

# Texas Game and Fish

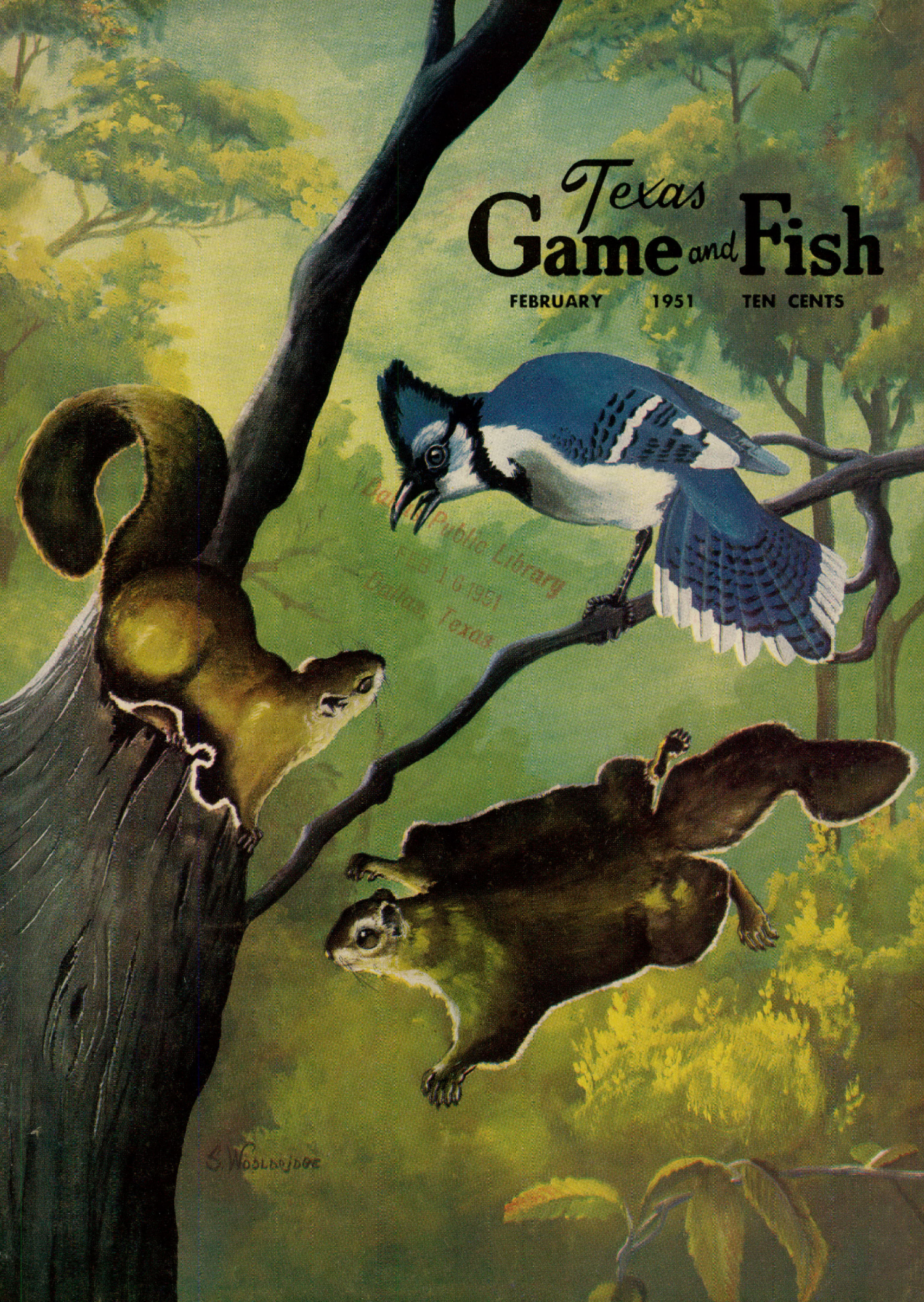
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# Texas Game and Fish

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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COVER—By Sidney A. Wooldridge

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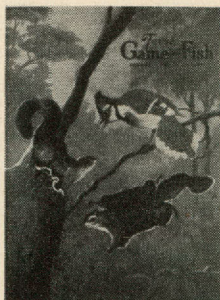
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ROBERT G. MAUERMANN  
Editor

### The Cover



The noisy happy-go-lucky blue jays and the secretive night-dwelling flying squirrels are the subjects of this month's cover by Sidney A. Wooldridge. Although beautifully colored birds, blue jays make a nuisance of themselves with their coarse, unpleasant screams. They add to their unpopularity by destroying fruit, the eggs and young of other birds. The flying squirrel is one of the most beautiful and graceful of our squirrels. Its large round eyes are better adapted to darkness and are very sensitive to light. Although it is known as a flying squirrel it does not actually fly. However, it is equipped with a unique hair-covered membrane on each side of its body that enables it to glide from tree to tree.

# WANTED: NO. MD-16303

By  
ERNEST MARSH\*  
and  
MARTHA W. WEST

"Lost, strayed or stolen from the High Plains of Texas, a young maverick, six months old. Last seen by Shorty Felts in an elm tree 4 miles southwest of Dalhart on June 24. Wears identification bracelet with the number 16303 inscribed on left leg. If found please report to owners, foreman indicated thereon."

And so might go 4,608 news flashes over the press wires covering North and South America. For that many young and adult mourning doves were banded in Texas during the past summer and fall. And we need to hear from them.

Reports on the future whereabouts of these birds and others banded in other states, Canada and Mexico, help the wildlife caretakers solve the many problems affecting the mourning doves abundance.

We kill lots of doves in Texas each year. Where do they come from? If they are raised at home, then we at home can take steps to increase their production. But suppose they are raised in Kansas and must fly through two states of hunters before they reach our guns. What then? Only cooperation, and properly regulated kills will assure any birds getting through to us.

Where do they go from Texas? What problems confront them there to keep them from returning another year? When do they move and why? How long do they live?

A hundred questions can be partially answered with each little note reporting the end, or comings and goings of these marked birds.

During the 1950 summer, several hundred hands were roped into this biggest banding program in Texas. John Hudson was one. He wrote on July 17, "In May, you sent me 50 leg bands to band mourning doves. I have used all of these bands and thought I would write the story to date."

He worked a district in north-eastern Texas and found nesting birds plentiful in good locations.

"On June 2, I banded 7 doves," continued Mr. Hudson.

"This was some 5 miles south of town, and all of the doves were nesting in a cedar hedge. I found 15 more nests with eggs on that date. On the 14th, I went back, and all of the doves were gone except 4, and all of the eggs were hatched. Two young birds that I banded on the 2nd were still on the nest or beside the nest, and two more eggs were in the nest. I find in over 50% of the nests one egg is hatched on one day and the other eggs are hatched the next day. This is because the old dove starts setting on her eggs when she lays her first egg. Sometimes the previous hatch is still in the nest or beside the nest."

"Judging by the first birds which I banded on June 2nd, these doves

were now in their third hatching. I have come to the conclusion that each pair of doves are using the same tree most of the time and also most of the time the same nest."

There is nothing particularly new about banding. King Solomon and some of his predecessors used different sizes and colors of rock beads to mark their domestic stock. Now, we have fancy numbered and addressed aluminum tags or bands to mark our animals. On the other hand, our hospitals still use beads for marking the identity of their infant crop! In all cases, the purpose served is the same. We are trying to keep up with our property.

It is not a very easy job where our wild animals are concerned. But it is just as essential if we are to be held accountable for their welfare. We must learn and appreciate the conditions that affect our wildlife wherever they may be at different times each year. Only then can we have an intelligent management program.

We have learned a lot in the last 100 years. However, conditions are always changing and we must keep up with these changes.

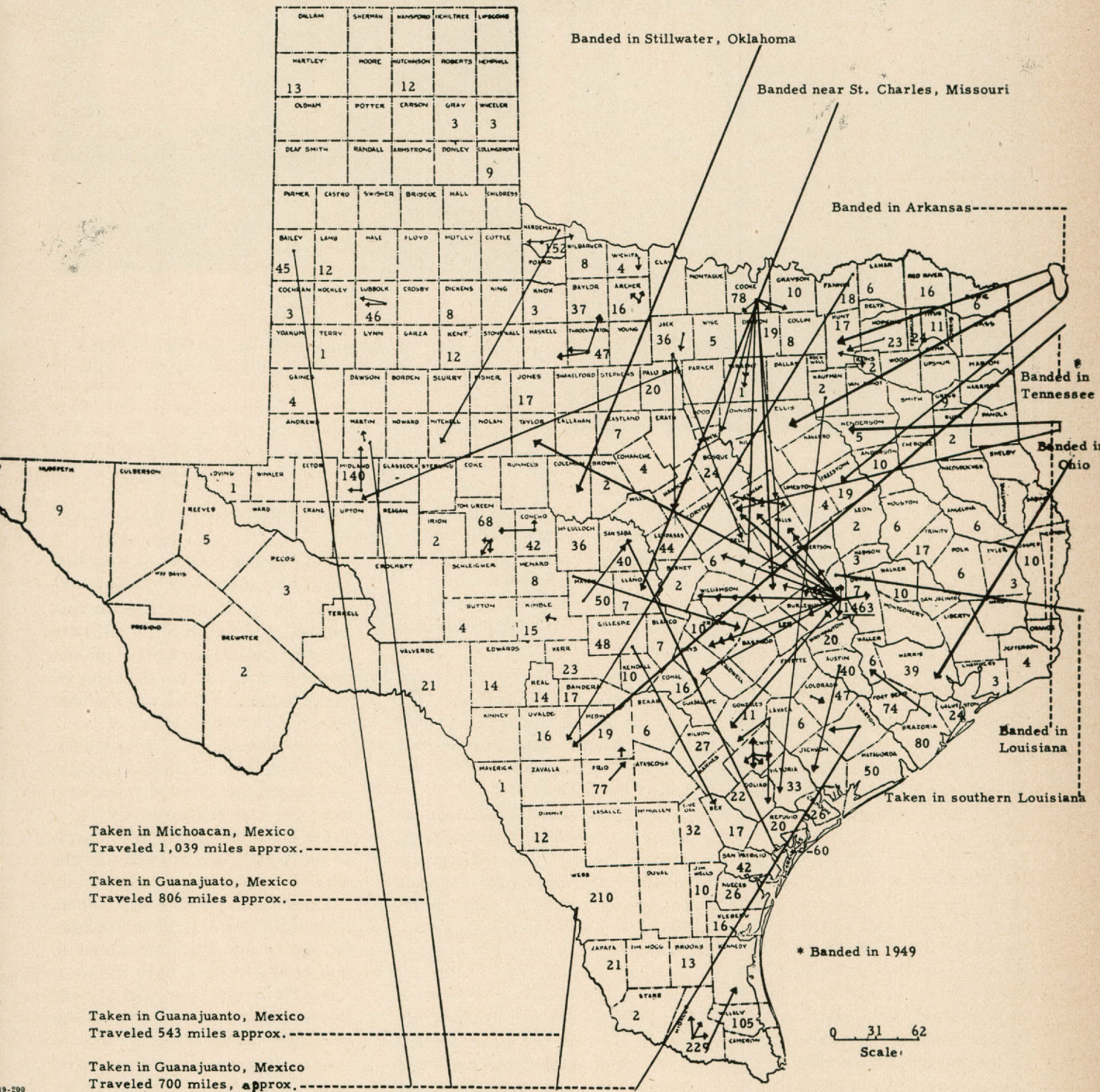
In the face of winter blizzards years ago prairie chickens in the Texas Panhandle drifted far south. As the Plains country was settled, cities grew up, and great expanses of prairie grasses were turned to barren soil by farming or overgrazing. These conditions came to be barriers across the route from north to south. Now when a blizzard comes, the chickens cannot move southward. They have no choice

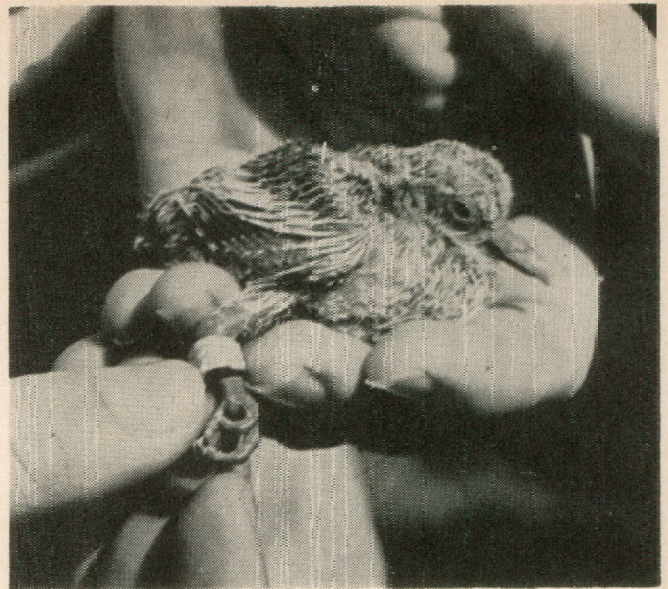
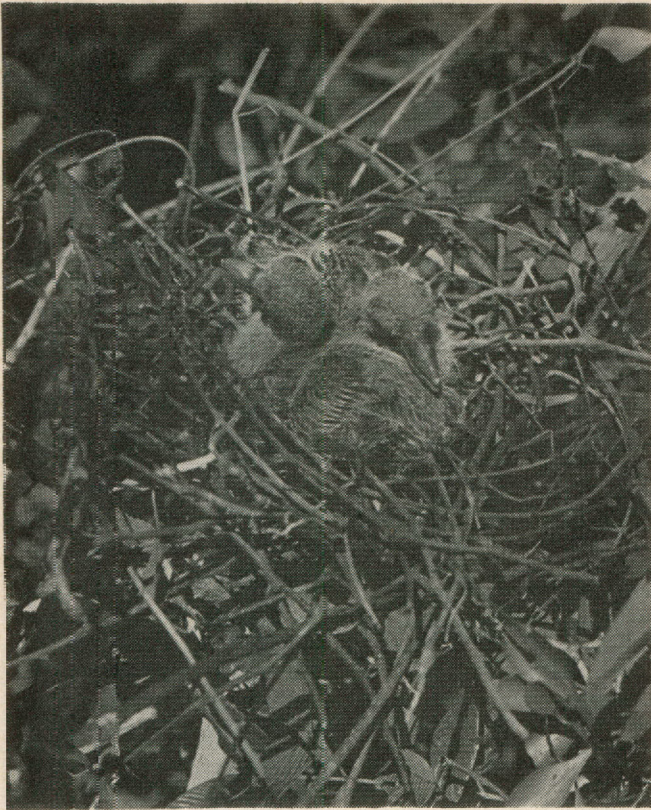
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## BANDING IS AS OLD AS KING SOLOMON

\* Assistant Coordinator and Statistician, Federal Aid Coordination Project.

Travel routes of Texas mourning doves in 1950. Lines connect point of origin of banded bird to point of kill indicated by arrow. Numbers within the counties give the total birds banded in that locality.





No. 16303, on the extreme left, and his sister, as infants three days old. Above the young maverick is banded.

but to fight out their existence as best they can. Many must die for lack of food in deep snow and sub-zero temperatures.

Prairie chickens are not what we term migratory birds. That is, they do not habitually move great distances between definite winter and summer ranges. Still, they do move some and our having eliminated their chance to move just one or two hundred miles is now considered to be a serious factor limiting their numbers on the Panhandle range.

Aristotle wrote some on bird migrations. About all he knew for sure, though, was that seasonally, birds disappeared. He and his friends advanced the theory that they went to the moon and spent the winter! He was firmly convinced that a number of birds found hiding places in dark caverns and went into hibernation for the period of cold weather.

In the late 1800's, the hibernation theory was very prevalent regarding cliff swallows. Many learned papers were published in our country in support of it. These birds supposedly flew into the great swamps around our coast, streams and lakes. They

would work themselves down into the murky water and mud to remain there in a state of stupor until spring. It was even rumored that fishermen, seining for fish, often found their nets containing both fish and swallows!

Some birds flew out over the great oceans. When exhausted they fell into the water and sank to the bottom. Months later, they assumed a new form and returned to our forests and fields!

Columbus was a smart man as history has verified. After traveling westward in the Atlantic for several months, he became despondent over not having arrived on some shore. His crew was threatening mutiny. Undoubtedly, he was on the verge of turning back to Spain.

In his ship's diary on September 17, 1492, he reported seeing birds that he knew did not move far from land. Sandpipers, doves and other birds were seen, some of which alighted on his ship to rest.

New hope was gained. So he said in his diary.

"October 7, 1492, saw many birds flying north to southwest, probably flying from winter. Our course was

then changed from west to southwest."

On October 11, still following the birds, they sighted their first land!

Of the 4,608 mourning doves banded in Texas during 1950, one hundred and one were killed and reported to the State Game Commission and the U. S. Fish and Wildlife Service. These records are summarized on the map, page 3. The lines indicate a point of origin of the bird and its end, usually at the approximate point of the arrow. Numbers in the counties indicate the number of birds that were banded in that area.

On first glance there appears to be little consistency in these records. Realize, though, that these represent only brief periods of time, less than 2 months in some cases, and about 6 in others. Next year's records will be even more interesting.

Conspicuous in the returns to date is the movement of birds from middle eastern Texas to more western parts of the state. This indicates that hunting seasons populations in the Dallas—Waco—San Antonio region are dependent to a large extent upon the successful nesting in the

region of Brazos County. Birds from the north central counties also move into this hunting zone.

There are few returns from the birds banded in extreme eastern Texas. This country suffered a hard drouth during the period when dove food producing weeds would have matured. This failure in food may have caused a before hunting season shift of the population to their winter range somewhere south.

Something similar to this must have happened with birds raised in the more western part of the state. However, the few returns there of the relatively fewer banded doves show a relation of birds killed to those raised locally.

By the first of October reports of the banded birds began arriving from Mexico. Four of these were obtained, all from two states far into central Mexico. This Mexican region is subjected to considerable hunting from a large proportion of townspeople inhabitants. Absence of returns from other sections bears out the contention that our migrating

bird populations are not killed in Mexico.

One lone bird from Brazos County in central Texas wanted to be different. Someone said his mother was crossed with a Cajun redbird! Anyway, he flew east and met his doom in Louisiana. Only one bird, from Aransas County, moved any great distance northward.

Nine birds banded in Ohio, Tennessee, Arkansas, Missouri and Oklahoma started through the state, apparently headed for Mexico. They stopped too long near central Texas hunters.

Two-month old birds were seldom found more than 15-20 miles from their nest. Except one little fellow 2½ months old, that moved some 700 miles from Bailey County to Guanajuato, Mexico, to set something of a record.

There are other things that we can begin to learn from these first records. Perhaps our birds winter in the plateau country of central Mexico. Perhaps our hunting success is mostly dependent on favorable conditions in our own state. More

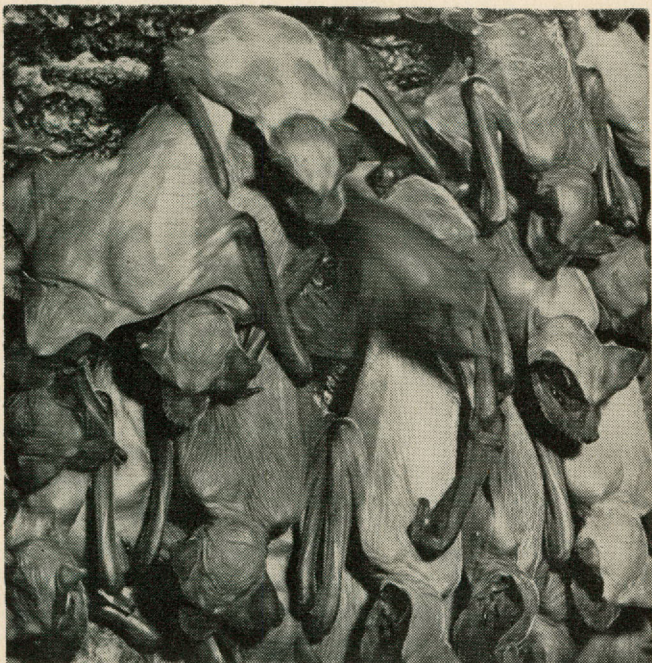
banding and records next year and the next will help us to be more certain of these thoughts.

Grandpa still may not take to these new fangled ideas. His old colored mammy told him that when rats died they went to Heaven and returned as bats. At night then, they flew around over the country and saw all of our evil doings. These facts they passed on to the Spirits. Maybe they do.

But Shorty saw No. 16303 on a scrubby elm on the High Plains of Texas in June. And if Chico finds him eating fruit in his papaya field in Guanajuato, that's a fact, too. Particularly, if Chico will let us know.

It's your property we are working with. You are the owners, Mr. Public. If you run into No. 16303, notify your foreman on this job, the Texas Game, Fish and Oyster Commission in Austin or the U. S. Fish and Wildlife Service in Washington. And we will do our best to get him and the other strays back home to you.

Rats die and go to heaven, later returning to earth as bats (pictured below) to watch over all mortals. Cliff swallows, right, go down in the dark waters of our swamps and stay there until the coming of Spring!



The  
LIFE  
HISTORY  
of  
the  
REDFISH

By  
DEWEY  
W.  
MILES  
Marine Biologist  
for the Copano  
Research Foundation

THIS constitutes the second of two articles dealing with the life histories study of the speckled trout and redfish now being carried out in cooperation with the Marine Laboratory, of the Texas Game, Fish, and Oyster Commission at Rockport, Texas.

It was stated previously in the article on speckled trout (October, 1950), that permanent stations or collecting points were established in an area extending from the Laguna Madre to Matagorda Bay. These were selected after preliminary tests were made to determine their desirability to fish as habitats. While some additions or changes had to be made, the stations which were set up as good collecting points for small trout were also worked for small redfish. This resulted in some lost time or futile checking during certain months of the year, but it served to establish movements of the small redfish as they progressed in size.

September was the best time to begin the investigation of the life history of the redfish. The back bays as well as the Gulf stations were checked for young redfish. This resulted in losing some time in the bay regions where the redfish young were not found until much later. Several large bull redfish were captured around the mouth of Pass Cavallo, but none were in a running condition and no ripe females were found at all. The author talked to many old timers who had fished on this coast all of their lives and only one had ever actually seen a female redfish in full roe.

The first post larval redfish was picked up in a cove inside Pelican Island in October of 1949. Pelican Island is situated just inside the entrance to Pass Cavallo which leads to the Gulf of Mexico. The island itself lies between Matagorda Island and Matagorda Peninsula; the cove lies on the bay side of the island and is protected from the Gulf currents. This small redfish was 10 mm\* standard length and at that age carried many small black chromatophore markings. These markings later disappear until generally only one large black spot is left on the caudal fin. These markings usually consist of 7 to 8 dots along the lateral line extending from the first

spot on the gill covering to the last spot on the caudal fin. The small redfish has the characteristic head and proportions of the larger redfish but is not as readily distinguishable as the post larval trout.

The small redfish up to 20 mm standard length are easily confused with the post larval golden croaker (*Micropogon undulatus*), which begin to come into the passes from the Gulf about the middle of October to the first of November. Intensive searches for small redfish were made in the back bays and lagoons during the months of September, October, November, and December. During the middle of November a large number of small redfish from 16 to 45 mm in length were found in a small bayou in Aransas Bay not far from the channel at Port Aransas. These were evidently carried by the incoming tidal currents into this region where they were protected by the bayou itself. The smallest redfish were always found around or near the passes leading to the Gulf supporting the supposition that the redfish must spawn in the open Gulf or near the passes themselves. Mr. Pearson's latest contention was that the mature redfish spawned on deep sand bars in front of the mouths of the passes but at a distance of 1 to 5 miles from the pass itself. This supposition was partially supported by a test made some years ago when commercial fishermen caught these mature redfish in these locations by using deep nets after observing their activities.

On October 9, of this year, the first post larval redfish were picked up with a small cheesecloth seine in the shallow water of Cummings bayou. This bayou lies off the main Aransas Pass ship channel about one and one-quarter miles from the Gulf pass at Port Aransas. Twenty-one specimens ranging from 3.5 to 8.0 mm in length were dug out of the grassy patches in the small bayou; the tide was coming in approximately four to five miles per hour at this time. Two weeks prior to this time, schools of what appeared to be bull redfish were sighted in the Gulf from an airplane and some of the schools covered as much as an acre in area. All of the schools looked to be from three-quarters to one mile offshore. This activity was

\* 25 mm = 1 inch.

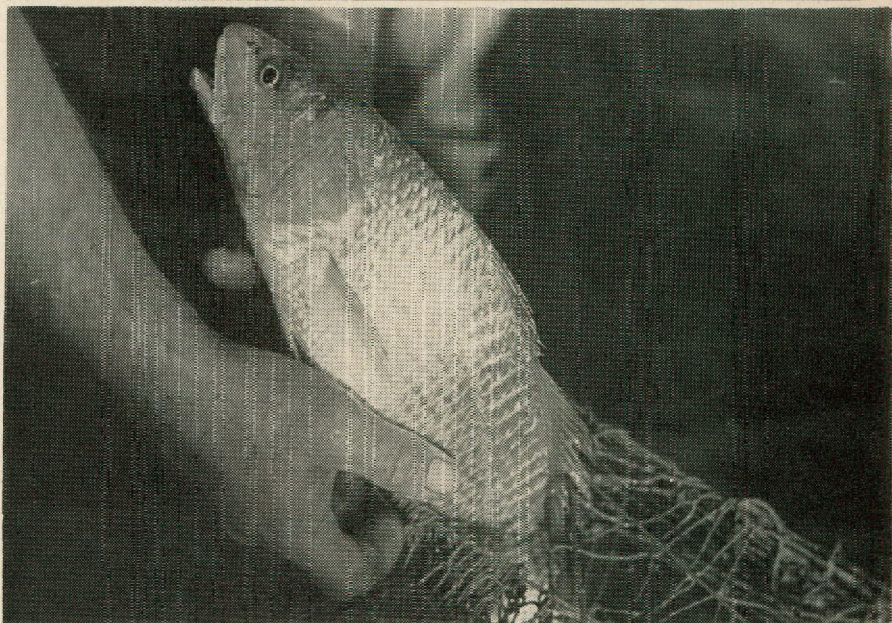
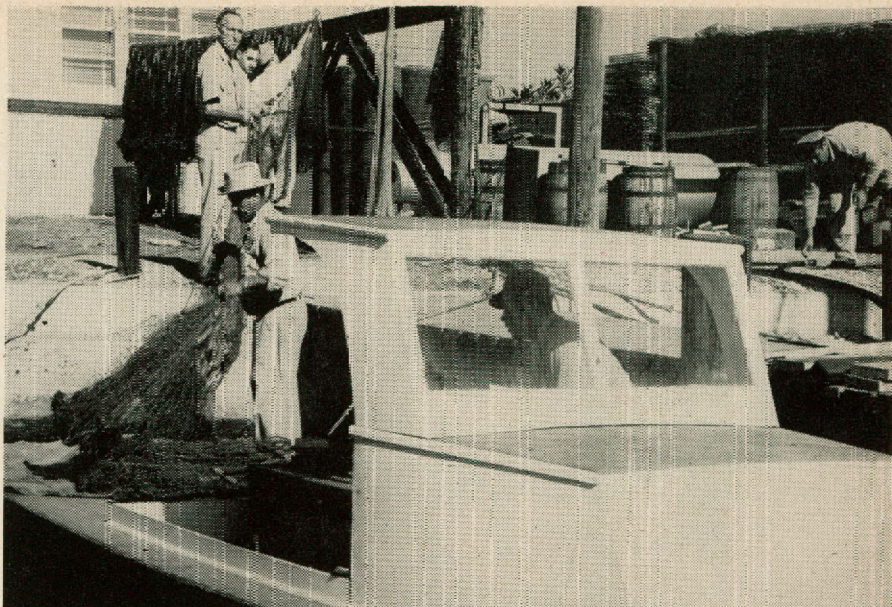


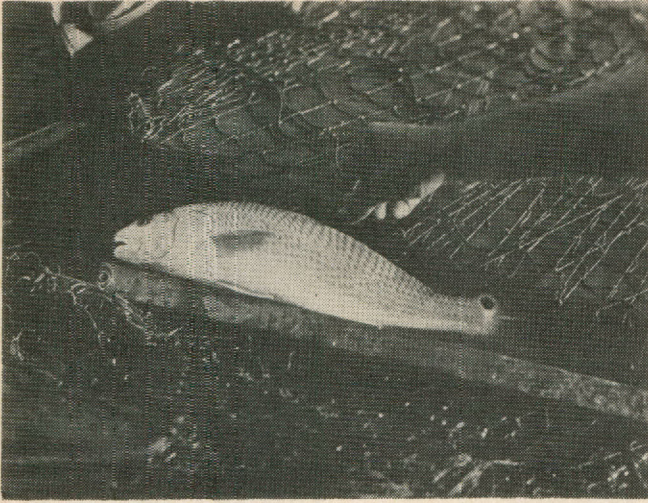
followed from Tampico, on the Mexican Coast, to Brownsville. The observer, J. L. Baughman, Chief Marine Biologist of the Game, Fish and Oyster Commission said the fish were milling around in circles which may precede their spawning activities.

After finding the small reds, spot checks were made in Copano Bay at locations where two and three inch redfish were found the previous winter. No small post larval redfish were to be found at these locations but small trout were still found in limited quantities. The intensive check for small reds in the back bays during the 1949-50 winter and the present winter revealed a complete absence of larval or post larval redfish during the spawning season. This finding established the fact that mature redfish must spawn only in the open Gulf water near the passes and that their larvae come into the bayous and bays on incoming tides.

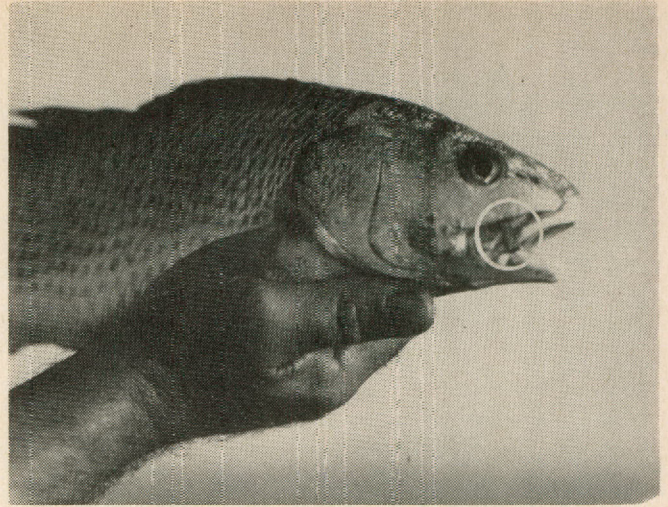
By December, 1949, and January, 1950, the first newly hatched redfish had begun to move back toward the bays and away from the passes, but later crops of post larvae were still collected around the passes. Small redfish sought the same sheltered grassy spots as small trout, and were found mostly in waters with sandy or soft bottoms with patches of vegetation and usually some shell. Modal lengths from October to January ran from 10 to 55 mm and minimum lengths in January continued to be around 20 mm. Maximum lengths of redfish caught in December were as high as 110 mm. The length-frequency method of age determination placed the 7 to 10 mm redfish at about 1 week old. A redfish spawned in October of one year would reach a modal length of 260 to 320 mm by the end of September of the next year. This would put the average redfish between 10.6 and 13 inches in length at the end of the first year. The growth rate does not remain constant for the succeeding years. A portion of the first year redfish attain a length of 14 inches which makes them available for market.

The research crew loads the trammel net preparatory to catching redfish. In the second photo, Dewey Miles, marine biologist for the Copana Research Foundation "plants" the redfish net. A small redfish is inspected as the net is retrieved.





Each specimen is carefully measured.



A detail shot of a tagged redfish. The tag is encircled.

Many scales from redfish of the "rat" size running from 12 to 15 inches standard length were examined microscopically for annular rings which develop during the winter as the growth rate decreases. In all of the scales examined, about 300 to 400 of them, only one annular ring was discernable. Most redfish of this size class are found on shallow grassy flats in secondary and tertiary bays during the early spring months of the year, March, April and May. During this same period, the back bays are nearly devoid of the small reds which have not reached the 10 to 12 inch size or those under one year old. The small redfish of four to six inches move out of the back bays in the spring and congregate around the sloughs and bayous near the open gulf. This condition was especially noticeable around Pass Cavallo and Cedar Bayou. Large redfish of the 24 to 30 inch sizes were frequently seen in the shallow waters of Copano, St. Charles and Espiritu Santos Bays. These large reds feed among the bottom grasses in schools of 5 to 50 or more fish and can be seen often in water depths of 1½ feet. These reds will begin to move through the Gulf passes around the 1st of September and not seek the back bays again until the cessation of spawning. The fish trap in operation at Cedar Bayou should furnish valuable information on sizes of adult ripe redfish early this winter.

The redfish, both large and small, have fairly closely aligned diets. Both

extremes of large and small sizes of redfish eat heavily of commercial and grass shrimp, and in addition the very small redfish eat many species of small larvae shrimp. While the larger redfish eat a large number of blue crabs, the smaller redfish take them only occasionally as food. The small ones do feed heavily on the small nereid worm which is abundant from December to March. As is the case with the large redfish, the small ones eat several items of food at one time as is evidenced by their tightly packed stomachs. In most cases, redfish of all sizes seem to be more voracious feeders than corresponding sizes of speckled sea trout, but when necessary, redfish can sustain life for many weeks without any food at all.

Many sportsmen often raise the question, "why won't those reds bite when we can see them in the water?" After having watched redfish of all sizes feed in an aquarium, perhaps this is one of the answers to the question. Rat reds of the 14 to 18 inch size will feed voraciously on as much as 5 to 30 of the small commercial or grass shrimp. When they stop feeding, they seem to cut it off abruptly, but often changing the diet to a mullet, a small blue crab, or a flatfish will induce them to begin feeding again on the new food.

Redfish of the four and five year class are well scattered over the bays and estuaries until spawning time approaches in early September and October. At this time, the big bulls move

toward the Gulf passes in large schools. Some schools with as many as 50 to 80 adult redfish have been seen migrating along the Gulf beaches from September to November. Several large bulls from 20 to 27 inches standard length were opened last fall in order to examine their reproductive systems. None of these were ripe or in a spent condition but one 25.6 inch male redfish examined in November of this year had spawned and weighed 5.2 pounds in his emaciated condition. This finding is something new and has led us to search for more redfish under 28 to 29 inches in length which have attained full maturity. Only large numbers of fish examined can reveal whether this is an irregularity or does occur among many redfish under 29 inches in length. Large catches of reds and trout are examined daily by the Marine Laboratory staff. This is accomplished by cleaning free of charge catches made by sportsmen fishing in the Rockport area. During the cleaning process the required data is taken from the fish and recorded for future analysis. We invite all sportsmen to take advantage of this free service and at the same time make available to us much valuable information which is needed to complete the life history of these fish.

Many redfish of all sizes have been tagged in the Rockport area and the fish trap at Cedar Bayou where a permanent station is maintained. These tags, which bear a number, are

made of bright metal and clipped onto the upper jaw of the redfish and trout. We have had many sportsmen ask where they should look for the tag on their fish so we are in hopes that this information may clear up some doubts. The tags should be seen easily by anyone removing a hook from the mouth of the fish or when stringing the fish. When found on the fish, these tags should be brought to the Marine Laboratory at Rockport or given to any game warden or biologist or merely mailed to the Marine Laboratory with a note as to where the fish was caught, the date caught, the length if some measuring device is at hand, and the weight which of course we know is not probably to be taken while fishing. Recovery of these tags is very important to this investigation and cooperation from commercial and sportsfishermen is greatly appreciated. Every note and tag received by mail is answered and all information resulting from recovery of the tag is forwarded to the person who surrendered the tag.

For the most part, returns on tagged redfish show that the reds were caught very close to the location at which they were tagged and released. This is true even for intervals of three to five months from the date of release to the date of recapture. Since most of these recaptured redfish have been under twenty inches, it is hoped that returns from the larger ones will show more movement.

One 19.2 inch redfish tagged on August 25, 1950, at Turtle Pen Flats in Copano Bay was recovered by hook and line on November 18, 1950, about two miles from the original release location. At this date the red measured 22.4 inches or had grown 3.2 inches in 85 days. This finding agrees with a similar record of a rat redfish growing 1 inch in 30 days during this time of year. This growth acceleration also holds true for the redfish under one year old which grow rapidly from July to October. The greatest distance traveled by a tagged redfish to date has been twenty miles.

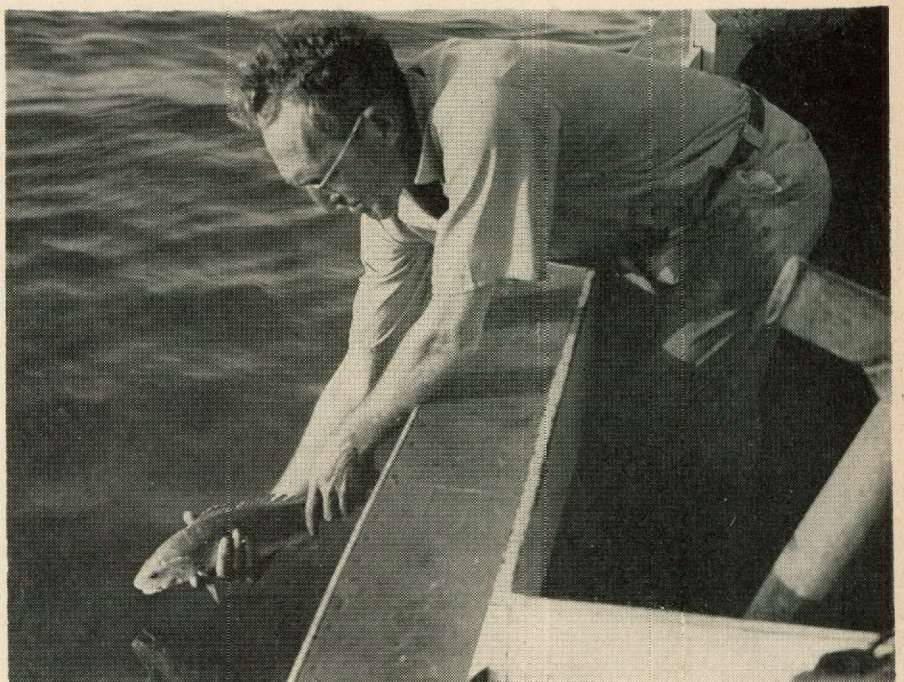
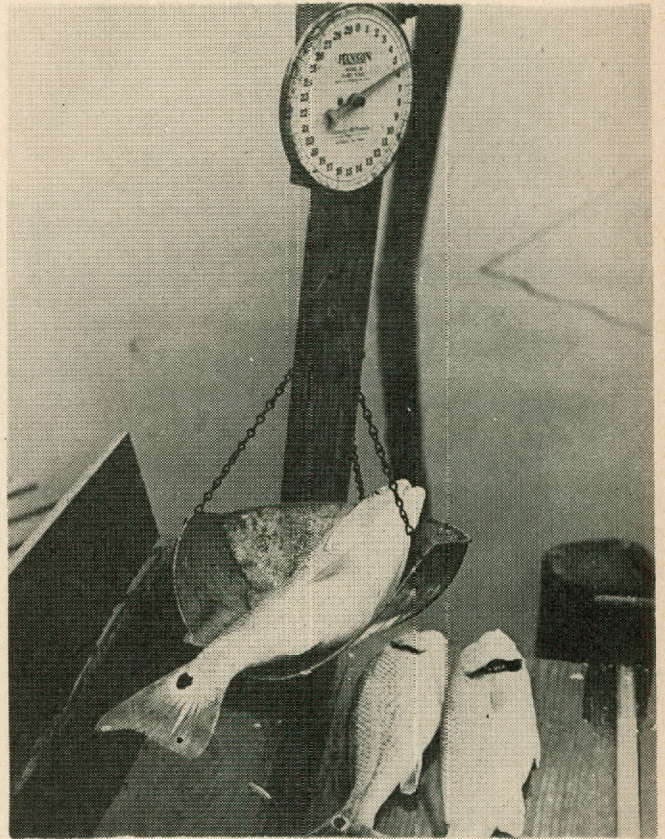
The intensity of the present trout and redfish investigation should give

us enough valid data by October, 1951, to determine our population densities, ratio of males to females, the complete sexual development of both fish throughout the year, their feeding habits and ecological requirements, their growth rates, ages, and weights as they mature, and last but not least

their migration routes throughout the entire year.

These data correlated with present habitat conditions and depletion by other forms of fisheries should be enough evidence for any conservation measures which need to be added or revised.

After weighing the redfish, Sam Nichols, marine biologist for the Game, Fish and Oyster Commission, returns the redfish to its watery home.





## The Brown Ghost

**T**HE little Brown Ghost is an affectionate nickname hunters have tagged on one of our most mysterious game birds, the little brown woodcock. The name fits him well, for he is a very shy, elusive and secretive little fellow. He sits quietly in his retreat all day and forages for his food during twilight hours. Because of the very nature of his nocturnal habits he is difficult to study and understand.

Phantoms are always mysterious and interesting and the little "Timberdoodle" is no exception. Experts spend many endless hours in trying to uncover its secrets, but the little brown ghost continues to defy this

By **GRACE O. BEACH**

spying and prying into its private affairs. In general though, these same habits serve to provide the woodcock with better protection than other game birds.

Woodcocks have a ravenous appetite, as the average bird will eat nearly twice its weight in food nightly. They have a great fondness for earthworms which comprise the greater part of their diet. When they are unable to obtain their regular supply of worms, they soon die.

While the woodcock are rather hardy birds and can stand a great

deal of cold, they are not constituted to subsist on short rations, as so many other wildlife creatures. Therefore, the weather is one of their worst enemies. Early freezes or protracted droughts make it impossible to obtain the favorite supply of food necessary to their existence and this plays a very important part in the rise and fall of the population.

If you've ever been fortunate enough to get a good look at our elusive little friend, you can't help wondering how in the world they ever get enough to eat with that long slender bill, but don't let that fool you. That bill is unique and does the job in excellent fashion.

The lower end of the bill is so sensitive, they can distinguish food well below the surface of the ground and it acts as both a probe and a pair of forceps. The upper mandible of the bill can be moved independently of the lower part, much like a finger. This feature is extremely advantageous and helpful in boring under the surface for food.

Our little ghost has a remarkable sense of hearing. The ears are located directly beneath the eyes, rather than behind them as is common in the bird family. They walk along with their heads cocked on one side, robin fashion, until they hear a stir in the earth beneath them; then down goes that bill deep into the earth in search of their favorite tidbit. At other times, the bird will stand motionless with his bill thrust deep in the earth as though listening.

While there is some question as to whether the woodcock relies upon its sense of touch or hearing in the location of food, it is pretty well conceded by those who study its habits that it uses a little of both with the bill acting as an antenna to register the vibrations of the worm in motion. Anyway, that bill is the little fellow's most valuable possession and he is fully aware of that fact by keeping it immaculately clean and in good receiving condition.

During migration, the woodcock flies low, in single file and at night. This habit is a hazardous one and takes its toll of their number, for many of these birds are killed by hitting against wires, cables, buildings and other obstructions erected by advancing civilization.

The hens are heavier than the males and are slower rising and more deliberate in flight. However, the male has earned the name "Labrador Twister" because of his rapid dodging flight during migration.

They put on a most amazing demonstration of their flying power during the mating season, at which time the male does one of the most dazzling aerial stunts ever seen. He struts about singing in a subdued, whimpering tone, broken at regular intervals with a sort of short nasal call. All of a sudden he takes off on a spiral

ascent with the same twittering sound he makes when flushed. As he soars in a widening spiral, the singing changes to a clear tremulous call until he has reached a height of from 100 to 300 feet directly above his point of take-off.

Once he has reached the pinnacle, the little fellow startles you with another quick change of tactics, for he pitches headlong toward the ground. Just when you suspect he is about to end it all, he suddenly levels off and flutters to a gentle, graceful stop leaving the observer breathless and awe-struck.

Immediately upon landing, the little show-off goes into his act again. These aerial exhibitions last about one minute and are repeated every four to five minutes, always just before dusk and again after dawn.

The male also selects the breeding and nesting place, choosing a site which provides a feeding area, cover for protection and at least one or two

(Editor's note: The 1950-'51 open season on woodcock in Texas was held in the following counties: Shelby, Nacogdoches, Angelina, Trinity, San Jacinto, Liberty, Chambers, and all counties south and east thereof. The dates were December 23 to January 21, and the limit was four per day, with eight in possession.)

cleared areas for singing and courting grounds. His domicile is respected by every other male within the area, and it is a rare occasion when another's chosen area is invaded.

During the period of mating, the male becomes so engrossed in courting and his aerial gymnastics that he loses most of his caution and can be approached at close range. This is one of the most favorable of his habits, so far as the observer is concerned in studying this unusual bird.

The woodcocks build their nests on the ground preferably along the edges of wooded tracts, in swamp thickets or dry ground near the stream. The nests are put together in a haphazard fashion, with dry grass, dead leaves and small twigs, and they are always well hidden from prying eyes.

The birds usually arrive in the north early in April, and the hen is nesting in May. There are usually four eggs, light pinkish brown in

color, sprinkled with deep brown and pale gray. The period of incubation is 20 to 21 days, and during that time the hen rarely leaves the nest, except for brief feeding periods.

A hen will seldom desert the nest, unless she is annoyed too often; then she may abandon the nest and start a new one. This is the exception rather than the rule, however. Usually they don't go far when alarmed and will return as soon as possible. They will often flutter from the nest using the broken wing tactics to lure you from the nesting area.

The young mature very rapidly and are capable of making short flights in two weeks' time. They become very self-reliant in about four weeks and by the time they are six months old, they are the exact duplicates of the parents.

The mortality rate among the young is very low, so that each pair of woodcock will usually contribute two or three birds annually. This is indeed fortunate since these birds will not breed in captivity.

Woodcock do not seem to have an established flyway such as ducks, geese and other migratory birds. Neither do they like to fly across large bodies of water, preferring to stick pretty close to land.

Data collected so far seem to point to the fact that the birds return to their place of birth. Their largest concentration point is at Cape May, New Jersey. There they seem to congregate during migration, to rest until colder weather drives them farther south. They are present in Texas during the winter as far west as Karnes County; however, they occur in greatest numbers in the southeastern counties where they are found in low moist thickets.

When hunting these birds, pay particular attention to the ground cover. The woodcock likes crab grass, Canada blue grass and poverty grass. Also, the hunter must cast an eye to weather conditions. When it is dry, hunt the lowlands and along the streams and swamps. As the higher grounds dry, and the birds are unable to obtain sufficient food, they will move to the moist ground of the lowlands for greater ease in obtaining their favorite food.—Pennsylvania Game News.

# THE BENEFITS

**I**N THAT mazy and interminable work of Oriental piety, the Mahabharata, it is set down that serpents produce out of their mouths the fleecy clouds which supply water for the refreshment of the creator gods. Saint Augustine believed that snakes were embodied devils, sent by Satan for purposes of temptation and other wily maleficence. In primitive Hungary, says Count Gega Kunn, it was the general belief that all snakes concealed, under their forked, flickering tongues, precious stones of fabulous value; and in early Scandinavia it was the theory that the serpents were nothing less than incarnations of the awesome Odin himself.

These myths have been superseded by other serpent myths, scarcely less fantastic, and people throughout the world ardently believe in such well known falacies as those concerning the hoop snake, the whip snake, and the milk snake. However, few people are aware of the snake as a beneficial serpent and fewer still realize how far these benefits extend.

The commonly known way in which snakes aid man is in their consumption of rodents which destroy thousands of dollars worth of farm crops each year. With this brief statement we will leave this phase of the snake's helpfulness, important though it may be, and move on to a more dramatic one, that of its contribution to medicinal science.

Secretions of poisonous snakes have been known to physicians since the days of Greece and Rome. A Hebrew physician, Maimonides, described their use eight hundred years ago in the treatment of cancer and leprosy. Centuries ago South African medicine men rubbed venom into the wounds of injured tribesmen—perhaps guessing at its blood-clotting value. When the white man first crossed the plains of the Middle West he found the Indians using snake venom to cure what they called "fits."

When Doctor Adolph Monaelesser, of New York, was in Cuba during the

Spanish-American war, he saw a leper who had been bitten by a tarantula. Surprisingly enough, as the patient started recovering, he reported that the pain of his disease seemed considerably lessened, and Doctor Monaelesser wondered whether the spider's venom had helped produce this beneficial effect. The thought led to experiments, but it wasn't until 1930 that the physician was ready for a trial on a human being.

By that time he was working at the Pasteur Institute in Paris, and had decided to use cobra venom instead of the tarantula extract, as it was easier to extract, measure, and inject. He injected a highly diluted solution of the venom into the blood of a man suffering from the stabbing pains of facial neuralgia and found that the poison relieved the agony.

Doctor Robert Northwall Rutherford, of Brookshire, Massachusetts, reported in the New England Journal of Medicine in September, 1939, that he had tried cobra venom injections on 17 women, most of them victims of incurable cancer. Of the 17, eight felt completely relieved (several even gained weight, went back to work), seven told him their pain was greatly diminished. Only two had poor results.

The venom is not a local anesthetic, but rather affects the main portion of the brain and its higher nerve centers in about the same way that morphine does. However, cobra venom can be used with a greater margin of safety than the morphine drugs because it is not habit forming and the patient does not develop a tolerance; that is, the dosage does not have to be increased gradually as with morphine. "Side effects," produced when morphine is given, are absent; there is no eye change—the pupils remain constant, and the mental hallucinations are not present. It

may be used alone or with smaller doses of narcotics. The effect is slower than morphine but usually last longer. This means doses can be given further apart.

Doctor David I. Macht, a physi-

By **EDWARD C. HUMPHREYS**

cian, gives interesting findings from the results of his experiments with a group of twenty college students. These students were given mental mathematics problems to solve under normal conditions. Then he gave them problems under morphine and then again under cobra venom. The results showed that cobra venom quickened the mental responses with fewer errors while morphine, codeine, and other drugs lessened their mental efficiency.

Cobra venom also increases the acuteness of vision and hearing as well as muscular performance, while the opiates on the other hand retard them.

In 1935 Doctor Macht, in collaboration with several distinguished surgeons, studied a series of one hundred clinical cases affected with advanced and inoperable cancer and other malignant tumors, and suffering from such intense pain as to require the use of the most powerful narcotics and analgesics. In this series of cases, the effect of intramuscular injections of the specially prepared cobra venom was compared with that of other pain relieving drugs. Favorable results in

# OF Snake Venom

relieving the symptoms were obtained in seventy-five of these cases. The control of pain and improvement in general condition of some of the patients were very striking; and the cobra venom was found to be thera-

## *Wildlife Biologist*

apeutically more effective and satisfactory than morphine or other opiates, or any other drug.

Snake venoms are protein animal poisons, highly complex. They are generally colorless or slightly yellowish. With suitable precautions they may be preserved for years and still retain their original strength. This dried venom is readily dissolved in water, alcohol, or glycerine.

Basically there are two kinds of poison which can kill or cure in snake venom. These are neurotoxin (in cobra venom), which works on the nervous system, and hemolysin (in viper venom), which works on the blood cells.

Cobra venom is the most important because of its greater usefulness, but tests with the reptilian poisons have revealed that the venoms of certain adders and other snakes as well as cobras also contain pain relieving substances. Copperhead venom has been used to relieve patients suffering from a host of ailments, including forms of neuritis, arthritis, and neuralgia. Poisons from such reptiles as water moccasins and rattlesnakes contain substances which when

injected into the body, make the blood clot faster and have been used to heal surgical wounds and curb the bleeding disease hemophilia.

In a case of hemophilia, for example, in which it normally required 20-45 minutes to get sufficient coagulation to stop bleeding, a dilute solution of viper venom caused the blood to clot in 17 seconds. Also, injections of water moccasin venom in expectant mothers materially reduced the amount of blood lost during delivery.

Another example of the usefulness of moccasin venom may be found in the treatment of Kaposi's varicelliform eruption. This rare and dangerous skin infection which produces high fever and painful, serum-filled blisters was first described by Doctor M. Kaposi of Vienna. The disease resembles chickenpox and is caused by the virus that is responsible for such common infections as fever sores and mouth cankers. As is usual with diseases of this kind, sulfa drugs and penicillin have little effect. Two cases of treatment with moccasin venom were reported by Doctors Leslie P. Barker and Earl S. Hallinger, Jr., in the *Journal of the American Medical Association* in September, 1947. In the two cases presented by the doctors, results were prompt and satisfactory. In the first, penicillin was used along with the snake venom to control secondary infection. After each injection of snake venom, there was a drop in temperature with no further rise after the third treatment.

In the second case, diphenhydramine hydrochloride was used along with the snake venom to take care of any possible allergy. Twelve hours after the treatment was begun, symptoms disappeared and the patient's

temperature went down to normal.

Snake venom also takes its place in combating the bite of the snake itself, in the form of snake bite serums which are prepared by injecting venom into horses until they become immune to the poison, then separating the blood.

The first antivenom was made by Doctor Albert Calmette, at the Pasteur Institute, in Lille, France. He was also associated with some of the early work of Doctor Monaelesser. Today, there are well-established snake farms and antivenom laboratories in various parts of the world. The first of these was established near San Paulo, in Brazil. The work was begun as a hobby by Doctor Vitalo Brazil and was later taken over by the government. At Tela, Honduras, another snake farm provides serum against the poison of Central American snakes and at Bangkok, Siam, a laboratory turns out antivenom against serpent bites in the old world. A snake farm at Glenolden, near Philadelphia, Pennsylvania, supplies the antivenom for North America. The laboratory at Port Elizabeth, where work in venom and its use in epilepsy has been carried on, is responsible for combating venomous snakes in Africa.

Venomous snakes are found on every continent, on many islands, in valleys, and in mountains, in the tropics and in the temperate zones, even inside the Arctic Circle in northwestern Europe where the subsoil is not permanently frozen. There are venomous snakes in the sea, along the shores of the Pacific and Indian Oceans. But your chances of encountering a venomous snake are not actually great, even under favorable circumstances.

Taking all into consideration, the benefits and services derived from snakes, both poisonous and non-poisonous, greatly outweigh their harmfulness.

# HOW DO YOU

**I** FISHED for many years with a fellow Texan who was a genius at evolving theories that added to his ease and comfort in life, and one of those theories came to be known as the Fanning Smell Theory—in his honor.

John Fanning, a well-known Texas theatre man who lived at Brownsville, fishes no more. The easy chair into which he wedged his bulk and dozed off with one rod clamped to the armchair and one in his lap has long been empty.

But, as in the case of most original thinking, some of his ideas live on—in particular, his smell theory.

“John,” I used to say to him, “you cooked up that theory for the sole purpose of avoiding work. You sit there in that easy chair and let Pablo catch the mullet, cut the mullet, bait your hook, then wade out and cast onto the bar and bring the rod back to you. Would it scare the fish any more if you waded out and did the casting?”

“Aha, my friend, you don’t have a

scientific turn of mind,” he would reply. “That’s the trouble—you reject the new on the basis of prejudice, not analytical thinking.” Then he would wade into the middle of a vast sea of intricacies that went to make up the Fanning Smell Theory. And it was a doggone good theory—a honey of a theory. It’s still all right.

John would explain that all people have smells—some of one kind, some of another; some big ones, some little ones. Evidently he thought he had a whopper of a smell insofar as fish were concerned.

“I am definitely anti-fish,” he would say to me. “Fish are allergic to me. If I so much as touch a mullet, no fish will take it.”

“I don’t like to touch the stinking things, either,” I would tell him. “But I admit it. That’s why I use a spoon or a plug. And how about a plug? How about its smell? A plug smells like a mixture of varnish and cedar and steel and maybe a little grease, with some stink off my hands thrown in. I catch fish . . .”

“Ah, but you probably have a smell that fish love,” he would say, with a twinkle in his eye, “probably just like mullet.”

Me smell like a mullet?—Fiddlesticks! Even when a mullet is brand

By HAR

new, cut into chunks while he’s wiggling, he has a stink that makes me shiver like a cat smelling an old pipe. Whereas I smell . . . well, I guess I’m not sure. You get used to your own smell and don’t notice it.

I would argue with John. But I couldn’t argue him down. He said he had watched it for years, and that he was positive some people had a pro-fish smell and some an anti-fish smell. Now Pablo, that was his helper, his Man Friday, had what John said was a beautiful pro-fish odor. I got up close and smelled Pablo. Maybe so . . . you never can tell about fish. Peculiar customers.



John getting ready for action—he was definitely a two-rod man.



# SMELL TO A FISH?

Everything Pablo touched would attract fish, John said. And it was a fact that John caught a powerful lot of fish in his day. I went with him on trips all the way up the coast to the Galveston area, and all the way down

ILWELL

to the Eighth Pass in Mexico, and he almost always caught fish—big bull reds. He always took Pablo and his chair along. Fishing to John without Pablo or the chair was unthinkable.

He would ask me to explain why it is that sometimes one fisherman continues hauling out fish after fish while a man right beside him, using the same kind of bait, may not catch any fish.

I've seen that. In fact, it's happened to me—I've been the man who wasn't catching fish, even when I was using exactly the same lure, or live bait, that somebody next to me was using. In such cases when the man

catching fish hauls one out, I hog his spot—I put my bait right where he was. Sometimes he keeps right on catching the fish.

Well, the explanation of that is simple, according to the theories worked out by John Fanning. It's the smell. The man hauling in the fish has that rare and precious asset, a stink that fish like—maybe a smell like an earthworm, who knows? I heard so much of that theory that one day I decided to pull a gag on John, so I carried along some eau de cologne and rubbed it on my hands and on my lure. I caught a ladyfish right off the bat. John swore that really proved his theory, right up to the hilt.

Sometimes I would fish with cut mullet, and sit alongside John, and we would work around to the fish smell argument, and I would figure I just about had him beat down, when all of a sudden he would hang a bull red.

John would get up and do battle, standing solidly, neither advancing

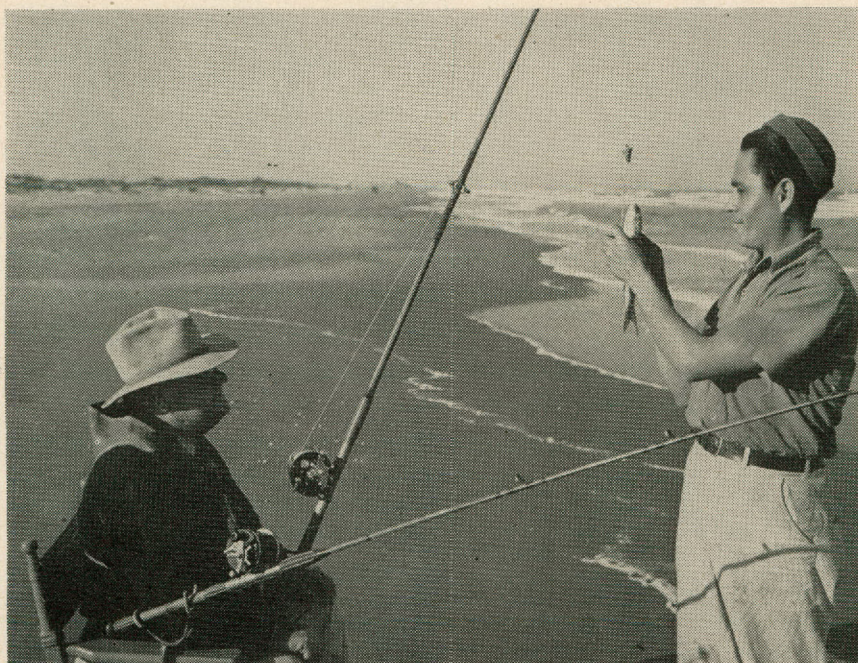
nor retreating. He would whip down his fish and work it in. Pablo would take the fish off, rebait the hook, walk out and cast onto the bar again, then bring the rod back to John.

John would be laughing. Again he had proved his theory.

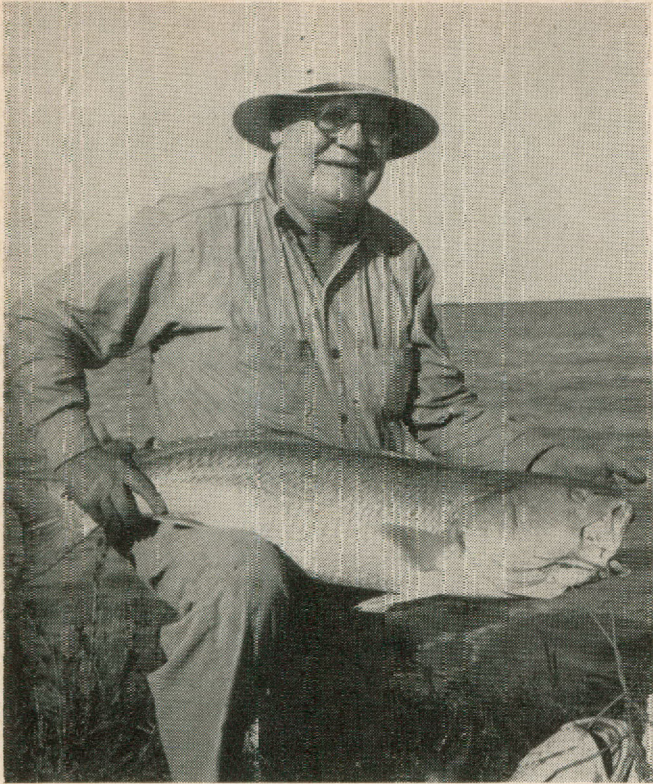
If he caught another fish before I did, I would reel in, get my casting tackle, and walk on up the beach, trying my luck in the surf with a plug or a spoon. Let John have his stinking smell theory, and catch his bull reds.

And John, with nobody to keep the argument alive, would yield to the soothing murmur of the sea and the caressing warmth of the sunshine and drop off to sleep, dreaming perhaps about a fisherman's heaven in which all the huge fish would come rushing at his cut mullet because of that beautiful smell of Pablo's.

As I said, John is gone now. He's been gone for quite a few years. But I never go back to the surf and toss a lure into the rollers without thinking of him. I always see him in that



Pablo baits the hook. John watches.



John with a bull red. He caught plenty of them in his day.

easy chair, with one rod clamped onto the arm of it and the other rod in his lap, his head bowed slightly forward as he dozed peacefully and serenely.

My own life has been a bit fuller for having known him.

And to this day I speculate on that Fanning Smell Theory. I wonder that the brotherhood of anglers hasn't done a little more poking into it. Do fish detect the human odor on a cut mullet? And if so, do they object to the odor of some people? It seems fantastic to me, considering that foul mullet smell. In fact, I still feel offended at the thought that a fish might find my odor repulsive and that of a mullet delightful.

But stranger things than that do happen in the world.

The creatures that survive through the maximum use of the senses and a rather limited use of the brain do strange things with those senses. I know that a dog cannot only smell me at quite a distance, but can pick up my "stink" on the ground hours after it was left there. And that isn't all—he can tell whether I'm angry or

happy, whether I'm afraid of him or not, just by the smell I give off. No wonder some people look at me with curiosity!

Fish are pretty doggone good smellers. It is generally agreed that many

fish rely on their sense of smell even more than their sense of sight in finding food. There are instances on record where blind fish have got along pretty well. Why wouldn't fish notice the human odor on a chunk of mullet, or on a lure?

It's a juicy subject for investigation, or for "fish talk" around the campfire late at night. And I've talked to lots of fishermen about it. Even though I still believe John cooked up that theory just so he wouldn't have to put his hands on mullet or get up and walk into shallow water to cast to the bar, nobody has come along and proved that he was entirely wrong.

I hope nobody does. It's nice to have a few theories around that you can just keep playing with—that nobody can prove or disprove. In fact, so far as I am concerned, nobody ever will disprove the Fanning Smell Theory completely. I'd feel like a traitor to the memory of an old friendship if I let myself be persuaded that John was talking through his hat.



Waiting for action, and enjoying the murmur of the sea.



## LESSER SNOW GEESE

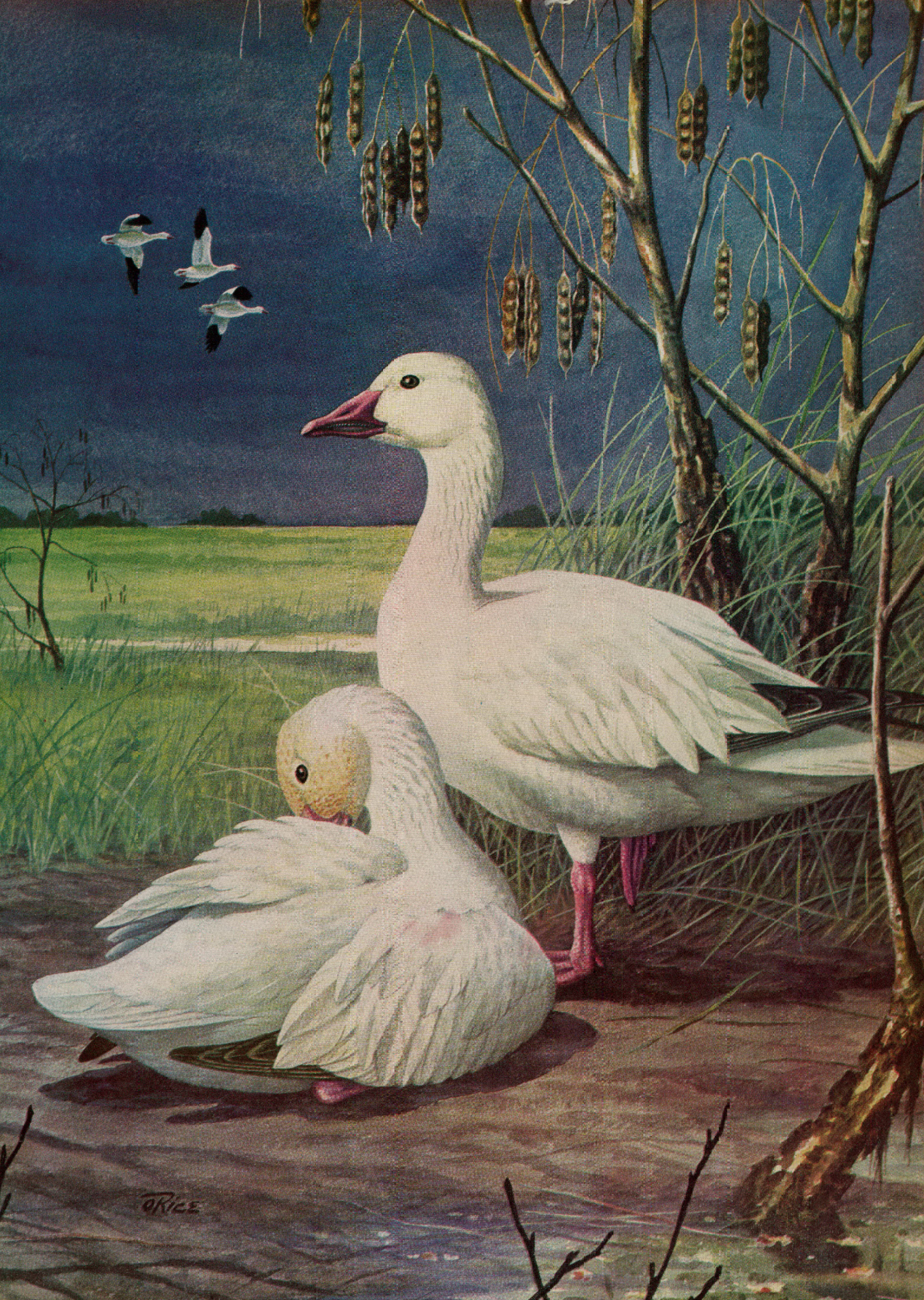
The Lesser Snow Goose, *Chen hyperborea hyperborea*, in all probability, is the most abundant of all the geese on this continent. As implied by its name, *hyperborea*, beyond the north wind, the Lesser Snow Goose is a northerly breeder, nesting on the islands of North America and on the Arctic coasts.

These geese are easily identified in flight because of their snow-white plumage with the black wing-tips. Flying high and fast, and in long diagonal lines or in V-shaped flocks, Snow Geese chatter shrilly as they go along.

They take advantage of the first north or northwest wind to start their migration southward, and in 24 hours, they have deserted their summer homes. Then early spring finds them winging their way back to their nesting grounds. They sometimes return from the south long before the ice and snow have completely melted from their favorite feeding grounds. Lesser Snow Geese do not dive; therefore, they live upon bits of seaweed that are attached to the ice, or upon crustaceans that swim near the top of the water.

Many of the geese are mated by the time they reach the nesting grounds; others mate afterwards. The nests of the Lesser Snow Geese are usually found on dry ground near the edge of a lake, or often inland three or four miles from salt water. The clutch may contain from four to eight eggs, but the usual number is six. The male stands guard while the hen incubates the eggs. The period of incubation is about 22 days, during which time the birds are very devoted to one another. It is thought that these geese mate for life.

While the Lesser Snow Geese are not as plentiful as they once were, they still provide plenty of sport for nimrods. However, the flesh of the Lesser Snow Goose is not regarded as highly as that of some of the other species.



ORICE



# 'POSSUMS: *Dumb But Numerous*

By FRANK SAMPSON

“AN OPOSSUM hath an head like a Swine, a taile like a Rat, and is of the bigness of a Cat. Under the belly she hath a bagge, wherein she lodgeth, carrieth, and sucketh her young.”

Thus Captain John Smith records the opossum as native in America in his 1612 description of Virginia.

The editor of this magazine says that the opossum is so well-known to the public that the public knows nothing about it. If this be true, it is about time that we take a closer look at this plodding little fellow who in some states produces a big share of the fur harvest.

In the harvest of 'possum pelts, as reported by the U. S. Fish and Wildlife Service, Missouri ranked at the top of all other states in the 1948-49 season, with 172,789 pelts sold. Arkansas ranked second with 115,920 pelts, Texas third with 91,461 pelts, and Illinois fourth with 79,505. So, for all his reputed laziness, the opossum deserves a lot of credit even if he neither toils nor spins.

Although his hide isn't worth very much—about 30 cents last year—he provides fur hunters and trappers with considerable fur income. With rising pelt prices, it is quite possible that his hide will be worth more this year. Besides his use for fur, his edible meat and sporting qualities make him a fairly popular little beast.

Probably opossums are best known for their so-called trick of pretending to be dead, or “playing possum,” when cornered. Yet their well-advertised aversion to fast movement in escaping danger has also given them a reputation for being somewhat less than bright. However this may be, the opossum may not be such a slow-poke all the time.

When it comes to multiplying, the opossum gives the celebrated cottontail rabbit a run for her money. A mature female cottontail produces a yearly average of about 17 young in four litters. The labor-saving opossum may produce just as many or more young and does it with only two litters a year. Recent studies by biologists indicate that opossum litter sizes run from 5 to 14, with an average of about 9 young per litter.

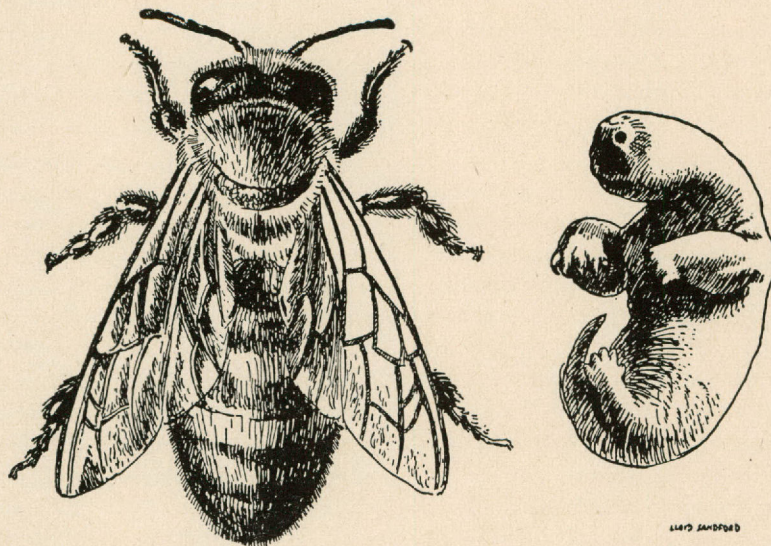
It is generally evident that the breeding season begins with

mating about the first of February and ends with the weaning of the last litter the early part of September. Although opossums are rarely given to rushing anything, they do have the shortest gestation period of any North American mammal—only 12½ days. However, this time is made up by the young suckling six to eight weeks in the mother's pouch. And, speaking of pouches, the opossum is the only mammal in this country that raises its young in a pouch, similar to the kangaroo of Australia, which is related to the opossum. Both belong to the order of marsupials.

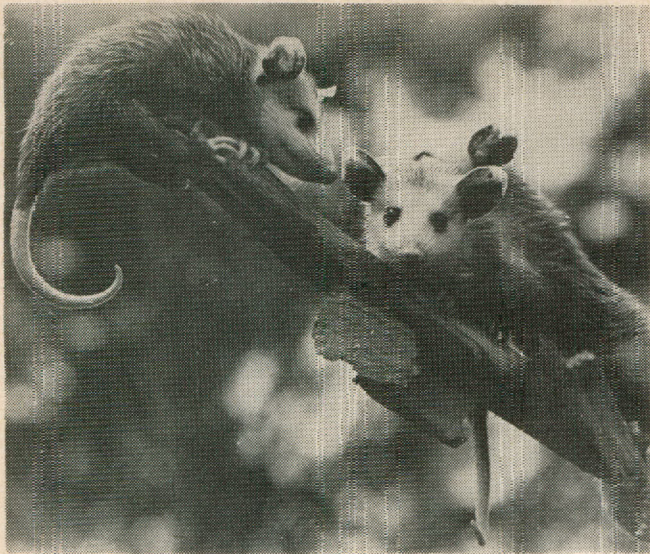
At birth the young are quite undeveloped and for all practical purposes are still embryos. They weigh 1/270 of an ounce each and are so small that a litter of 16 may be nicely accommodated in a tablespoon!

Immediately following birth the hairless, grublike youngsters squirm their way to the nipples in the mother's abdominal pouch by following a trail of milk trickling through the mother's hair. Once arrived in the pouch, formed by folds of skin on each side of the mammary glands, the young fasten onto the nipples (usually numbering 13) which become so swollen inside the youngsters' mouths that they cannot be shaken loose. Some 60 to 70 days later, the young have developed hair and may occasionally venture outside the pouch. After a lapse of 90 days, the young weigh around eight ounces and are able to forage well for themselves. By the following February they are mature and ready to produce young of their own.

The adults weigh from four to 12 pounds, with males running slightly larger than females, and average about 2½ feet long from the nose to the tip of the tail. The tail, about 12½ inches long, is prehensile, another peculiarity of the opossum shared by no other North American mammal. This ability to wrap the tail around a limb and hang on undoubtedly comes in very handy to the tree-loving opossum. Other peculiarities possessed by the opossum, and found in no other wild mammal on this continent, include a grasping, clawless thumb on



At the left, a honey bee, as compared with a newborn opossum on the right. It takes 4,320 infant opossums to weight one pound. (Courtesy Louisiana Conservationist.)



Peculiarities possessed by the opossum and found in no other wild mammal on this continent, include a grasping, clawless thumb on the hind foot, and the most teeth, numbering 50 altogether.

the hind foot and the most teeth, numbering 50 altogether.

Like most prolific animals, the opossum probably lives a relatively short time. Although he has been credited with a life span of as much as eight years, some observers feel that his life in colder climates may be considerably shorter than this under wild conditions. In support of this view, they point out that immediately following a fairly severe winter many opossums are seen with goodly portions of their ears and tails frozen off. Yet in the fall practically all, if not all, opossums have ears and tails in whole and healthy shape. While opossums are known to investigators to be able to regenerate a certain amount of ear tissue lost through such mishaps as the pulling out of ear tags, it is doubtful they can regenerate all lost tissue to original condition, or grow a good portion of a new tail.

The presence of opossum meat, probably mostly carrion, noted in several food-habits studies of the opossum would seem to lend credence to this short-life theory. Such a postulation would indicate a possible life span in the wild that included only one severe winter.

Seldom seen in daytime, this animal is a nocturnal prowler like many others of a predacious nature. Although the 'possum—when he is not being chased—moves scarcely faster than a turtle, he does a lot of rambling around, especially on fairly warm, calm nights in autumn and winter when the moon or stars are shining. At such times he is foraging for food and may travel a circuitous route of one to two miles before sunrise.

Truly an omnivorous animal, the 'possum will eat practically anything edible. However, food-habits studies indicate that it prefers animal food material, particularly insects. It also consumes fruit and grains and includes in its diet such morsels as angleworms, snails, lizards, snakes, crayfish, slugs, and carrion from any kind of dead animal carcass it may find, including opossum carcasses. While it

is commonly taken for granted that the 'possum is somewhat of a chicken thief, studies of its food indicate that this reputation is largely undeserved.

"For anybody as has any kind of dog, 'possum huntin' is made to order," says an old fellow down on the creek. According to him, "just any little old dog can make a passel of fun out of a 'possum or two—and you can't beat fun." Somewhat more discriminating dog men seem to take the view that a hound with no value for anything else makes a good 'possum dog. Most full-blooded hound dogs, some say, become stronger on 'coon or other game than on 'possums. Certainly there are plenty of mixed bred dogs—shepherd crosses, common farm canines and the like—that love to tree a 'possum. Some Southerners favor a bulldog-hound cross and it is generally conceded that a little hound blood mixed in a dog is to be desired, as it gives the dog a better nose and might even impart more "music" to his voice.

Running 'possums isn't much of a chore, as most folks know who have ever treed one. If the 'possums are there, they take up just about the nearest tree, and that is usually a sapling. If they tackle a big tree, they generally get themselves out on one of the lower limbs. Rarely do they run more than "half a quarter." This lack of enthusiasm for the chase is often interpreted as another shortcoming in intelligence. In fact, early observers branded the animal as "a silly grinning idiot."

In the early 1900's, a naturalist measured the brain capacity of a 'possum skull by filling it with beans, to compare its equipment with that of a similar-sized raccoon. The opossum's wit-box held only 25 beans, while that of the raccoon measured 150 bean-power.

Those who harvest furs by trapping generally agree that the 'possum can get himself caught in almost any kind of trap-set. Probably the majority of 'possum pelts are taken accidentally while trapping for more valuable furs. In his *Lives of Game Animals*, 1929, Ernest Thompson Seton writes:

"The 'possum is the most hopeless fool of the woods . . . and when caught by some hard-gripping steel, it has not wits enough even to get mad; it simply looks bored, scared and non-resistant. We find in this a melancholy proof that, in the struggle for life, wits count for less than fecundity.

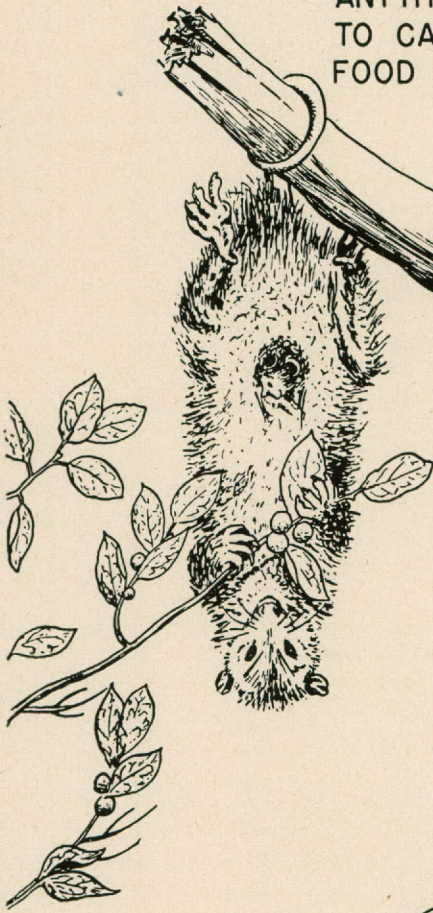
Regardless of 'possum-inspired philosophy and of what it takes to catch him, from the numbers of furs sold it would appear that 'possums are somewhat easier to catch than muskrats and at least twice as easy as any other furbearer. At any rate, this seems to be the case for the past ten years or so, during which time we have enjoyed a relatively high 'possum population.

More recently, however, during the past three seasons, the average take has fallen off about 48 per cent from the average harvest for the previous seven years. This might seem like we have been either harvesting too many or else 'possums are in a "low" period in their cycle. However, it should be considered that the past three years have also seen less activity on the part of fur-takers, due to low prices and due to a closed mink season in 1948-1949.

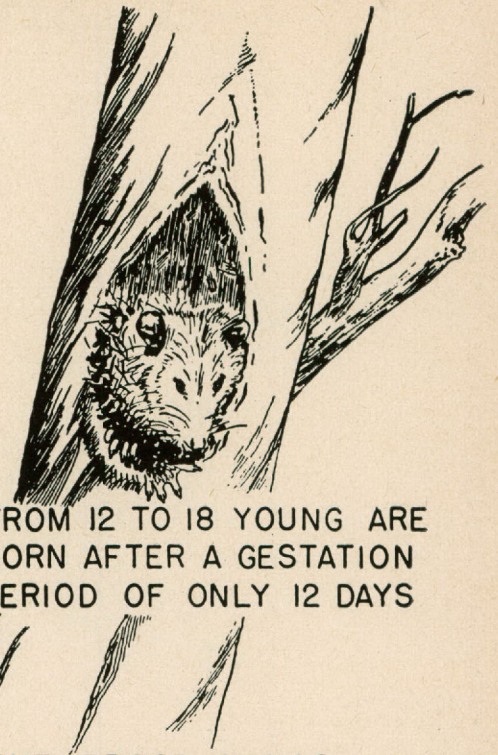
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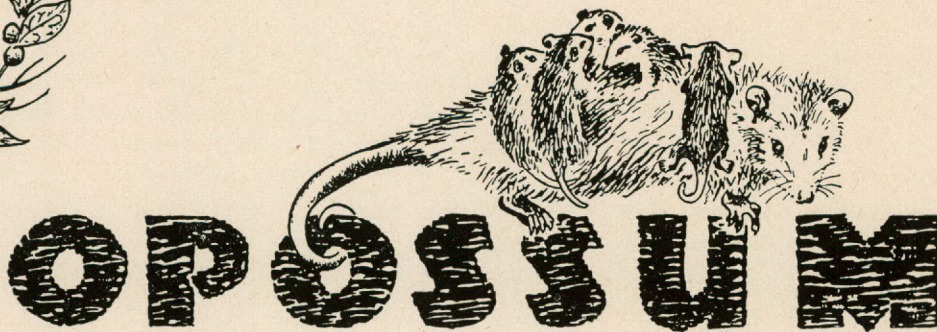
ANYTHING FROM LEAVES  
TO CARRION SERVES AS  
FOOD FOR THE OPOSSUM



FROM 12 TO 18 YOUNG ARE  
BORN AFTER A GESTATION  
PERIOD OF ONLY 12 DAYS



WHILE ONE BROOD CLINGS  
TO MOTHER'S FUR ANOTHER  
MAY BE CARRIED IN THE  
POUCH BENEATH HER BODY



WHEN ALARMED A 'POSSUM  
PLAYS DEAD UNTIL SURE  
THE DANGER HAS PASSED

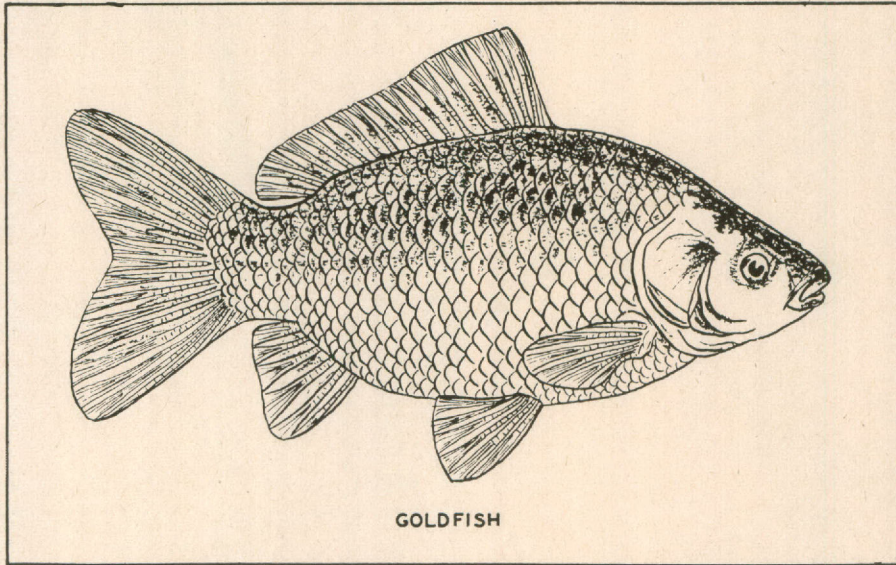


SMALL AS HONEY BEES AT  
BIRTH - 'POSSUMS GROW TO  
THE SIZE OF HOUSE CATS

*Courtesy Wildlife in North Carolina*

# Fishes of Texas

By MARION TOOLE  
*Chief Aquatic Biologist*



**M**OST of the readers will be surprised to see the goldfish listed as one of the fishes of Texas since the goldfish is usually considered an ornamental fish. Yet all goldfish in Texas are not confined to little glass bowls, aquaria, and lily pools, but are also found in lakes and ponds vying with the other wild fishes for their livelihood. Of course, all those found in a wild state are either fish or offsprings of fish that have been released by humans, since goldfish are all descendants of immigrants to the United States and did not occur naturally in our country.

The history of goldfish is an interesting one. They were probably the first species of fish that was artificially propagated by man. The Japanese knew of ornamental goldfish in 1500 A. D., and countless years prior to that date, the Chinese had been breeding the drab common goldfish into the creations of beauty that the Japanese first saw.

One of the first records of their introduction into Europe states that

about the middle of the eighteenth century some goldfish were brought into France from China and given to the famed courtesan, Madam Pompadour.

It was as recent as 1878 that Rear Admiral Daniel Ammen, U. S. N., brought the first ornamental goldfish from the Orient to the United States.

Since then so many goldfish have been introduced from both the Orient and Europe and so many millions produced in the United States, that now they are very common.

Many people think that goldfish are just the European carp, also imported from Asia, that have been developed by breeding into the many varieties of goldfish that are known today, but this is not so. The goldfish is a distinct genera, even though the early ancestors of those beautiful fishes we think of today as goldfish were not always colored. The original root-stock is a drab fish colored from silver-gray to olive green. Its general appearance is like just any common fish. It can easily be distinguished

from the carp because the goldfish doesn't have the fleshy barbels at the corner of the mouth, which the carp has. It is covered with large coarse scales and has small fins. The original fish still abounds in China and occurs wherever goldfish have been introduced. The offsprings of domesticated varieties that have been released from captivity show a tendency to revert to the appearance of their wild ancestors.

The original wild goldfish display a definite trend toward albinism which causes some of its members to lose their olivaceous coloration and to present different color aspects, such as white, gold, red, or mixed colors. By carefully selecting these sports or mutants and breeding them over a period of many years, the beautiful colors were fairly well fixed.

Other mutations occurred through the years, and the breeders were careful to take advantage of these modifications also. These mutations were split tails, lack of dorsal fin, transparent scales, long flowing fins, pop

eyes, and raspberry-like growths on the fish's heads. These mutations, like the coloration, have been fixed so that definite varieties of goldfish have been developed.

When the fish has a long body and fins, especially a long flowing tail or caudal fin, then the variety is a comet.

Should the fish appear scaleless, caused by possessing transparent scales, and be colored blue, which in turn is mottled with red, yellow, brown, or black colors, then the fish is a Shubunkin.

Some goldfish are similar to the comet inasmuch as they have long bodies, but the tail or caudal fin is split into two separate tails and the anal fin is double. These are called fantail goldfish.

Another variety of goldfish has a short, rounded chunky body. The caudal and anal fins are double like those found on the fantail, but all fins are extremely long. The dorsal fin, or fin on the back, is high. These goldfish are fringetails. Some fringetails are scaled and others have transparent scales and are called scaleless fringetails.

Should a fringetail fail to have the double tail and anal fin, then it is called a nymph.

When the eyes protrude, the goldfish in question is considered a telescope goldfish. One variety of telescope goldfish, the celestial telescope goldfish, not only have protruding eyes, but they also have pupils on the tops of the eyeball, thus causing them to constantly look skyward. These latter fish are also without a dorsal fin.

Another variety of goldfish is black with the exception of the underside of the belly. These are the Moor telescope goldfish. Occasionally one of these black Moors will turn gold.

Two varieties of goldfish have the thick raspberry-like growths covering their heads and gill covers. These are the lionhead goldfish that are without a dorsal fin and the oranda that has a dorsal fin.

In ponds, the goldfish present very little trouble to the owner, mainly because of the bountiful supply of their natural food, algae, aquatic insects, etc., which is produced, and because

oxygen is present in sufficient quantities. It is necessary to have a few types of plants other than lilies growing in the ponds. A small portion of sagittaria or vallisneria should be planted to serve as oxygenators and cover for the young fish; if breeding is desired, water hyacinths and myriophyllum should be present. All of these plants are available from aquarium supply houses. Sagittaria or vallisneria should be planted in sand or grit, care being used to see that the crown of the plant (the crown is the portion of the plant where leaves are attached to roots) is just showing from the surface of the sand. These plants spread rapidly from runners and in a very short time form a bed of plants. The myriophyllum can be planted or left to float and the water hyacinth is a floating plant.

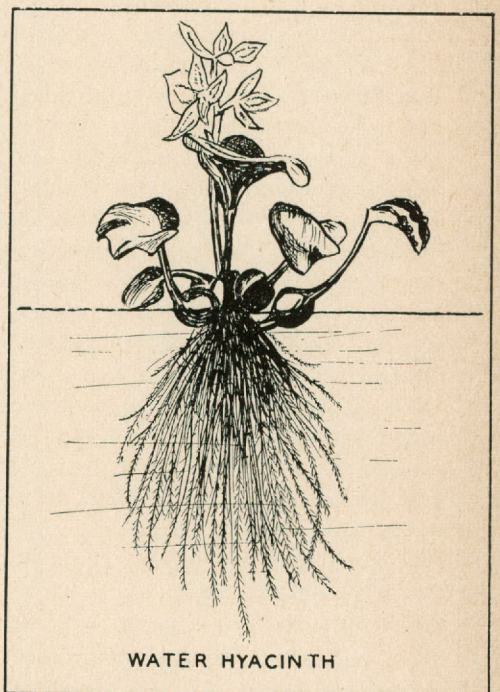
Artificial foods that may be used include ground-up dog biscuit, either uncooked or cooked oat flakes, dried bread, powdered shrimp, boiled spinach and fish foods prepared by fish food manufacturers. Live food that is desirable include daphnia or water fleas (hard to collect in Texas), and chopped-up earthworms. A daily feeding of artificial food will suffice. An occasional meal of the chopped-up earthworms is beneficial.

In order to keep goldfish in bowls or aquariums, however, much effort is required. Trouble is usually encountered because most people try to use containers that are too small. This results in overcrowding and overfeeding which causes subsequent pollution of the water. Both factors result in a depleted oxygen supply with suffocation of the fish the final achievement. If you have a desire to keep goldfish in the house, try to procure as large a square or rectangular aquarium as possible. These should have washed and rewashed building sand placed in them one or two inches deep and placed so the slope from all directions is to the center front. Hard rocks, insoluble in water, can be used for ornamental purposes. Then plant vallisneria and sagittaria, as previously directed, around the sides and back. Next, fill with water, first laying a newspaper over the sand in the bottom and slowly running the water into a saucer or the palm of your hand. When full of water remove the

paper and you usually have a crystal clear tank. Because of chlorine present in most municipal drinking waters, it is best to wait a day before introducing the fish, in order that the chlorine gas might dissipate.

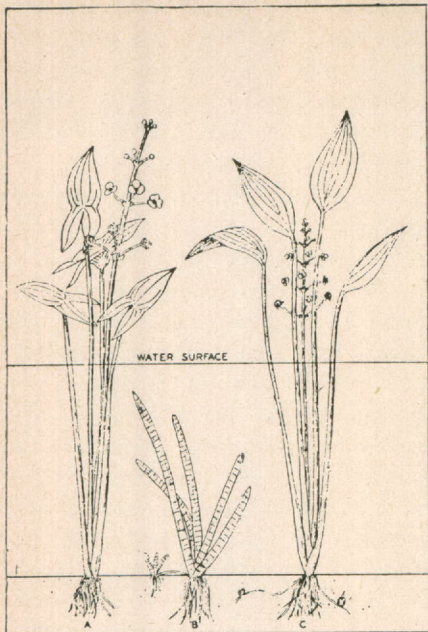
You are now ready to put in your fish and it is here that troubles usually start, because the tendency is to install too many tenants. It must be remembered for safe results, you should have one gallon of water for each inch of goldfish. It must be remembered that this rule applies to a square or rectangular aquarium and one not too deep. The depth should be only one-half the length of a long aquaria or three-fourths of the length of one medium-sized. With the above setup, it should not be necessary to change the water over twice a year, at the most. As dirt works to the front, siphon it off and add fresh water to keep your tanks full. Razor blades can be used to clean the algae or green scum off the glass sides. As to feeding in an aquarium, feed sparingly. Be sure your fish eat what you feed and siphon off the bottom any food remaining an hour after feeding.

Some fish show what are known as secondary sexual characteristics. Fortunately, this is true with goldfish.



WATER HYACINTH

The water hyacinth is a floating plant and should be present in the pond if breeding goldfish is desired. The eggs are deposited on the roots.



**DUCK POTATO, Arrowhead, *Sagittaria* showing different types of leaves; A, arrow shaped, *Sagittaria latifolia*; B, tongue-like; C, elliptical shaped, *Sagittaria platyphylla*.**

Before and during spawning season from January through August, the males possess small spawning tubercles on their gill covers or plates. These are like small pistules that can be readily detected by those familiar with goldfish. The females can be detected by their rotund shape, getting larger as spawning season approaches. It is just prior to spawning season that the fish should be fed a diet of finely chopped earthworms to condition them for spawning. The ideal spawning method is to place one female and two males in a separate tank or pool with a number of water hyacinths or a thick mass of floating myriophyllum. The eggs are deposited on the roots of the hyacinths or the fine moss or leaves on the myriophyllum and appear as small amber balls. Unfertilized eggs soon turn white and a coat of fungus develops. Since an average output of eggs is around 700, a goodly number of fry will be obtained even though some of the eggs are not fertile and some will be eaten. The parents should be removed and the eggs left to themselves, otherwise the parents will eat them. Snails will also eat eggs so they should not be present. The length of time for hatching depends on the temperature and requires from four to ten days. In several days, the yolk

sacs are absorbed and then the fry must be fed on microscopic food. This food must be prepared when the eggs first hatch.

One method is to pour scalding water over some dry hay and then place in a large jar filled with water. If a little pond water is added it will cause quicker production of the protozoans (microscopic animals). A little of this water should then be poured in the nursery tank each day. The writer has had exceptional luck by boiling an egg for about eight minutes, taking out the yolk, mashing it, placing it in a clean vinegar bottle filled with water and shaking it until the yolk particles are evenly dispersed through the water. The proportion should be one egg yolk to a pint of water. This yolk water can then be poured into the tank of fry when they reach their free swimming stage. Too much at a time should not be used, so pour in a very small glass full twice daily. After the young fish get larger, start-feeding them on cooked oatflakes, strained through a sieve and again be careful not to overfeed.

In a large pond where other fish are present, your hyacinth roots or myriophyllum should be examined twice daily during spawning season, and if eggs are detected, place the plants in another container for hatching and rearing. Containers that can be used for hatching are old wash tubs, both galvanized and wooden, and other concrete pools. A warning should be given: never use a new wood tub or trough until it has been treated with lime for about a week; a new galvanized tub until all newness has disappeared; and any new concrete structure until it has first been treated with glacial acetic acid for a week or so, using about two gallons of acid to one hundred gallons of water. Furthermore, be sure all traces of the treatments are disposed of by thorough scrubbing and washing. If this warning is not heeded, death to both fish and plants will be the result.

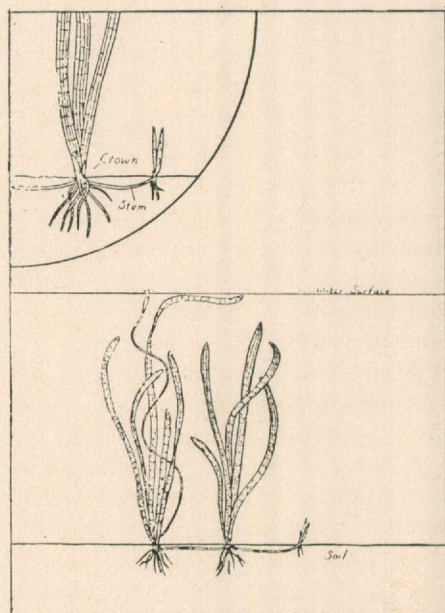
Fish are subject to many diseases, some of which may be cured. Following are listed a few of the most important regarding goldfish, along with the treatment for each. Remember when a sick fish is observed remove

him at once because most diseases are contagious. The best type of vessel in which to treat fish are white enamel baby baths or large dishpans.

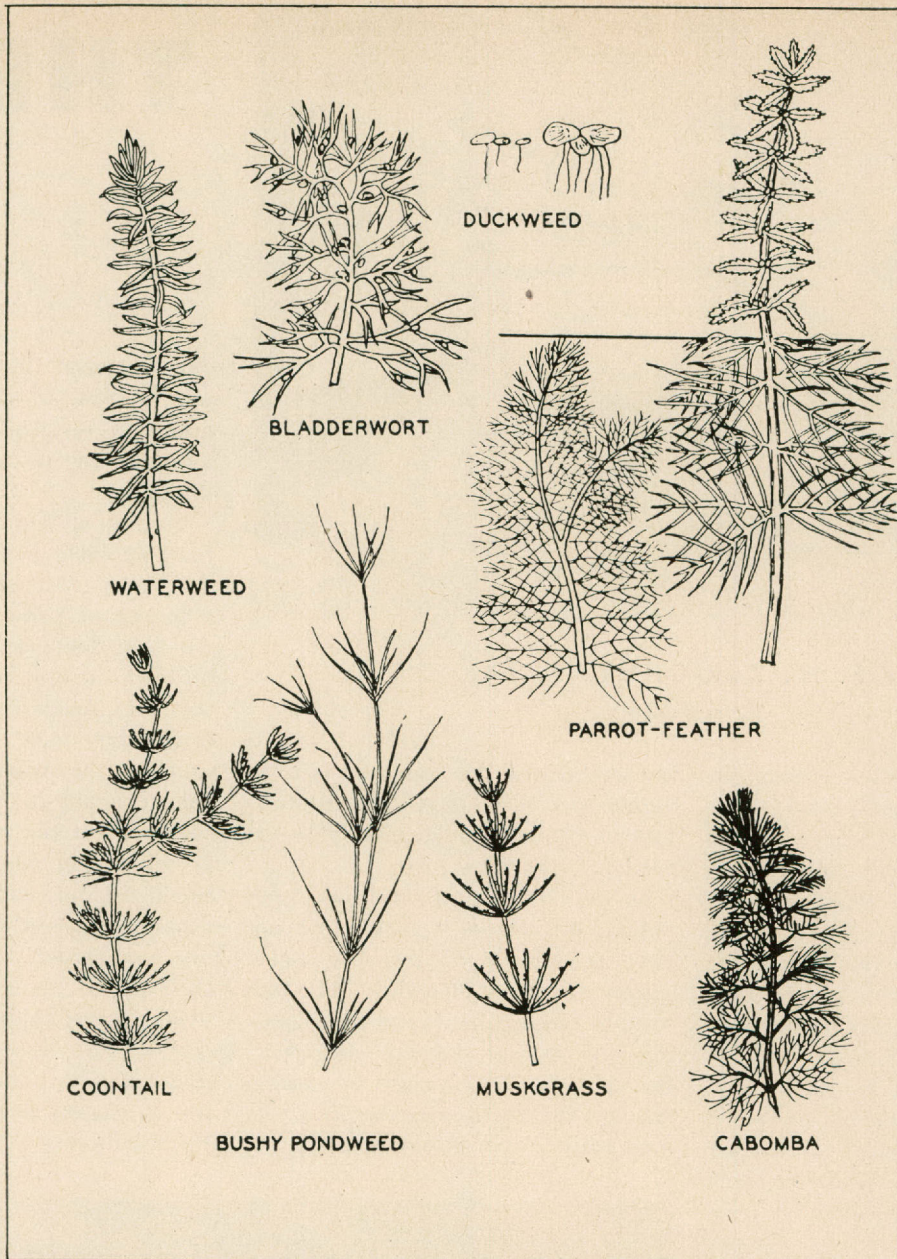
*Fungus*, usually a secondary disease, i.e., follows some other injury or disease, is easily detected. The *symptom* is a white cotton-like scum starting on the fins and spreading over the body, destroying the fins and eventually killing the fish. For *treatment*, place two heaping teaspoonsful of crushed rock crystal salt (ice cream salt) to each gallon of water. Fill baby bath or dishpan about half full of this solution and place fish in it. This solution should be changed daily. The fish will live in this strength solution all right. If in several days no improvement is noticed, increase the amount of salt to three heaping teaspoons of salt to the gallon of water.

*Constipation*. This ailment can usually be controlled by dropping in a pinch or so of Epsom salts crystals every week. The fish will eat the crystals as they fall through the water.

*Fish Lice (Argulus)*. A small flat scalelike animal slightly tan in color can be seen crawling over the fish. They are found from the size of a pin head to about one-fourth inch in diameter. *Treatment*. If not many are present, picking them off with tweezers is effective. Chemical treatment which is dangerous to use, consists of



**WILD CELERY, Tape Grass (*Vallisneria spiralis*). Always set out rooted plant so that the crown is not buried under the soil.**



**VARIOUS AQUATIC PLANTS found in Texas. Waterweed, *Anacharis canadensis* (Elodea); Bladderwort, *Utricularia*; Duckweed, *Lemna*; Parrot-feather, *Myriophyllum*, showing different leaf formations; Coontail, *Ceratophyllum*; Bushy Pondweed, *Najas*; Muskgrass, *Chara*; Cabomba, *Fanwort*, *Cabomba caroliniana*.**

using one-eighth grain of potassium permanganate to the gallon of water in a clean container. If used in a pool with plants and detritus present, one-half grain to a gallon of water can be used. The treatment will have to be repeated for several weeks, a week apart.

**Anchor Worms.** These are small white stalks, the size of thread which can be seen protruding from the scales. **Treatment.** They can be picked off with tweezers and the spots painted with two percent mercurochrome. A chemical treatment is potassium permanganate as directed under fish lice.

Another treatment recommended is four drops of two percent mercurochrome to a gallon of water.

**Ichthyophthirius** is caused by a small protozoan. These small animals encist under the protective fish skins and form white spots about pin point in size. They spread rapidly all over the body. **Treatment.** Raise the temperature of the water to at least 80 degrees F., and treat with treatment of potassium permanganate as directed before. Another recommended treatment is the mercurochrome treatment of four drops of 2% solution to the gallon of water. It has been cured

with the salt treatment, using three heaping teaspoonsful to the gallon of water.

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Recommended for complete details regarding goldfish care and culture.

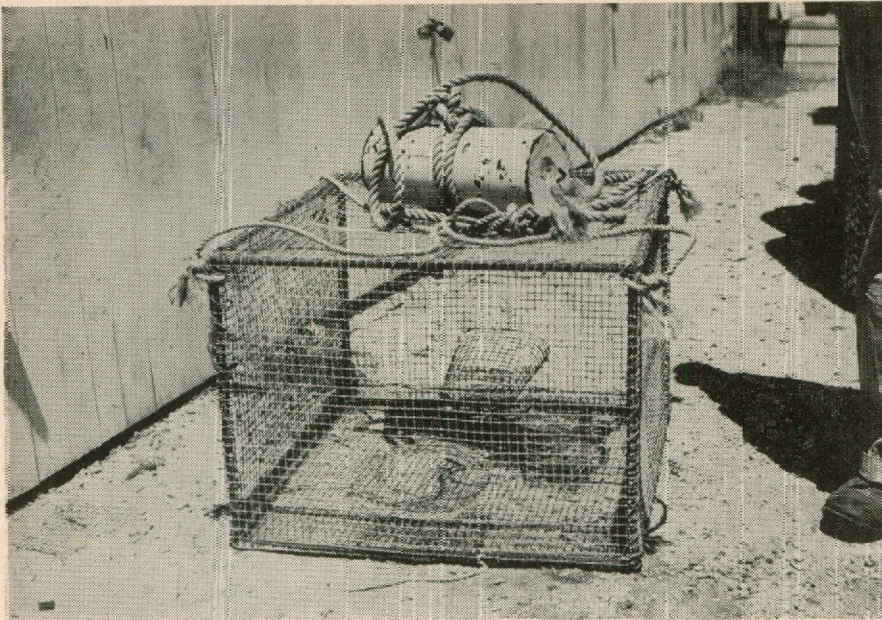
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# THE BLU



By F. M. DAUGHERTY, JR.

Marine Biologist

**S**URE, you can buy crabmeat in restaurants, hotels, and sometimes in markets; but where does it come from? Our production reports reveal figures so low that an entire year's catch could in all probability be consumed within our own state boundaries in less than a week. Of course, the direct marketing methods employed in Texas prevent the attainment of a true production picture, but even if it were possible to record every ounce of crab meat taken from our waters, we would still fall short of the demand. Consequently, it is necessary to fortify our own meager catch with shipments from Chesapeake Bay and from our neighbor, Louisiana.

Why is Texas unable to meet its own demands for crabmeat? Is the crab population too sparse to support a fishing of such magnitude?

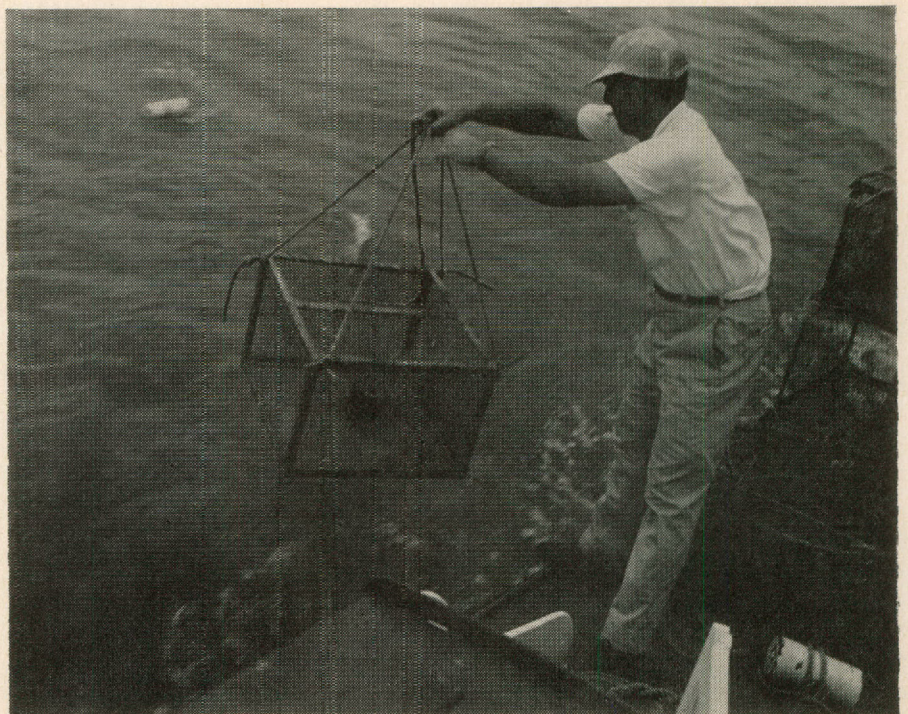
I do not believe that there is a scarcity of crabs despite the failure of an organization to establish a large scale industry in the Aransas Pass area in 1945-46. This company was, in a manner of speaking, doomed before it started, for their initial equipment expense and day to day overhead was so high that a slack mid-summer season was ruinous. The fish-

ing methods of this company were so highly specialized that any modification or change would have been too costly.

If we do have an adequate crab population, why is it that we do not have an industry of sufficient size to supply the local demand? The answer to this can be found by reviewing our major fishery, shrimping. Basically we are a state of shrimp fishers. Shrimping can be very remunerative, and is so attractive to

our fishermen that it is almost their sole interest. Most of them have no desire to supplement their earnings by crabbing or any other type of fishing.

Studies of the blue crab indicate that we have a crab population on the Texas coast which would support a fishery of sufficient size to supply our own demands and would probably furnish some for shipment out of the state. As evidenced by the failure of the large scale crab fishing organization in the Aransas Pass area, large fleets exerting intensified fishing pressure are not the answer to sustained production in our waters. Numerous small organizations of one or two fishermen operating widespread over our vast coast line and marketing their catch to regular fish houses would probably be much more successful. This is certainly not a "get-rich" plan, but with honest endeavor should furnish acceptable incomes to the fishermen.



Above is a detailed view of the crab trap used by the author. To the right, he "plants" the trap in Cedar Bayou.

# CRAB,

## a Neglected Resource

The initial expenses of such a fishery would not be great, or at least would not be prohibitive. Fishing equipment would be simple and inexpensive, consisting of traps and trot-lines. Of course a boat would be necessary, but a motor skiff or even an out-board powered craft of some kind would suffice.

Crab traps and trot-lines have both been mentioned as fishing methods. It would be desirable to be equipped for both methods, thus allowing more versatile crabbing.

Traps are more expensive as far as original cost is concerned. They are usually constructed of double galvanized, 18 gauge, one and one-half inch mesh chicken wire. A cube 24 inches on the side is formed with a four inch bait box located in the center of the bottom and two funnels, of one inch mesh chicken wire, on opposite sides. The funnel openings are roughly oval in shape, eight inches wide by five inches high at the outside opening tapering in six inches to a five inch by three inch inside opening. A partition is usually placed about eight inches from the bottom of the trap forming a shelf on each side and then curving upward for eight additional inches in the center, with two six inch by three inch openings at the top of the curve. This partition allows the crabs to work up to the top of the trap, thus freeing the lower chamber for the entrance of additional crabs. Traps of this type may or may not be framed with three-sixteenth inch iron rodding. Framing increases the cost of the trap, but makes it more durable and facilitates handling. A framed trap usually requires no anchor. Small

floats are attached to the traps to act as recovery markers. Traps should be placed 100 or more feet apart, either in a line or in parallel rows.

Trot-lines used in crabbing consist of a line, one-fourth inch in diameter, which may be a mile or more in length. Baits are tied directly into the line at three to six foot intervals. Lines are buoyed and anchored at each end. The bait for this type of rig has to be larger and tougher than that used in traps. Very often salted bait is used and should be held in reserve for use when fresh bait is not available. As a rule, in this type of fishing, the line is picked up by running it through a system of rollers, one horizontal roller crossed by two vertical rollers, mounted on the side of the boat. Crabs are picked off by means of a dipnet covered with chicken wire instead of cord webbing or a large wire scoop arrangement may be used to catch the crabs as they are knocked off of the bait. This

latter method is more costly and causes some confusion in separating the catch as to size.

Bait is always a problem in crabbing, with trap presenting somewhat less of a difficulty than trot-lines. Most any waste fish parts, if fresh, are good. The scrap fish such as shrimpers shovel overboard are excellent. Indeed, the use of these scrap fish as crab bait might put an end to the tremendous waste that is common in our shrimp industry today and supplement the shrimpers earnings as well.

So, we have a potentially large natural resource, which for the present is neglected. Perhaps in the not-too-distant future our fishermen will in part turn to crabbing as the pressure on shrimping increases and additional earnings will be necessary. When and if that time comes, we will be able to furnish our own crab meat demand. As all good Texans would say "That's as it should be."



The author tabulates important blue crab data for future study at the marine laboratory at Rockport.

# Notes on the

**T**HE BIG GAME hunting season which closed the last day of December was one of the most successful in recent years. In fact, it was probably a record season since more hunters successfully bagged their deer than ever before. Turkey hunters were somewhat less successful. Many of the big birds changed their range at the last minute much to the chagrin of the nimrods who had them spotted. Biologists tell us that this is often the case. Deer, however, usually

stay put and even starve to death rather than move to new ranges.

The hill country was again host to the majority of hunters. They found deer numerous and in good condition. South Texas—the big country where the big deer with big horns come from—was disappointing to some hunters, especially those who came early. The weather was hot and dry and generally unfavorable for deer hunting.

The 1950 antelope season which was held in the Trans-Pecos from

the second of October through the tenth, was very successful for those applicants who were lucky enough to receive licenses. However, 244 applicants were disappointed since there were not enough permits to go around.

Early reports indicated that about 600 surplus bucks would be available to hunters. But when biologists got down to the business of actually counting them, a job done from small observation planes, it was found that only 422 bucks were available. The shortage last fall was attributed to the severe winter the year before.

Out of the total number of permits issued, 20% or 85 licenses were allotted to landowners. Without going into higher mathematics, it is easy to see that only 337 were left for Mr. Average Hunter. Almost all of the license holders had good luck and brought back fine trophies as well as plenty of good steaks and roasts.

There were two seasons that went unnoticed by many a Texas nimrod, but not East Texans, for it is in their part of the state that rails and woodcocks are found. Rail season opened on September 1 and extended through October 30. After these birds, some of which are about the size of a small fryer, have been fattened in the rice fields, they make very good eating and sometimes pretty tricky shooting. Hunters, rugged enough to wade the marshes and flooded rice fields, reported the birds abundant and in good condition.

Woodcock shooting was something new in Texas. The past season in certain East Texas counties was the first open season in the



San Antonians John R. Massey, Sr., and C. N. Kennedy, top left photo, display their bag of geese brought down in a rice field near Port Lavaca. These Valleyites, bottom photo, had good luck on a deer hunt in the Hill Country. They are left to right, A. L. Pittman, Donna; A. J. Kessler, Alamo; W. A. Todd, Albert Kammer, Cleo Vineyard, and Ed Capen, all from Donna.



# Hunting Season

state since 1918, except for a very short period in the 1930's. An apparent increase in the population of this migrant prompted the Fish and Wildlife Service to go along with the state's recommendation for a short open season this year.

Some goose hunters were discouraged because of an outbreak of aspergillosis early in the season. Aspergillosis is a disease common to poultry and caused by inhaling the spores of fungus sometimes found on waste grain. Only very few geese were affected and the sick birds were soon eliminated. Despite this early disappointment, goose hunting along the coast was excellent. The shortage of water caused them to concentrate where fresh water was available. Hunters who had access to such concentrations enjoyed the best of good goose hunting and found their game in excellent condition.

Duck hunting left much to be desired. Drought along the coast and through eastern and central Texas converted many a favorite duck pond into a miniature dust bowl.

The quail season was a disappointment to many of the advocates of this sport. In most of the state there were plenty of quail but dry, hot, dusty pastures gave the old pointers and setters a bad time. They could do little more than sneeze and try again. And as most quail hunters will tell you, there is not much sport to quail hunting without a dog. The quail hunters seem to be the hard luck boys of the hunting fraternity. Season after season they wait for a bumper crop. And then, when one occurs, the weather conditions make hunting them next to impossible.

Dove hunters began their season early in September when 203,440

whitewings were killed during the three-day open season in South Texas. The opening of the North Zone mourning dove season found plenty of birds available. The late arrival of cold weather and the availability of food and water probably caused the birds to delay their migration southward. Dove hunters in the South Zone did not fare as well. They did not find the concentrations of birds they found in former years. Native dove food producing plants failed to mature and make seeds because of the drought in South and Central Texas.

January 16th, the last day of the

quail season, ended another hunting season for most Texans. However, a few veteran squirrel hunters will still be stalking old twitchy-tail. But the wise squirrel hunter will consult his special county law before he takes to the woods, for certain counties are closed during the late winter and early spring months.

With their guns carefully laid away, outdoorsmen in Texas will be concentrating on fishing. There will be tackle to check, rods to varnish and new lures to be made in preparation for the first fishing trip of the year. —Editor



Perfect kills were made by these nimrods early in the season. Albert Minten, top right, got his two bucks on the John P. Minten ranch near Falfurrias. The hunters in the bottom photo are left to right, Ronnie Davis, Conroy and Clarence Hughes, and L. C. Davis, all from Beaumont. They were hunting on the R. L. Allen ranch, Junction.

# The Marine Fishes of Texas

By J. L. BAUGHMAN

Chief Marine Biologist

**T**HIS shark, *Carcharhinus porosus*, which has no common name, is distributed generally throughout the tropical regions of the Western Atlantic, and from Brazil to the northern Gulf of Mexico. It is also found in the Pacific from Peru to Panama. This, or a similar form has been caught on the northern coast of Africa.

In Texas it has been caught at Galveston, Port Aransas, and in the Laguna Madre.

It is generally leaden or bluish gray above, with the sides sometimes tinged with red. The edges of the lower fins and the hind edge of the lower tail are white.

The largest on record was 49 inches in length.

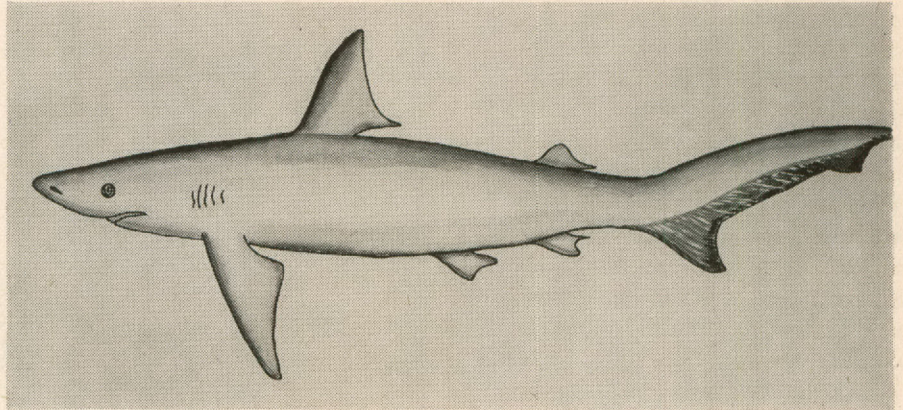
No data are available on food, breeding, or habits.

The black-nosed shark ranges throughout the western tropical and subtropical Atlantic from Rio de Janeiro to North Carolina. The shark fishery at Salerno, Florida, used to take them in considerable numbers, and it

has also been caught at Biloxi, Mississippi.

In Texas the one and only specimen known came from near Corpus Christi.

Little is known of its habits. The Cubans use it as food.



Both species have similar external characteristics.

## WILDLIFE MOVIES

**E**ARLY in the twentieth century, Americans were mystified by a new invention called the Kinetoscope. People in all walks of life watched with wonderment at a make-believe hero rescuing the fair maiden from a shadowy villain. This was the beginning of a great medium of entertainment—the movies. Few of these people realized that they were also witnessing the beginning of a new medium of education. Ironical as it may seem, the potentials of movies as an educational aid were not fully realized until the beginning of World War II. At this time it was necessary to train millions of men as quickly as possible for specialized work. Time was a valuable weapon. Through visual training “rookies” learned many lessons of warfare;

thus saving valuable teacher man hours.

After World War II, the educational screen emerged as a valuable teaching aid in peacetime. Realizing the importance of motion pictures as a medium of education and entertainment, the Game, Fish and Oyster Commission laid plans for a more complete film library. New pictures were produced, and today Game Department photographers are busy grinding out more.

Supply, however, has not yet met demand. Hundreds of requests for film bookings are received by the division of publications each month. During the 1950 calendar year, over eighty-six thousand persons, including school children, sportsmen and members of civic groups witnessed free screenings of Game

Department movies. “Master Whitetail,” completed in July 1950, had an audience of about twenty-three thousand. The runner-up, “Roadrunner Battles a Rattlesnake,” was seen by over fourteen thousand viewers.

Future plans for production encompass a wide variety of wildlife subjects including many of Texas’ animals and fish, their habits, habitat and problems of management. All will be photographed in color and sound.

For those who are not familiar with film subjects in the Game Department library, the film department makes available a free listing of all titles. Films may be had without charge, the borrower paying only return transportation charges.

# BRUSH SHELTERS—

## A Method for Improving Fishing

By KENNETH C. JURGENS

*Aquatic Biologist*

LIKE all lakes which are subject to great and sometimes violent fluctuations in water level, Lake Travis is essentially without vegetation. Since this lake was primarily intended for water storage and flood control, it is not likely that the water level will ever be stabilized. Under such conditions, where the water level may vary as much as thirty or more feet in a year's time, aquatic vegetation finds the greatest difficulty in surviving. Plants which might gain a foothold in such a lake will either find themselves high and dry, where the sun's heat can destroy them, or flooded to the point where they are deprived of the energy of sunlight which is necessary for their life.

In lakes of this type there are generally few places where plants find conditions favorable to their survival. Usually these places have a bottom, the bottom of which is very slightly sloped and is composed of bottom materials suitable to normal plant growth. In such places it is possible for aquatic vegetation to continue growing by keeping just ahead of or just behind the falling or rising water level. This is especially true if the change in water level is gradual, even though extensive. One such area in Lake Travis is the sand flat immediately across the lake from the mouth of Big Bee Creek. This area has a comparatively heavy growth of coontail-moss.

The general lack of vegetation in flood control lakes affects fishing in several ways. Young game fish, as well as the small fishes which serve as food for them, are constantly open to predatory attack by larger fish simply because there is no cover in which to hide. This state of affairs could possibly lead to a serious depletion of the forage fish population and a slowing down of the growth of game fishes. If cover was available it would not only provide places of protection for small fish but also places to which larger game fish would be attracted. This is especially true in the case of the crappie or white "perch." In addition, this cover would provide an abundance of breeding places for minnows and aquatic insects. Thus, the lake would produce more of the potentially possible food crop. Unfortunately this vital cover cannot be provided in the form of water plants but it can be provided on a small scale in the form of brush shelters.

Contrary to the belief of a great number of fishermen, the building of brush shelters and the baiting of these shelters with bales of hay or cottonseed cake is not illegal. There is nothing in the laws governing fishing which

prohibits this type of lake improvement.

Since flood control lakes are generally very large, it is an impossible task for one man or for even a small group of men to provide enough shelters to serve as cover for the entire shoreline. If fishermen and other interested groups combine in an effort to build brush shelters, they can in a relatively short time do much toward improving the quality of fishing in their favorite fishing holes. They should not, however, expect fishing to improve immediately though it will in due time.

Very little equipment or material, with the exception of brush, is necessary to build a satisfactory brush shelter. All that is needed are axes with which to cut the brush, some wire to hold the brush in place on a framework, staples to fasten the wire and a hammer with which to drive the staples. Brush, the most important item is already present in abundance along the shoreline as are rocks which can be used as anchors.

Scrub oak and desert willow are two types of brush which are present in quantity along the shoreline of Lake Travis. (Cedar is not too satisfactory in its early stages of decomposition because it gives off chemicals into the water which may drive fish away from the shelter.) Green wood is preferable to dry wood because it sinks more readily and the leaves, upon decay, will fertilize the water around the shelter.

Of the several types of brush shelters which can be built, the most effective types in a lake such as Lake Travis are the wind-row shelter and the tree top shelter.

The wind-row type of shelter is merely a long pile of brush about eight to ten feet wide, extending from the shoreline to a depth of twenty or thirty feet. In many places, where the water is expected to rise and flood creek beds or the heads of coves, these shelters can be built entirely out of the water. This type of shelter should in time provide good crappie and "perch" fishing. The results will be speeded if a bale of hay or some cottonseed cake is placed in the shelter.

If boat dock owners, camp operators and individual fishermen build these wind-row shelters and mark them with red painted floats, these floats will eventually become "sign posts" to better fishing.

Those fishermen who are partial to black bass fishing could help themselves to better fishing if they would cut and place a small tree top type of shelter somewhere along the shoreline each time that they go fishing. As

(Editor's note: Although this article was especially prepared for presentation at a meeting of Lake Travis fishermen, the methods of improving fishing described by the author apply to any large lake in Texas.)

● Continued on Page 31



An exceptional catch of 'coons taken on "Boss" Peterson's ranch in Kerr County. 'Ccons are believed an important factor in limiting the wild turkey population in the Texas Hill Country.

## Squirrel Ranks Second

Sportsmen who take a dim view of squirrel hunting on the basis that it does not provide enough "action" are really passing up a good bet in the field of outdoor sports, according to Gail Evans, Remington Arms Company, Inc.

"Comparatively few people realize the important part Mr. Bushy Tail plays in the hunter's scheme of things. The squirrel is hunted in almost every section of the country. He is hunted by adult and youngster and with almost every type of sporting firearm," says Evans, "but he is a hardy, prolific fellow who instinctively prepares himself against food shortages.

"In a survey which embraced the comparative popularity of different game species and the percentage of our sporting ammunition used in hunting each type of game, Remington's statisticians came up with some interesting figures which place the squirrel the Number Two target for shotgun shells. These figures do not include the percentage of 22 caliber bullets fired in his direction, but he unquestionably ranks high in that respect.

"Topping the list in shotgun consumption is the cottontail rabbit. More than 29 per cent of the shotgun shells manufactured each year are consumed in hunting this fleet-footed little fellow who is the most prolific

of all game animals. Even though more than twice as many shot shells are fired at rabbits than at squirrels, the squirrel ranks second with a percentage of 14, about on a par with the bob white quail. I am sure this information will come as a surprise to many sportsmen who deery the sport of squirrel hunting as not exciting enough. Once they've tried it they will very likely understand why many hunters find stalking this member of the Sciuridae family a fascinating pastime.

"Figures compiled by Remington revealed that the annual shotgun shell production is consumed in the following manner:

	Per Cent
Rabbit .....	29.6
Squirrel .....	14
Quail .....	13.9
Duck and Geese.....	10.5
Pheasant .....	9.5
Doves .....	7
Other Game .....	3.5
	——
	88.0
Trap and Skeet.....	12.0
	——
	100.0

"While these figures are not considered absolutely accurate, they are about as nearly correct as can be determined."

## Unlimber That Carving Knife

"Did you ever unlace a coney?" asks Henry P. Davis, public relations manager of Remington Arms Company, Inc. "The chances are you haven't, but if you've ever skinned out and carved up a rabbit you've come pretty close to it, for 'unbracing a coney' meant about the same thing in the language of sportsmen of the olden, golden days.

"In the days before this country became a nation," says Davis, "the art of venury had its wide and colorful vocabulary. All the phases of hunting and its allied activities were accompanied by niceties of formality, even though many were only nuances of speech. There was about as much ceremony in the preparation and serving of the game as there was in the bagging of it . . . and separate terms for each step. Even the art of carving had its own glossary. For instance, one did not simply carve a duck, he 'unbraced' it. Here are a few terms, all meaning 'to carve,' which Nash Buckingham, noted sportsman-author, passed along to me from an old shooting manual:

*"Rear a goose, unbrace a mallard or duck, unlace a coney (rabbit), wing a partridge, allay a pheasant, dismember a hen thigh a woodcock, display a crane, lift a crane.*

"In these rush-and-hurry days, the modern hunter is inclined to take his shooting with as few frills as possible. But if he would pause and allow the little things to coat his sport with a flavor of romance, he would find it far more to his liking."

### 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**

BOX 133

Phone 2-6234

PALESTINE, TEXAS

# Boy Scout Conservation Program Deserves Support

Conservation education activities will receive major emphasis in a national program of the Boy Scouts of America during 1951, the kick-off coming during Scout Anniversary Week, February 6-12, according to the Wildlife Management Institute.

Scout troops and explorer units will be encouraged to develop a conservation program beginning with an exhibit, demonstration or display during Scout Week. This may be an exhibit in a store window; a demonstration before a civic club, sportsman's group or other adult gathering; or a display in a school assembly program. The purpose of the demonstration will be to point out some local conservation problem, suggest a remedy that may be undertaken by anyone in the community, and to announce a conservation program that will be carried out during the balance of the year.

The 541 Local Scout Councils will be encouraged to make their camp properties outstanding examples of sound conservation practices and places where Scouts and adults may learn certain attitudes and techniques

for the intelligent use of natural resources.

The aims of the Scout conservation program are to focus the attention of the entire membership—boy and

adult—on local problems, to demonstrate methods and techniques for helping to solve those problems, and to make Scout camp properties "conservation laboratories" where boys and adults may learn methods which may be applied in their home communities. To back up the program, a carefully selected set of suggested activities is being sent to each professional Scouter for distribution among units in his Council.

Professional wildlife and soil technicians, foresters, sportsmen, and all other individuals with technical know-how are requested to help local Scout units or local Scout Council leaders set up their conservation programs. The success of the program depends, to a large extent, upon such local assistance. In many cases, Scouters will approach conservationists for ideas and suggestions. But other Scouters may not be aware of the conservation needs of their community, and in those cases conservationists may get the ball rolling by taking the initiative and making the contact with Scout unit leader or Scout Council executive.

## Things You May Not Know

The beaver has the swimming power more highly developed in his hind feet than has any other quadruped.

\* \* \*

The eyes of hares are never closed. They have no eyelids but are equipped with a thin membrane which covers the eyes when the animal is asleep or at rest.

\* \* \*

The armadillo gets its name from the Spanish word meaning "clad in armor."

\* \* \*

When the Barbary sheep, the only wild sheep in Africa, suspects he is in danger, he does not flee. Instead, he remains motionless, trusting his color to blend with the surroundings to conceal him.

## 'Possums

• Continued from Page 18

Nevertheless, it is doubtful that reduced trapping activity would account for the entire reduction in 'possum take, which would indicate a lower available population. With the high reproductive potential possessed by 'possums, this is not as serious a matter as it is with low producers like the mink, who is also saddled with a high price on his head.

In comparison with the wearing qualities of other furs, the opossum does not rate very high, but is widely used in jackets, coats and trimming, and ranks among the first six species in importance as a furbearer. It has a durability rating of 37, as compared to a rating of 100 for otter, which is considered the most durable of all furs. Beaver rates at 85, raccoon 80,

mink 75, striped skunk 50 to 75, muskrat 35 to 60, and rabbit 5.

When it comes to baked 'possum, some folks claim he's a gourmet's delight. Described as very palatable and delicious, the taste of his juicy meat is compared most often to being somewhat like pork, lamb or mutton.

Doubtless it was while gorged with savory 'possum meat and sweet potatoes—producing a tranquility of mind matched only by the 'possum himself—that someone was inspired to compose the old Southern Negro song:

*'Possum ara a cunnin' thing,  
He rambles in de dark,  
Nothin' 'tall disturb his mind  
But to heah my houn' dog bark.  
—The Missouri Conservationist.*

## Brush Shelters

• Continued from Page 29

with the wind-row type of brush shelter, the tree top shelters should be firmly anchored so that they could not float free to cause damage or difficulties at the dam.

These then are the things which the individual fishermen, camp operators and boat dock owners can do to help themselves to better fishing and greater profits. If everyone who likes to fish will cooperate in placing brush to provide the needed cover for fish, doing the work each time the fish are not biting, it won't take too long before fishing on Lake Travis and similar lakes will be very much improved. One thing more, since water levels do rise and fall, it will take constant effort on the part of every one concerned.



# BOOKS



## Booklet

**WILD ANIMALS OF FIELD AND FOREST**, by William T. (Bill) Cox. 112 pages. Illustrated with numerous black-and-white sketches and halftones. Published by *The Farmer*, 55 East Tenth Street, St. Paul 2, Minnesota; 1950. Price 25 cents with plastic binding, 50 cents with saddle stitched binding.

This booklet, a reprint of popular animal stories that appeared in *THE FARMER* between 1946 and 1949, makes entertaining and informative reading. The various stories are told simply enough for older children to read with interest and contain factual material that will appeal to most adults. Cox has had wide experience in forestry and wildlife management, and his personal experiences with the various mammals and problems discussed lend authority to his tales. Many of the common problems of wildlife management — changes in habitat, predator-prey relationships, overpopulation, crop damage, and others—are discussed briefly but, for a popular publication, quite thoroughly, and the conclusions reached are sound. Each of the major species or groups of species is covered under a separate chapter, and the book contains final chapters on tracking, animal migrations, and a plea against carelessness with fire.

The most significant feature about this booklet is the fact that it is published for farmers by a farming magazine. Booklets of this kind, interestingly written yet containing factual material on problems of wildlife management, forestry, soil conservation and related fields, should play an important part in the conservation-educational program. More books of this kind are needed badly.

**ADVANCED BAIT CASTING**, by Charles K. Fox. 204 xii pages. Illustrated with numerous black-and-white drawings by Fred Everett. Published by G. P. Putnam's Sons, 2 West 45th Street, New York City 19, New York. Price \$3.75.

There have been many books written for the beginning fisherman, but here

is one written specifically for the experienced angler, particularly for the man who is interested in the absorbing sport of taking fish on the short rod and plug. Although the dry-fly purist sometimes is prone to look down his nose at the plug-caster, Cox maintains that as much skill is required to hook and land a good fish on the casting rod as it is to take one on the flyrod. And if tackle is matched properly to the fighting ability of fish being taken, the fish has as much chance of escape as it has when the angler is armed with an eight-foot rod and a number 10 fly. Cox is an advocate of the lightest possible tackle consistent with efficiency. His own favorite gear consists of a six-and-a-half foot rod capable of throwing plugs little heavier than bass bugs.

In this book, the author covers many situations which frequently bother experienced fishermen and which often have been neglected or passed over lightly by other writers.

**SKEET AND TRAPSHOOTING**, by Dick Shaughnessy and Tap Goodenough. 180 pages. Illustrated with 38 halftones and line drawings. Published by A. S. Barnes and Company, 101 Fifth Avenue, New York 3, New York; 1950. Price \$3.00.

When one of the great shotgunners of all time teams with a first-class writer to prepare a book on skeet and trapshooting, the result is certain to be authoritative and well-written, and this one is both. Dick Shaughnessy, as nearly everyone who recognizes one end of a shotgun from another knows, is the boy who, in 1936, set the world of skeet back on its heels by winning the national championship at the age of 14 and who has been winning annual championship matches with considerable consistency ever since.

The book, in a brief but not sketchy manner, covers the entire subject of skeet and trapshooting from the history of these sports through to the conducting of shooting contests by clubs. There is a satisfying section on the care and selection of guns and equipment, a rather detailed chapter on the lay-out of trap and skeet fields, and tips for improving the shooter's marksmanship. The appendix, which occupies about a fifth of the pages, covers the rules of skeet and trapshooting and a directory of skeet-and-trapshooting clubs in the United States. The illustrations are many, and these are well-chosen to emphasize points brought out in the text.

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*An Editorial*

## Conservation and the Brannan Plan

**A**N EVALUATION of the Brannan Plan appears in the October issue of FORTUNE under the title, "The Duchy of Brannan" by Russell W. Davenport, and it is "must" reading for all interested in the management of renewable natural resources.

This article charges that the long-range objectives of the Production and Marketing Administration, which has been built to unprecedented power under Secretary Brannan, are to absorb the Soil Conservation Service and to concentrate under its control all farm programs yielding dollar benefits to farmers. This powerful bureau now controls acreage allotments, marketing quotas, soil conservation payments, price supports, and many other programs directly affecting the rural economy.

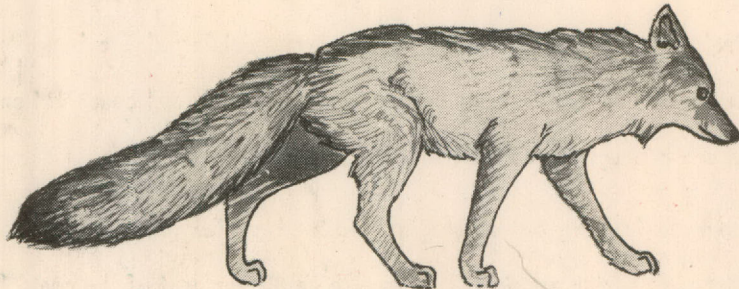
The net result has been to encourage farming on submarginal lands which, for the good of the country, should remain in grass and trees or under permanent water. Up to 80 per cent of the cost of draining and clearing such lands may be paid for by the Government of the United States creating additional acres on which to raise crops which the same Government must buy and waste in order to maintain prices. Aside from the widespread destruction of valuable wildlife range and the ruin of local recreational resources, this program has encouraged wheat and corn production on lands where permanent vegetation is the only thing holding the soil in place and in accelerating erosion elsewhere by encouraging the clearing and cultivation of steep slopes.

All this in the name of "conservation" in spite of the evidence that the program is furthering the destruction rather than the conservation of our basic land resource. Because payments for such destructive draining and clearing are lumped with those for sound land management measures, widespread abuses of the subsidy program, in many places, overshadow the good it was intended to do, and the entire conservation program has received an undeserved black eye. If gullies, dust bowls, floods, soil depletion, and destruction of wildlife habitat must be subsidized, let's call it something besides conservation.

# FUR in TEXAS



MUSK RAT



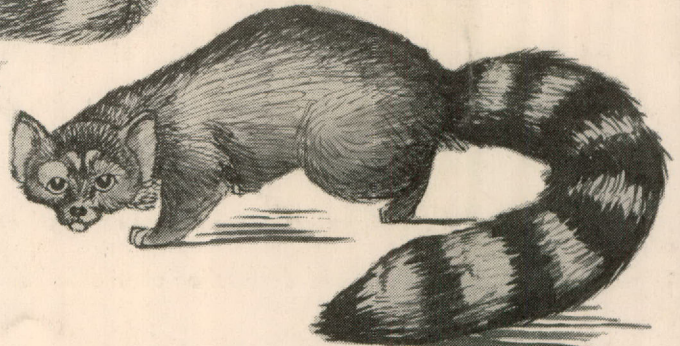
GREY FOX



STRIPED SKUNK



RACCOON



CACOMISTLE (RING-TAILED CAT)

S. WOOLDRIDGE