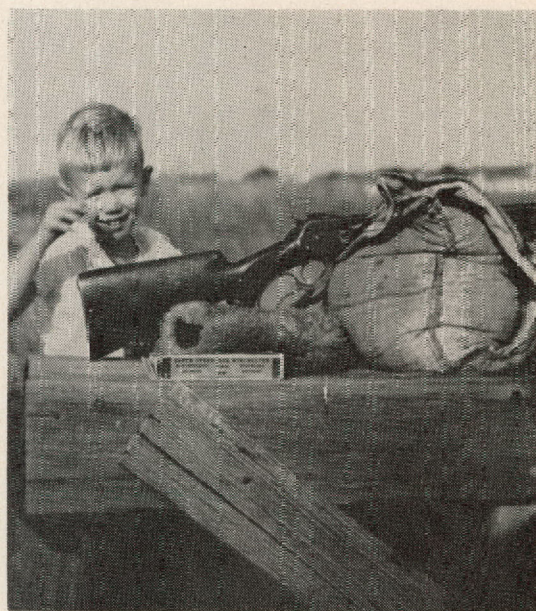
To the right, he adjusts the front sight with a brass drift and small hammer. The rifle action is open!







Heyward demonstrates the proper bench rest position.



Three-year-old Scott Lawson, son of the author, is pictured beside his hunting rifle.

whirled and was gone in the cedars, absolutely untouched, and a small cedar limb fell to the ground from a spot a good foot above the aiming point.

During our discussion of the situation immediately after this happened I picked up the empty brass cartridge case, glanced at the base, and the reason for the miss was readily apparent. The cartridge had been of Remington manufacture, and was plainly stamped ".32-40 H.P." He had shot at that deer with the high velocity cartridge, whereas the rifle was sighted for the standard velocity number, and the 500 f.p.s. differential in muzzle velocity, along with some other factors, had caused the bullet to fly at least a foot high at fifty yards. A later check proved this point.

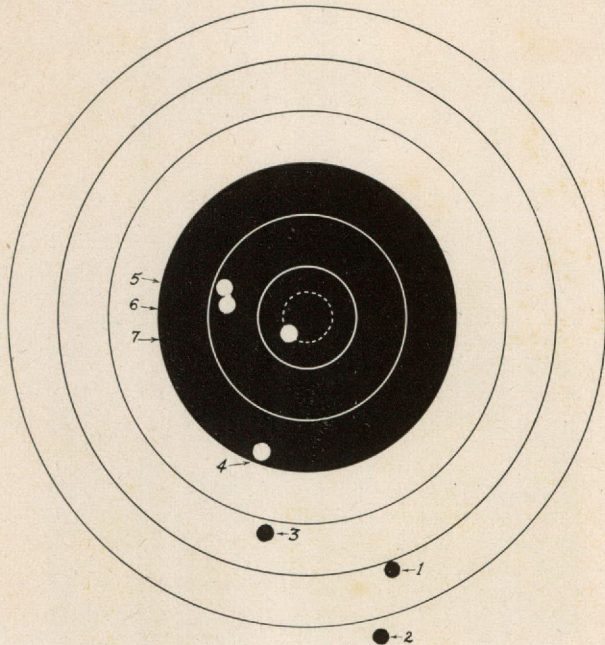
There was one good thing in common with these happenings, and that was that both bucks escaped unscathed and the only harm done was to the hunter's feelings, which soon recovered. However, in either case, a badly wounded animal could easily have been the result of the hunter's carelessness and thoughtlessness, and it would seem that the moral of the above experiences would be to always sight your rifle in carefully with the ammunition you expect to shoot, and stay with that particular ammunition.

This matter of correct sight adjustment and proper

cartridge selection is very important indeed, and if you will show me a man who is a consistently successful deer hunter I'll show you one who makes sure that these factors are well taken care of before he goes hunting.

Too many of us are prone to place all the blame for a missed or poorly placed shot on our rifle or cartridge. If there is any doubt as to the efficiency of our equipment, why take it afield? Why spend a hundred dollars, or more, on a deer hunt, in addition to losing a week's time from the job, unless you are sure that your gun is right?

There is nothing mysterious about the art of correctly adjusting rifle sights. It can be a lot of fun, too. The only thing to remember is that you must move the rear sight in the direction in which you want the bullet to go, or move the front sight in the opposite direction. You must raise the rear sight to raise the point of impact of the bullet on the target, or you can lower the front sight to obtain the same result, and vice versa. The only tools needed are a short drift made of some soft metal like brass or copper to move the sights in their dovetail slots, a light hammer to do the tapping, and possibly a small file to use on the rear sight notch or elevator. Most aperture rear sights like the Lyman and Redfield can be adjusted with the fingers or a coin, or a properly fitting screwdriver, likewise the scopes.



This target illustrates the results of the properly sighted rifle. The shots are numbered from first to last and show where the rifle was shooting before and after the adjustments. Heyward started adjusting after the second shot and continued to do so after each shot with the exception of number 5. Numbers 5 and 6 were fired with the same setting, and with number 7, he brought it into the X ring. All shooting was at 100 yards.

In sighting a hunting rifle with precision, it is well to remove the human error in aiming as much as possible, so a steady rest of some kind is a prime requisite. The best of all is a bench rest, or shooting table, and if you have access to one of these you can really turn out a first class job. However, a blanket rolled up to provide a cushion for the forearm and placed over a box, log, or even a good sized rock will suffice. You must do the actual shooting yourself, for no one else can correctly sight your rifle for you. It is an established fact that a rifle which is correctly sighted for one man is seldom right for another, for we all differ in eyesight, exact shooting positions, manner of holding the rifle, and so forth. Shoot from the prone position, and remember to have the forearm well cushioned, for a rifle will almost invariably shoot away from any hard object against which it is rested, thereby defeating the purpose of the whole thing. Assuming that you have chosen your range, that the target is placed against a *safe* backstop, and you are comfortably arranged at the firing point, the next thing is to carefully squeeze off a couple of shots. If you hold the squeeze properly these two shots will tell you just where your rifle is shooting, and you can then make any necessary sight adjustments. Make a slight adjustment, shoot a round, then make another if necessary. If you do your part in aiming,

holding, and squeezing, you'll be pleased and fascinated when you see your group crawling into the bull's eye as the sights are finally brought into the proper position. And when you get them set, mark them in some manner so that you can tell at a glance that they are as they should be.

You are now ready to leave the rest position and shoot from any position which you might find necessary in hunting, with the full and comforting knowledge that a poor showing is your fault alone, and not that of the rifle. From a standpoint of our Texas brush hunting it would be a good idea to "stand on your hind legs and shoot like a man" as the grand old man of American gun-making and shooting, Harry Pope, so aptly remarked. If a hunter were limited to one box of twenty cartridges for a season's hunting it would be far better to expend ten of those cartridges in carefully checking his sights, five more in shooting at the same target from the offhand position, leaving the remaining five for the hunt, than to take the full box into the hunting field with the assumption that the rifle was correctly tuned up. If you do your part as a good hunter should you might be surprised at the number of times you will come home with two bucks and three cartridges left, and no unpleasant memory of a buck wounded and lost through sloppy work on your part.

Any of the various types of expanding bullets as loaded by our large ammunition companies will be found to be entirely adequate for our Texas deer. The important thing here is to select one of them and stick to it faithfully. Some rifles are so sensitive to changes in the fodder which is fed to them that they will shoot to different points of impact with cartridges of a different brand, even though bullet weights and types are the same. A little experimenting will quickly show just which cartridge the individual rifle likes. That is the one to settle on right then and there, and don't be tempted to make a change without carefully checking the results.

So much has been written about the best rifle and cartridge for white tail deer that very little could be added here. It seems to be pretty well established that most anything from the .25-35 up will be found satisfactory. I have personally seen deer taken with this calibre, as well as with most existing calibres even up to the .375 magnum, with never a failure that could rightly be attributed to the rifle. I've seen plenty of dismal failures, though, that could be charged directly to the hunter, and as many of these were due to neglect of proper sighting and careless substitution of bullet weights and velocities as were due to the ineptitude of the hunter as a rifleman.

So, let's give the deer a break. Our whitetail buck is a gentleman in every sense of the word, and the grandest game animal on this or any other continent. If we must kill him we should strive by all means to do it cleanly, quickly, and in the most sportsman like manner possible, with a rifle of ample power which is adjusted to do the job properly. And if we fail to kill him in his tracks let's hope above all else, that the shot is a clean miss, and that the hunter will place the blame where it belongs. If the rifle didn't shoot where it was looking it's still his fault!

## CANADA GEESE

The Common Canada Goose, the largest of the five sub-species of *Branta canadensis*, is the most widely distributed and best known of our North American waterfowl. In size, the Greater Canada is second only to the swans and the vanishing whooping cranes. It has a wing spread of between five and six feet. Some specimens are reported to weigh up to eighteen pounds; however, most adults of this species weigh between seven and fourteen pounds.

Because of its great size and wariness, the Canada Goose has fascinated sportsmen as much or more than any other game bird in North America.

The well-known honking announcing the presence overhead of the compact V-shaped formations winging their way to and from their northern breeding grounds, is familiar to the outdoor enthusiast from the Atlantic to the Pacific and from the Gulf of Mexico to the Arctic Coast.

Whether grazing on land or swimming in water, these gray-brown geese are easily identified by their long black necks and white cheek-patches. The fidelity of the Canada Goose is a singular characteristic, for unlike ducks and other waterfowl which seek a new mate each year, the Canada Goose mates for life. It is said that when one of a pair is killed, the survivor will never remate.

The Canada Goose usually nests near the water. The nest is sometimes a depression in the ground and other times it is a bulky affair. But usually, it is lined with material such as sticks, grasses or soft grey down that can be gathered from the nearby vicinity. The average number of eggs laid is five or six, but it varies from four to ten. The period of incubation is from 28 to 30 days. Even though the gander never sits on the eggs, he is always near and in readiness to protect his family if danger arises.

The Common Canada Geese become restless at the first signs of approaching spring and show this uneasiness by congregating in flocks and by constantly gabbling and honking. Finally a flock or two mounts into the air and the journey northward is begun. Their greatest movement is in the month of March. Then September sees the birds once again restless and gathering in large numbers along the coasts for the trip southward. Their greatest movements during this migration are through the month of October and the first half of November.





RICE



# Wild Geese Calling





A large flock of geese flush from marsh ponds as a hunter approaches his blind. Left, R. K. Cumberland and H. L. Daughters, Kingsville, display their limits of Hutchins geese plus an additional Snow goose. Texas goose hunters found that their favorite sport provided many thrills and lots of good hunting this year.



Denny Beckner, Comfort, awaits the approach of a flock of Snow geese, hoping to add to his bag. Below is a typical scene of Texas goose hunting, grain field style. Below, W. E. (Bill) Cumberland, Kingsville, and Beckner remain covered and completely motionless in the semi-dugout blinds until the geese are within shooting range.



# Our Bird Friends

By C. E. CHAMBERLIN

(Editor's Note: Articles by Mr. Chamberlin on common Texas birds will appear in subsequent issues of TEXAS GAME AND FISH. Excerpts from the following article were published in the SAN MARCOS RECORD.)

THERE is always something new and interesting about the study of bird life. The study has been a popular pastime of many people, and since the time of Plato, bird lovers have been placing their observations on permanent records. It would seem that in all that time everything of interest would have been written, but each added article may induce someone to look about him and to take a new interest in a worth-while activity.

A smile and a song go together. If one has a song in his heart he will carry a smile on his lips. We are told that it takes the use of more than fifty muscles to produce a frown but only about fifteen to make a smile, so "smile again" and be happy. Someone said, "eat, drink, and be merry for tomorrow ye may die." I would say, laugh, whistle, sing, and be happy and thus you shall live on forever. I believe that happiness should be the main pursuit of life. If that be true, would it not be wise for all of us to give more attention to the study of birds and to learn their secrets of happiness?

Beautiful pictures, good music, and fine poetry are given to us as inspirations for the finer things of life and thus to make our lives more wholesome. I do not believe that one can produce the finest of any of these arts without an appreciation of the wonderful things of God's creation. The flowers, the trees, the snow-capped mountains, the white-cap waves, or a beautiful Texas sunset are the works

of the Great Artist. The bird is the finest thing of all his creations.

No one can enjoy a harmonious relationship with his friends and neighbors unless he understands and appreciates their language, knows their names, and something of their secrets. An understanding of the things of nature may make us better able to understand our friends and neighbors.

There are over 13,000 different species of birds in the world. There are more than 800 species in North America with some 400 more occasional visitors. Many states claim from 400 to 500 different forms. Texas claims about 540. Many of these birds are living all about us, yet how many do we know, even by name? We may know the names of a few birds but may know very little about their home life or about their economic and esthetic value to mankind.

Birds are more than mechanical machines. They possess and are controlled by an intellect which makes them interesting objects of study. They show this intellect in their love-making, their nest building, in their bird language, and in many other ways.

In speaking of birds, Goethe said: "While men their woes must suffer and are dumb, a God gave me mine to utter in song." Birds are living symbols of happiness and song. Perhaps it would be wise if we gave a closer study to our bird friends who live about us most of the year and thus learn something of their secrets of happiness, enjoy their singing, and thereby be able to live more happily with our friends and companions.

This is a mechanical age and we are living in a troubled time of that age. Might it not be well if sometime

we step aside from the busy turmoil of worldly affairs and to think for a while about the more pleasant things of life? Birds are the harbingers of happiness. Their lives parallel our own lives in so many ways and are so filled with incidents similar to our own that it should fascinate any of us to learn more about them.

The extension of a knowledge of the finer things about birds has caused more appreciation of their esthetic and economic value. The birdlife of any community is a priceless inheritance of the people of that community and everything should be done that can be done by the people to preserve the existence and safe keeping of such a valuable asset.

The study of bird life in any community leads one into a study of the history of birds, the classification of birds, the migration of birds, the courtship of birds, the relation of birds to mankind, and to other important features of bird life. Space does not allow for a detailed study of each of these phases but we shall endeavor to call attention to some of the more important things of the study and, in a general way, show their important relation to mankind.

Most of us do not have the time nor the desire to make a scientific study of birds. Such a study may well be left to the professional ornithologist. All of us may, however, with a little patience and an earnest desire to become better informed about our little neighbors, learn their common names, some of their songs, and much about their home life. A close study will enable us to distinguish sparrows from wrens, wrens from warblers, and to recognize many individual species.

***They Perform Many Services For Mankind***

Individual species of birds like individual people have peculiar mannerisms in their flying, feeding, hopping about in the trees or branches, and in their songs. Of course, I do not mean to infer that individual people hop about in trees or fly, but if they did those things, such mannerisms would be very individual. You may ask, how am I to learn about these characteristics. There is just one good answer. Get a good bird-guide book and notebook, some field glasses, and get out among the birds and observe and make notes. Soon you will know many of the birds by their names and how they live, and as your interest increases (which it will with your increased study) you will be able to recognize these birds.

Little realized by many is that there would be little hope for mankind were it not for the chief enemies of the insects and rodents, the birds. The entomologists tell us that there are about 7,000,000,000 known and classified insects. There are, perhaps, 2,000,000,000 more which are not classified. Each year, there is a great loss to agriculture due to these insects; it has been estimated that rodents and insects destroy over 500,000,000 bushels of grain stored in bins alone.

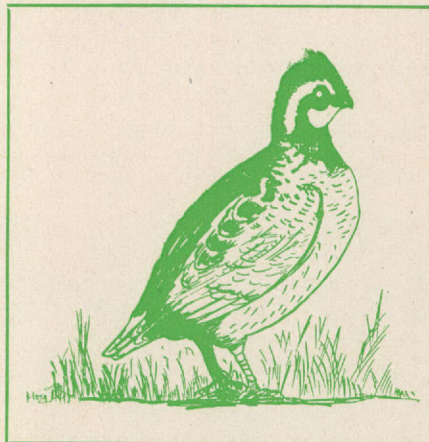
There would be still greater losses if it were not for the birds which keep

The owl destroys mice, rats, and snakes and eats the carcasses which would otherwise pollute the air.



down the number of insects and rodents. For instance, a single plant-louse may produce as many as 100 young in a season. Her young mature so rapidly that there may be thirteen generations each year. The offspring of the twelfth generation alone, should they all live and multiply, would, according to the late E. H. Forbush, former State Ornithologist of Massachusetts, number over ten sextillions. Or, as he very graphically has expressed it, the twelfth brood would form a procession, with ten to the inch, that would reach all the way around the earth and from the earth to the sun and from the sun out into space to a point so inconceivably remote that light

Quail provide food, as well as sport, for man.



from it, traveling at 186,000 miles a second, would take 2,500 years to reach the earth. This same plant louse weighs only a millionth part of an ounce, but if it were allowed to multiply unchecked, and if its offspring all were to find sufficient food to grow to maturity, and in turn bring forth their young throughout the year, it would, in a single season, result in so vast a body of insects that their combined weight would be greater than that of all the people of the United States.

So it can readily be seen that birds serve a very worth-while purpose. Their mission is of wide range and they minister to every taste of mankind. They serve the sportsmen in season, and the singers delight a still

The Marsh hawk, as he glides through the air searching for food on the ground below him, is a familiar sight to outdoorsmen.



greater number throughout the year. Perhaps the farmer benefits more than others from the service rendered by the birds. They consume tons of weed seed and destroy countless numbers of insects which if allowed to live would make life impossible for every other form of life. A member of the U. S. Biological Survey has estimated that on every acre of ground, birds destroy an average of ten cents' worth of insects annually. There are 167,934,720 acres of land in Texas, not counting submerged land. At ten cents an acre for insect-eating, the birds of Texas are worth annually nearly \$17,000,000 to the state. This estimate is undoubtedly too low now.

While character is written in the human face, it is also found in the bird's beak. A grain-eater has a short heavy beak. Insect-eaters have more slender bills, and birds of prey have decidedly hooked bills, and all trades are represented among the birds. The robin is a mason; the woodpecker is a carpenter; the oriole is a weaver; and many water birds are raft makers.

From the grubs which burrow in the soil and cut off the roots of plants to the moths that flutter above the tree tops, there are thousands of different kinds of insects insidiously working and threatening to destroy the grass at our feet, the plants in our yards and gardens, the crops in our fields, the fruit trees in our orchards, and the forest trees themselves. But for each type of insect, nature has devised types of birds to feed upon these

● Continued on page 29

# Junior Game Wardens

HERE is a story of how conservation education works in a South Texas community. About a year ago, a group of small fry hunters were roaming the streets in Cuero, killing birds at random with air guns and sometimes even with 22 rifles.

A far-sighted newspaper man, Harry C. Putman, recognized that a small boy's energy can be directed but never stifled. He believed that by a little adult cooperation the boys' energies could be diverted from mischief into constructive channels. Putman began by enlisting the aid of State Game Warden Charlie Edmondson. Together they rounded up a few of the boys and organized a Junior Game Warden Corps. The first week ten members were recruited.

Each boy was presented a certificate signed by the Mayor of Cuero, the Chief of Police and by Mr. Put-

man as sponsors. The junior grade conservationists received official credentials bearing their names, addresses and descriptions.

The boys took an oath not only to protect game and songbirds but also to report game law violations to the Game Warden.

The idea spread like wildfire. The sponsors were swamped with applications. Youngsters with air guns no longer invaded private property and there were no more reports of boys killing doves or songbirds. At present, there are 65 members of the organization.

When the Game Department requested its field force to assist in a state wide dove banding program, the Cuero Junior Wardens were a natural. Under the supervision of Game Warden Edmondson, 120 young doves were banded just before they

left the nest. When hunters kill banded doves, they are urged to return such bands to the Game Department, since they are needed to secure vital information on these important game birds.

The Junior Warden sponsors realized that they had assumed a real responsibility and that it extended far beyond just preventing a few boys from killing protected birds. The youngsters needed to learn not only some of the basic principles of conservation, but also how to use firearms and fishing tackle. They are learning these things rapidly.

The youngsters who distinguish themselves as wardens of the month are awarded such outdoor equipment as tackle boxes, rods and reels. Several such awards have been made and more are anticipated.

Members of the dove banding unit are left to right, top row: Harry C. Putnam, sponsor of the organization, Donny Kasper, Jerry Kasper, Conrad Horst, Tommy Kennedy, Roy Taylor and Game Warden Charles Edmondson. Bottom row: Ray Hernandez, Bruce Abel, "Buzzy" Powell, Richard Hernandez, Jan Nash and Norman Hanke.



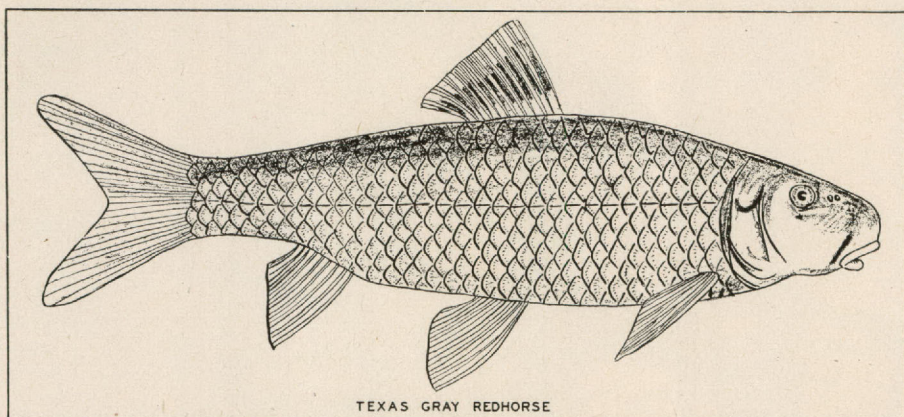


Conrad Horst, Junior Game Warden, scales the topmost branches of a tree in quest of baby doves which he will lower in a small sand bucket to Game Warden Edmondson for banding. To the right, Edmondson bands the baby dove while the others look on.

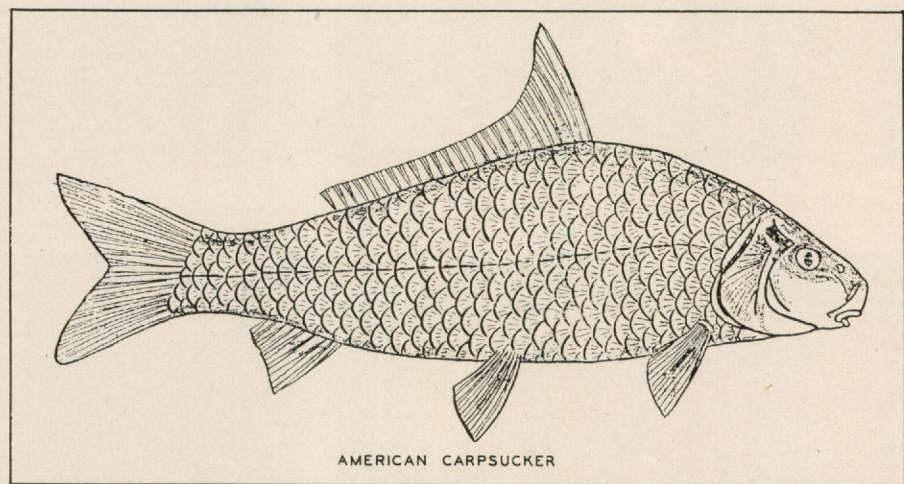


Game Warden Edmondson further instructs the Junior Game Wardens in the proper handling of guns.

# Fishes of Texas



TEXAS GRAY REDHORSE



AMERICAN CARPSUCKER

By **MARION TOOLE**  
Chief Aquatic Biologist

**T**HE carpsuckers and redhorses are two members of the sucker family that are quite prevalent in Texas. Carpsuckers may be found in the Trinity, Brazos, Red River, Colorado, Guadalupe, and Rio Grande drainage systems. Redhorses have been listed as occurring in the Sabine, Lampasas, Brazos, Guadalupe, Llano, Colorado, San Marcos, Rio Grande, and San Antonio Rivers.

The carpsucker looks very much like a European carp at a casual glance. Forbes and Richardson in the *Fishes of Illinois* state that "the name of carp was applied to them by the early settlers of Virginia, although they bear only a general resemblance to the European species of that name." Since the latter as introduced into our

waters, the native species have been called "American carp." These fish are now generally called carpsuckers.

Several species of carpsuckers are to be found throughout the United States, but only one species and one subspecies occur in Texas. They are the river carpsuckers, *Carpionodes carpio carpio* (Rafinesque), and the slender carpsucker, *Carpionodes carpio elongatus* (Meek).

The river carpsuckers are among the largest members of their genus. They sometimes reach a weight of eight or nine pounds. The slender carpsuckers usually weigh about two pounds.

Carpsuckers are easily identified. They have thin lips on their sucker mouths. Their dorsal fins have a long base and the front rays are

elongated, like the buffaloes, and carp. Their color is different, however, from the buffaloes. The scales on the carpsuckers are metallic looking. The European carp have barbels growing from the upper lips at the corners of their mouths. The river carpsucker has a higher back and is more robust than the slender carpsucker.

Little is known about the spawning of these fishes. Since buffalo (October, 1950, TEXAS GAME AND FISH) and carp spawn in a similar way, it is reasonable to believe that carpsuckers spawn in a similar manner also. Spawning dates are variable during the spring months.

These fish feed mainly from the bottom and pick up quite a bit of mud with their food. Mollusks, small insect larvae, small amounts of vegetation, water fleas, etc., constitute their food.

The fact that they consume mud probably causes their meat to be more obnoxious than that of other suckers. The writer caught some from a clear water lake that had been eating dough bait, and persons eating these fish said they had an excellent flavor.

Three redhorses are found in Texas. These are the black-tailed horse, *Moxostoma poecilurum* (Jordan); the Texas gray redhorse, *Moxostoma congestum congestum* (Baird and Girard); and the Mexican gray redhorse, *Moxostoma congestum albidum* (Girard).

As can be seen in the illustrations, the redhorses have a small dorsal fin in comparison to the carpsuckers. All the redhorses are cigar shaped. The blacktail redhorse, as its name implies, has a black tail. This black pigment is in the form of a streak through the lower part of the tail. The other two redhorses do not have black pigments in their tails. The dorsal ray of the Texas gray redhorse is typically twelve-rayed, and that of the Mexican gray redhorse is eleven-rayed.

• Continued on page 30

# The Marine Fishes of Texas

By J. L. BAUGHMAN

Chief Marine Biologist

THE smooth-toothed shark has been recorded from New York (Gunther, 1870), Cuba (Poey, 1875), and Virginia. The most recent records are those from North Carolina (Radcliffe, 1914), South Carolina (Burton, 1940), and Florida and Mississippi (Springer, 1938). It has also been recorded from Africa (Fowler, 1936).

A dried jaw from the Laguna Madre, August 25, 1924 and a female collected at Galveston, Texas, July 7, 1940, are, according to Mr. Springer, who identified the Galveston shark, the only known Texas specimens of this rare shark. However, a third is in the collection of the National Museum. This specimen is also from Galveston; and a fourth is in the Field Museum.

Color, generally slate blue above; pure white below.

The largest so far reported was about 4 feet long but it may grow considerably larger.

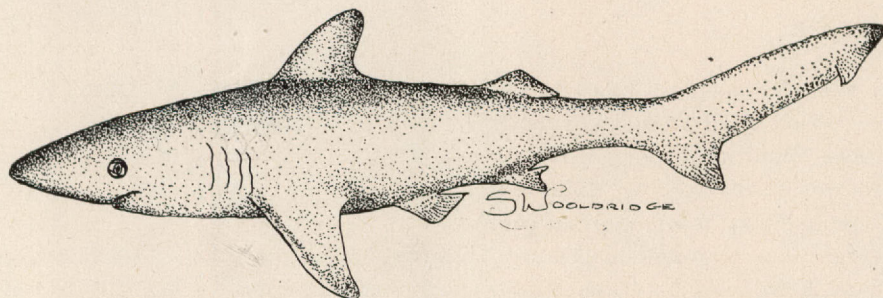
No data are available on its habits and food.

The Lemon shark is found on both sides of the Atlantic; from Brazil and the West Indies north to Charleston and Pensacola, occasionally straying as far as New Jersey (Anon., 1945). It has been reported by Meek and Hildebrand (1923) from Panama, and is known to occur in the Bahamas, and off Cuba and Jamaica.

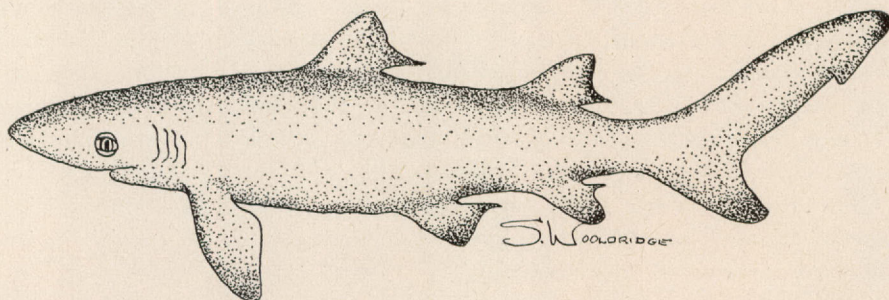
One specimen of this shark was obtained in Lydia Ann Channel, lower Aransas Bay, in May, 1942. This is the only record for the state.

The lemon shark is usually yellowish brown above, but sometimes dark brown or bluish gray with yellowish tinge; white or pale yellowish below, the anal usually yellowish and edged with gray; the other fins with or without dark edges.

\*These articles are abridged from Baughman, J. L., and Stewart Springer, Biological and Economic Notes on the Sharks of the Gulf of Mexico. Amer. Midl. Nat., July, 1950.



SMOOTH-TOOTHED SHARK\* *Aprionodon isodon*



LEMON SHARK\* *Negaprion brevirostris*

This shark matures at about 7 to 7½ feet and grows to a maximum length of about 11 feet.

This is an inshore species common around docks, which it frequents in search of refuse (Breder, 1929). It also frequents creeks and inlets as well as the open coast, where it subsists largely on fish, including stingrays in its diet. It has also been accused of attacking bathers.

Four litters of young were taken in May, at Englewood, Florida, representing 55 individuals.

Rogers (1919) notes that a 95-pound specimen of this shark furnished the following economically useful products:

	Weight	% of Total
Hide (7¼ sq. ft.)	10.5 lb.	11.9
Liver	9.75 lb.	10
Edible Food	29.75 lb.	31.3
Flesh for fertilizer or chicken food	42.5 lb.	44.7
Blood and other fluid	3.0 lb.	2.1

In those figures, the fins were included with the fertilizer. A little

over 3 quarts of oil were obtained from the liver.

Rusoff (1940) examined two livers of this species, each weighing about 20 pounds. Four gallons of dark colored oil were obtained after a three-hour cooking with live steam. The specific gravity of this oil was 0.9118, and the vitamin content amounted to over 15,000 U.S.O.X. 1 units of Vitamin A per gram. This yield is much above the average of Florida sharks, however, for Springer (1944) states that the majority of this species produces oil assaying between 3000 and 11,000 U.S.P. units of Vitamin A. The Vitamin D content is around 35 units.

This shark produces good heavy leather, and all the fins are utilized in commercial operations, while the flesh which Rogers (1919) notes as excellent. Sometimes it is marketed both fresh and filleted.

# *Facts from* QUAIL WINGS

By DANIEL W. LAY

*Wildlife Biologist\**

Wildlife biologists have learned a lot about quail from study of their wings. Small collections of wings examined during the past three winters have indicated that important conclusions are just around the corner. However, several conflicts in wing data can be solved only through the study of larger collections. Quail hunters can help by gathering a wing from each bird they kill, and sending their collection to the Game, Fish and Oyster Commission, Austin, Texas.

Ten small feathers at the base of the primary flight quills tell whether a bird was hatched during the previous nesting season. Also, the molt pattern indicates the hatching date within a two-weeks period, up to 150 days. Thus is determined the ratio between adult and juvenile quail taken during the hunting season.

The juvenile : adult ratio, together with sex ratios (male : female) in both young and old birds, appears to be a simple indicator of the status of the quail population in a given locality. From these data, it may be possible to predict future hunting success. It may also be possible to learn from this source at what season quail were subjected to a significant mortality loss in each locality.

Some 3,500 wings have been checked in East Texas in connection with the work on the Newton County Project. The number of young per adult hen in hunters' bags increased from 5.3 to 11.8 in three years as the general population level increased. Sex distortion increased from 56% males among adults to 59%. The percent of young in the total population increased from 70% to 82%, the latter figure being near normal when compared with records from Missouri and Wisconsin.

From this it might appear that the percent of juveniles and the number per adult hen are directly correlated with population well-being. However, there are inconsistencies between the records of various counties and between the data from East and that from West Texas. It seems that at least 500 wings from one county or region are needed to get a significant sample.

A. S. Jackson, wildlife biologist of the Game Department, reported for the 1948 season when populations were low in western Texas, 75% young, 8.1 young per adult hen, and the extreme adult sex distortion of 69% cocks. If this sample of 306 birds had been large enough

to be considered significant, the logical conclusion would have been that sex distortion among the adult birds was the best criteria of trouble among the bobwhites.

Other records have shown 15 to 20 young per adult hen. These could only be interpreted as samples either too small or populations in which the adult females had suffered very severe mortality after hatching off their broods.

Previous efforts at determining the status of quail or predicting future crops have proved difficult or impracticable. Summer whistle counts have been too inconsistent, data on broods doesn't seem very good. Every summer the common prediction is "more and better quail hunting this winter" because so many broods are noted. Unfortunately, these birds too often disappear before December.

Wings appear to be the best way to get data on the state-wide quail population—and this depends upon the hunters.

A few hunters contacted by game wardens or biologists have helped by saving wings in the past. In spite of the trouble, most of those contacted

were able to save most of the wings they bagged. This year the Department is soliciting state-wide wing collections, hoping that a large mass of data will clear up some of the questions involved.

To facilitate mailing of wing collections, the Department will supply special business reply envelopes on request. These provide space for recording pertinent data, and require no postage from the hunter. The active help of hunting clubs and other groups is being solicited.

It is essential that wings from cocks and hens be placed in separate envelopes, but any number of wings of the same sex may be placed together. Only one wing from each bird should be saved. Date and county of collection are also necessary data. If official envelopes are not at hand, any kind of paper sacks will suffice if properly labeled.

One further bit of information is requested. In order to compare quail populations in different parts of the state, a place on the wing envelopes will be shown for recording the number of coveys found per day of hunting. This also will add to the picture of the state quail situation.

## Wing Collections Are Sent in by Hunters

\* Leader, Federal Aid Project 20-R.





Smokey, cub bear severely burned in a New Mexico forest fire, receives treatment from Dr. Edwin J. Smith of Santa Fe. Smokey is now a resident of the Washington zoo and is dedicated to the school children of America as the symbol of forest fire prevention and wildlife conservation.

# Smokey

**S**MOKEY, a 3-month-old black bear cub who survived a recent forest fire in New Mexico, will spend the rest of his life helping foresters in their campaign against forest fires. The thousands of people who see Smokey in the Washington, D. C., zoo are reminded of the dangers of forest fires.

Smokey was found clinging to a charred tree near Capitan, New Mexico early in June, after a fire had destroyed 10 million board feet of timber and killed untold wildlife in the Lincoln National Forest. New Mexico state game and fish officials, taking pity on the cub, took him to Santa Fe, N. M. There he was treated for third degree burns and nursed back to health on a diet of pabulum mixed with honey and milk.

Almost overnight, the cub became famous. His forlorn expression touched the hearts of millions of readers.

Elliott S. Barker, New Mexico game warden, offered to let the U. S. Forest Service present the cub to the national zoo as a living symbol of the need to be careful with fire in the forest.

At this point, Smokey got his name. He was named for

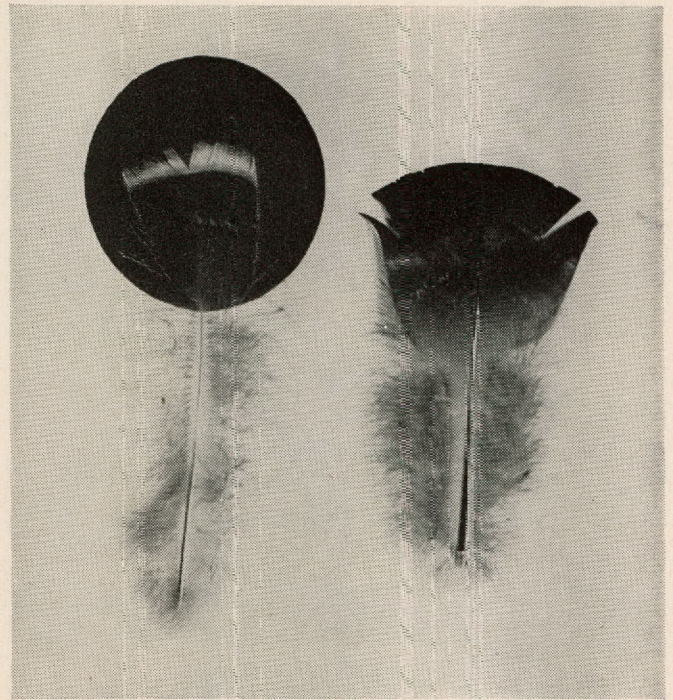
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Smokey and his handler, Homer C. Pickens, assistant state game warden for New Mexico, pose by the private plane before taking off from Santa Fe, N. M.



A group of strutting gobblers provides no challenge to the hunter in distinguishing hens from gobblers.



On the left is a feather of a wild turkey hen as compared to the feather on the right, that of a wild turkey gobbler. The main difference, as is apparent, lies in the white-tipped fringe on the feathers of the hen.

The difference in body shape is another quick way of distinguishing sex. The gobblers appear to have longer legs, longer necks and longer tails than the hens, and the neck and head of the gobbler is larger in proportion to the body than those of the hen. In mixed flocks gobblers can be distinguished from hens by their larger size. It is true that experience is necessary to quickly note these distinguishing characteristics. A binocular or a good hunting scope can be a real advantage in getting a little closer "look-see" before you shoot.

The following tips are listed in the hope that they will provide more shots at gobblers and result in less hens

killed through mistakes or carelessness:

1. Never shoot into a flock of turkeys. Pick your bird and let him get in the clear before you fire.
2. Be suspicious of large flocks of turkeys (twenty or more). They are more than likely hens. This is especially true late in the season but may occur from mid-November to the end of the hunting season.
3. Remember that wise old gobblers are not found in large flocks and that they are old because they are wise. Gobblers two years of age and up do have beards.
4. Never shoot at turkeys in the immediate vicinity of a roosting site. This is an excellent way to drive your game out of the locality.

5. Take time to visit one of your farmer friends who raises bronze domestic turkeys. Study the differences in gobblers and hens as to feather coloration, and body make-up. Take your binoculars and watch them from a distance. The coloration of neck and breast feathers is almost exactly the same as that of wild turkeys.

6. Depend on coloration and general body shape in sex determination of wild gobblers because many fine young wild gobblers have no visible beards, while numbers of wild hens do have beards.

7. Observe closely; be sure you are shooting at a gobbler and try to make a clean kill.

## Smokey

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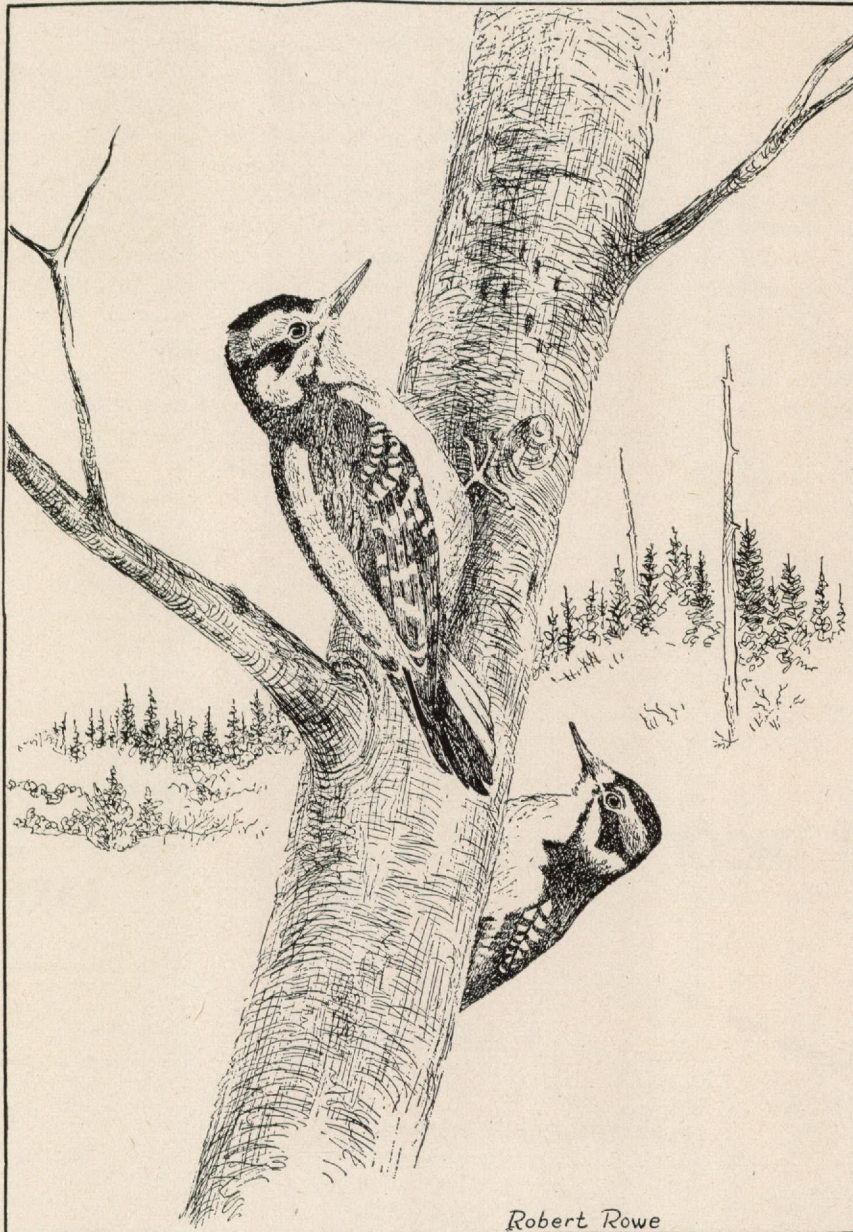
the poster bear used in the forest fire prevention campaign carried on by the Texas Forest Service and the U. S. Forest Service under the sponsorship of the Advertising Council, Inc. He is a live Smokey helping carry on the work of the poster Smokey.

Little Smokey was flown to Washington in a special plane. In a special ceremony at Santa Fe before the take-off, the airplane was christened "Smokey."

Already Smokey is one of the most famous residents in the zoo. He has been on television programs. His pic-

ture has appeared in newspapers and magazines. Hollywood wants him for a movie. But, most important of all, he is making people more conscious of the destructiveness of forest fires.

Civic leaders, school teachers, merchants, and other individuals can obtain Smokey bear forest fire prevention posters and literature by contacting their nearest District Forester or by writing direct to Texas Forest Service, College Station, Texas.



The woodpeckers drill into trees for boring insects.

insects and to keep them within bounds.

Beginning at the ground floor, we have the birds of prey cleaning out the mice, rats, snakes, and devouring the carcasses which would otherwise pollute the air. Also, on the ground floor, an army of birds are at work dragging forth countless enemy insects hidden in the grasses, among the undergrowth, and buried in the ground. The snipe and woodcock probe the loose soil. The larks and sparrows

scratch among the dead leaves and grasses, and the vultures, hawks, and owls destroy the rodents and eat the carrion. In the trees we find the warblers, vireos, and wrens working carefully among the foliage, and the nuthatch and creepers searching the bark of the trees. The woodpeckers and flickers drill into the trees for the borers, and the fly-catchers and swallows guard the air.

In considering their usefulness to mankind, birds may be divided into

five classes:

- (1) Insect-destroying birds—the warblers, wrens, vireos.
- (2) Seed-eaters—sparrows, larks, doves, goldfinch.
- (3) Carnivorous birds—hawks, owls.
- (4) Scavengers—vultures, crows, gulls.
- (5) Game birds—grouse, quail, ducks.

# How Fast Does Shot Travel?

## Fishes of Texas

• Continued from page 24

Members of the "cold stove league," which is made up of the more enthusiastic hunters throughout the country, can always find matters pertaining to guns and ammunition about which to argue, or, at least, converse.

"Yeah, I've read all those figures on muzzle velocities in terms of feet per second, but what I want is the dope in miles per hour. For instance, how fast does a charge of shot travel . . . in words a speed cop would use?" This is a familiar question to members of the sporting ammunition industry.

"When a 12 gauge Remington Express shot load, consisting of 1 1/4 oz. No. 6 chilled shot, leaves the muzzle, it is traveling at the rate of about 950 miles per hour," says Henry P. Davis, public relations manager, Remington Arms Company, Inc. "By the time it has gone 20 yards, it is whizzing along at about 650 miles per hour and at

40 yards it has slowed (?) down to about 525 miles per hour . . . which isn't exactly a crawling gait.

"The speed of other loads may be of interest. A Remington Shur Shot load, powder equivalent to 3 1/4 drams and 1 1/8 oz. of No. 6 chilled shot, leaves the barrel at about 875 miles per hour; at 20 yards it is going nearly 640 miles per hour, and at 40 yards a little over 500 miles per hour.

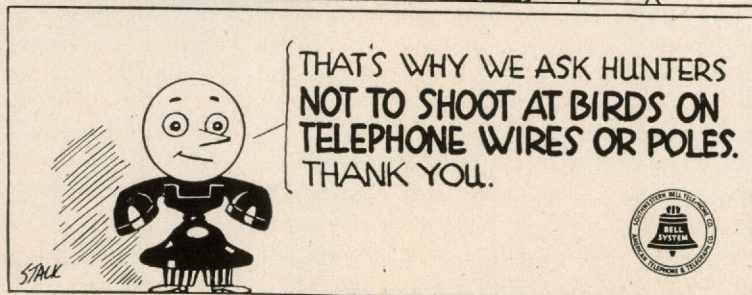
"The standard Remington trap-shooting load, 1 1/8 oz. of No. 7 1/2 chilled shot, is moving over 825 miles per hour when it leaves the muzzle, about 600 miles per hour at 20 yards distant and at 40 yards about 475 miles per hour.

"Skeet loads get out of the barrel at the rate of about 820 miles per hour and at 25 yards, due to the smaller shot (No. 9 chilled), the speed has diminished to around 540 miles an hour, which is still a bit faster than you can throw a rock.

Their food consists of snails, small bivalve mollusks, and aquatic insect larvae.

These fish spawn in the months of April and May. To spawn, they ascend the shallow streams feeding a lake or larger river.

Both carpsuckers and redhorses stay in fairly deep water when found in a lake. Both types of fishes can be caught on dough bait, but should European carp be present, then the angler can expect to catch more carp than carpsuckers and redhorses. Both redhorses and carpsuckers net easily in gill nets and most of these fish that are taken are caught in nets. Neither of these two types are important commercial species, and they never sell for as much money as do buffalo and carp. Their greatest importance is probably like that of the shad, namely, to provide forage food for the bass and catfish. The redhorses (not to be confused with redhorse minnows) are excellent in one respect. Successful catfish fishermen swear by them and claim that they are the best bait for catfish that can be used.



## LAKE OWNERS

If you plan on draining or lowering your lake this winter—spring—or summer of 1951 to remove the undesirable fish such as carp, gar, suckers, spoonbill cat and buffalo—

Write or phone. We have the seines, nets and other equipment to do the job for you. We can go any place in Texas.

**Louis W. Botary**

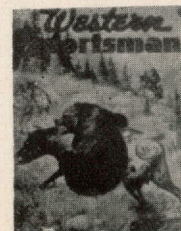
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## The Why of Migratory

• Continued from page 7

rise and sunset, making it easy for hunters to comply with the regulations. If a state within a single time belt desires to choose a specific opening and closing hour, this can be done by prescribing those hours completely within the limits of the sun time prescribed by the Federal Service.

In certain parts of the country, hunters complain about the regulations that prohibit hunting prior to one-half hour before sunrise and later than one hour before sunset. As with other regulations, these restrictions have been formulated more for the sake of the ducks than for the convenience of the hunters. Ducks must eat and rest if enough are to survive to return to the breeding grounds in the spring. Each year, an individual duck may be subject to legal hunting for about six months, beginning early in September in northern Alaska and Canada and terminating in March in Mexico.

All sportsmen worthy of the name learned long ago that it is the hunt—not the enormity of the kill—that is worth while. If a hunter bags three or four birds a day, he has enough for a meal of wild game, and the thrill of a day in the open must be considered in the final reckoning. The average hunter has a season bag in excess of nine ducks, a surprisingly good average. Pheasant and grouse hunters in most states might envy it.

Occasionally hunters send to the Washington office of the Service an account of their hunting expenses. A typical summation shows that the hunter spends about six dollars per duck. The disgruntled hunter usually follows this statement with the remark: "Six dollars for one duck . . . bah!" To these hunters I must point out that the most expensive round or sirloin steak sells for about one dollar a pound, and most other cuts are cheaper—if they want cheaper meat. Hunting game cannot be considered in terms of its meat value only.

Many sportsmen, it is true, recognize the need of further regulation as a means of preserving their recreation and distributing the kill more equitably. With this goal in mind, such well-informed and vigilant sportsmen have advocated that their

states promulgate further regulations that will be compatible with the regulations of the Service. Certainly it is within the powers of any and every state to limit still further the bag and season granted by the Service to that state, and to prescribe further the manner in which waterfowl shall be taken within its boundaries. Thus, where a small group of individuals may be drawing too heavily upon the public shooting grounds in a state, the authorities there may be called upon

### THINGS YOU MAY NOT KNOW

The world's rarest game bird is the Hawaiian goose or "nene." Changes in land use and extra hunting pressure have reduced their ranks to a pitiful remnant of not over 25 or 30 birds.

\* \* \*

While the rhino's defective sight can hardly make out a motionless man at a distance more than 40 or 50 yards, the animal's sense of smell is so keen that it can detect the presence of man a quarter of a mile or more away.

\* \* \*

The pangolin of Sumatra, a member of the anteater family, is clothed in scaly armor so strong that it can resist a revolver bullet.

\* \* \*

The chikarah, an antelope found in India and Tibet, has four horns instead of the conventional two.

to limit the number of trips that any one person may make to those grounds—or to place a more restrictive season or bag on the birds in that state, to require that the birds be tagged, or to take such other measures as may be desirable for equitable distribution of the kill in the state.

The fewer and the simpler the regulations the better. When there is a clamor to liberalize or eliminate any regulation, there is one simple, safe, and effective criterion or yardstick that can be applied to determine the course of action, and that is simply to ask ourselves the question: "Will the supply permit?" Confronted with a request for a longer day or a longer season, an earlier, later, or a staggered season, a larger bag, a zoned state,

baiting, the use of live decoys, or any other measure likely to favor the hunter as opposed to the birds, the administrator—if he is mentally honest—has to apply this yardstick. It must ever be remembered that our waterfowl are a prize national heritage—a renewable resource and a product of our land owned in trust by *all* our people, so that any major liberalization granted for one area, and particularly within a flyway, may logically be demanded for another, and the effect may be cumulative.

The greatest need to insure favorable hunting and fishing privileges—both state and nationally—is for unity of action and an honest observance of the rules of good sportsmanship. If the staggering illegal kill, which appears to amount to one-fifth or more of the legal harvest, could be eliminated and this loss added to the legitimate bag, and *if* the alarming crippling loss which probably equals the loss from illegal kills could be reduced to a minimum through a higher standard of sportsmanship—for example, through stopping shooting out of range or flock shooting, or deliberately spoiling some other gunner's shoot—there would be fewer doubts about the future of hunting and fishing in this country. Certainly the seasons could be materially lengthened and the bag limits increased. *The future of the sport is up to the sportsman.*

The management of this national resource must be conducted on a national basis, spearheaded by one Federal agency but supported by the unity and cooperation of the state and private organizations concerned with waterfowl. The problems of maintaining our waterfowl populations are due primarily to a lack of habitat and the occurrence of unfavorable climatic conditions. Unless and until that habitat can be improved and rehabilitated through the efforts of private and governmental agencies, we must safeguard our waterfowl heritage and protect it by rigid regulations, seasons, and bag limits, and by good sportsmanship and proper management. That is *WHY* we have regulations: to preserve and improve for tomorrow the good hunting that we have today, and to apportion fairly among our hunters the harvestable surplus that is available.



# BOOKS



**WESTERN LAND AND WATER USE** by Mont H. Saunderson. 217 xi pages. Illustrated with nine photographs and one map. Published by the University of Oklahoma Press, Norman, Oklahoma; 1950. Price \$3.75.

This book offers both a realistic appraisal of present land policies as they affect the western lands of the United States and what appears to be a clearly thought-out prophesy of the future. Since the author is an agricultural economist of long experience in the West, he speaks with first-hand authority and offers a fresh viewpoint on major problems of land and water use which beset the West and the nation as a whole.

The western movement of our center of population and the general increase in population have aggravated old problems and brought new ones. In some places irrigation development already has overreached the available water supply; grazing lands, already under heavy pressure to produce more meat and wool, over large areas, have been grazed out of production; speculation in wheat has caused a situation in the southern plains that requires only a prolonged dry spell to give us another dust bowl; and reservoirs are silting rapidly. These abused lands, says the author, are the ones to which America must look in the future if we are to maintain our present standard of living.

Although parts of the present picture seem dark, Mr. Saunderson suggests curative measures which he believes can change the future outlook if they are applied soon. First, he points out the need for a strong national land and water policy taking into full consideration the future needs for agricultural produce, industrial products, forest products, and recreation. A strong educational program must be launched to improve the use of private and public lands,

but regulatory state laws still are needed to restrict the overtapping of ground water supplies, to prevent overgrazing, and to restrict dryland tillage which can lead to disastrous soil drifting.

To accomplish this, he suggests state rural zoning laws, which he feels are essential to protect the public interest from those who would jeopardize it for immediate personal gain. He feels that federal aid similar to that extended to private forestry under the Clarke-McNary and Norris-Doxey Acts and to farmers under the Soil Conservation Act must be extended to embrace private grazing lands. Flood control programs must be rewritten to keep more water in the watersheds through less emphasis on main-stream engineering and more on soil conservation work, reforestation, and balanced grazing.

Although Saunderson calls for a careful balance in all natural resource planning, some of his predictions and recommendations for drainage and reclamation will cause misgivings in wildlife circles. This will be particularly true for those interested primarily in stream fish and waterfowl. On the other hand, there is evident throughout the book a real recognition of the recreational values of wildlife. The author believes that wilderness areas and wildlife refuges must be preserved and expanded and that these areas will grow in value as time passes. In general, the emphasis on wildlife is much stronger than one might expect in a book of this kind.

**FIELD BOOK OF NATURE ACTIVITIES** by William Hillcourt. 320 pages. Illustrated with many line drawings by Francis J. Rigney. Published by G. P. Putnam's Sons, 2 West 45th Street, New York City, New York; 1950. Price \$3.95. A burning interest in the out-of-

doors and an appreciation of its true values are rarely things that spring full-blown when an individual reaches a certain age. Nearly every one of the great careers in conservation and natural science had their beginnings in a hobby of some kind. Some began with fishing, others with hunting, and still others with collections of natural objects—shells, rocks, discarded birds' nests, or pressed leaves. More than one outstanding career had its genesis, to some mother's horror, in jars of pickled snakes reposing in a bureau drawer. There is little doubt that such hobbies tend, unless early stifled by misapplied parental discipline, to grow and develop. As they grow, the hobbyist tends to broaden his outlook and to see the interrelationships between the primary object of his attention and the elements that make up its environment, until the interdependence of soils, waters, grasslands, forests, and wildlife become sharp and clear. When this happens, he is no longer a mere collector and hobbyist, but a true conservationist.

This new volume, by a member of the National Staff of the Boy Scouts of America, is a welcome addition to the G. P. Putnam's Sons field book series. It is a broad approach to the entire field of nature hobbies from bird study through nature photography and the collection of all natural objects. There are clear instructions on scientifically approved methods of making collections, special tips for adding interest and variety to a nature hobby, and suggested references for advanced study. Although the budding naturalist, whether Boy Scout, 4-H Clubber, or Girl Scout, will treasure this book, it is not "written down" to the child and many adults will derive much pleasure from the wholesome hobbies so clearly and authoritatively outlined.

# Rumor vs. Facts

**T**HERMOMETERS are useful instruments. In the case of body fevers, they are good guides to internal conditions. Sometimes, they settle arguments as to how cold it really is on a frosty morning. Rumors are frequently indicators of the extent of interest in some wildlife topic. Unlike thermometers, however, they usually lack correlation with truth.

About two weeks ago, Texans heard that thousands of geese and ducks were dying along the Texas Coast. Rumors had it that the birds were poisoned; that on some bays the dead birds drifted up to form veritable rafts; that it was not safe to eat any goose killed along the coast. Intensive investigations subsequently revealed a loss of possibly three hundred geese. The cause, determined through examination of bird specimens and laboratory cultures, proved to be a fungus infection known as aspergillosis.

The ailment is fairly common among game farm birds. Actually, little if any hazard existed. Badly infected birds were plainly too poor for the table. Those in a healthy condition were perfectly safe.

A few weeks prior, the rumor factory proclaimed that hundreds of East Texas deer were dying of "black tongue." Ever find a dead deer whose tongue was not black? "Black tongue" as a disease is known only among dogs. Also, surveys failed to show a heavy summer loss of East Texas deer from natural causes.

During the early 1940's, Hill Country deer were reportedly dying in great numbers, from attacks of hemorrhagic septicemia. Subsequently diagnosis of specimen after specimen from the region revealed nothing more infectious or contagious than malnutrition. The principal trouble was a deficiency of proper food.

Natural losses of game and fish are disappointing. Unfounded rumors about such developments can lead to hysteria. Instead of spreading rumors, a better course would be to head them off and pass along only authenticated information.

∨ ∨ ∨ W. C. GLAZENER  
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