

Texas Game and Fish

AUGUST

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WASLDRIDGE



THIS GOLDFISH SWALLOWED A SEED. It's no joke. A seed, apparently dropped from a parakeet cage and gobbled by the fish, lodged in the fish's gills. A six-inch

plant grew from the fish's mouth before it was dislodged. Mrs. Willard Clayton, Marshall, owned the fish. (Marshall News-Messenger photo by Bob Burns)

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.

August, 1955

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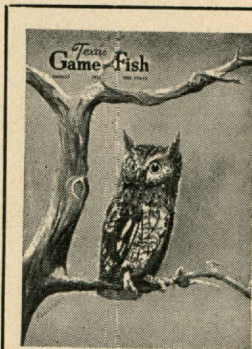
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The Cover

The screech owl, a small, red-brown and gray owl with ear-tufts, has scared the daylight out of many people with its wailing cry. This distinctive sound is a series of hollow whistles on the same pitch, separated at first and running together at the end. Eating all insects and mice and frogs, it is beneficial to the farmer. Ranges from Canada to Mexico and everywhere in Texas. Painting by Sidney A. Wooldridge.

Texas Holds Second Antlerless Deer Hunt

By BOB RAMSEY

Wildlife Biologist

Doe deer were legal targets for hunters in three Texas counties during the 1954 season.

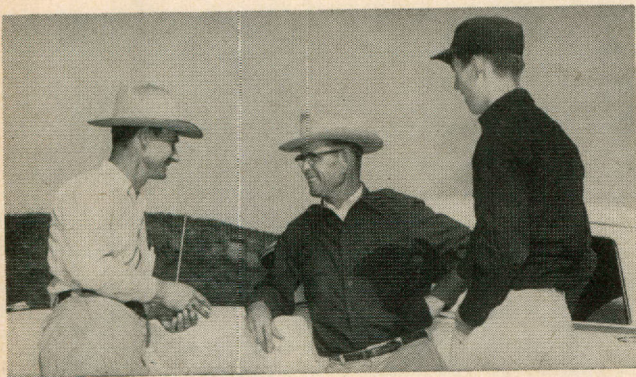
A TOTAL of 3,329 antlerless deer were killed during Texas' second legal "doe" season December 1-15, 1954. These were part of an estimated 9,000 surplus deer, which created an overpopulation problem in Mason, Llano, and Gillespie Counties.

Hunters were given special permits to kill these antlerless deer under regulatory authority delegated to the Game and Fish Commission by the State Legislature. Purpose of the hunt was to attempt to prevent a threatened major die-off on drouth-stricken ranges where deer populations had outstripped the food supply.

Of the 3,329 antlerless deer bagged in 1954, 2,723 (81.8 per cent) were adult does, 306 (9.19 per cent) were buck fawns without hardened antlers protruding through the skin, and 258 (7.75 per cent) were doe fawns. Forty-two (1.26 per cent) were adult bucks which had either shed their antlers already or had failed to develop hardened, visible antlers, due, in either instance, it is believed, to malnutrition resulting from prevailing drouth conditions.

Actually, following completion of deer counts November 10, an overpopulation of deer was found to exist in a comparatively small area of each of the three

● Continued on page 26



Antlerless deer hunts have given many youngsters a chance to kill their first deer. Bruce Lindsay, Sr., of Cameron, center, took his 14-year-old son Bruce, Jr., to Llano County for a try. They are shown discussing a day lease with landowner Elmo Stotts, left.



Photos by
Townsend Miller

After an estimate is made of the number of surplus deer on each ranch, landowners are issued one special permit for each deer. These permits in turn are issued by the landowner to hunters. If the hunter makes a kill, the antlerless deer is checked through a special check station and tagged. Here, Biologist Frank Rogers and Gene Walker, head of the Wildlife Restoration Division, check over groups of tags with numbers corresponding to permits issued to landowners.

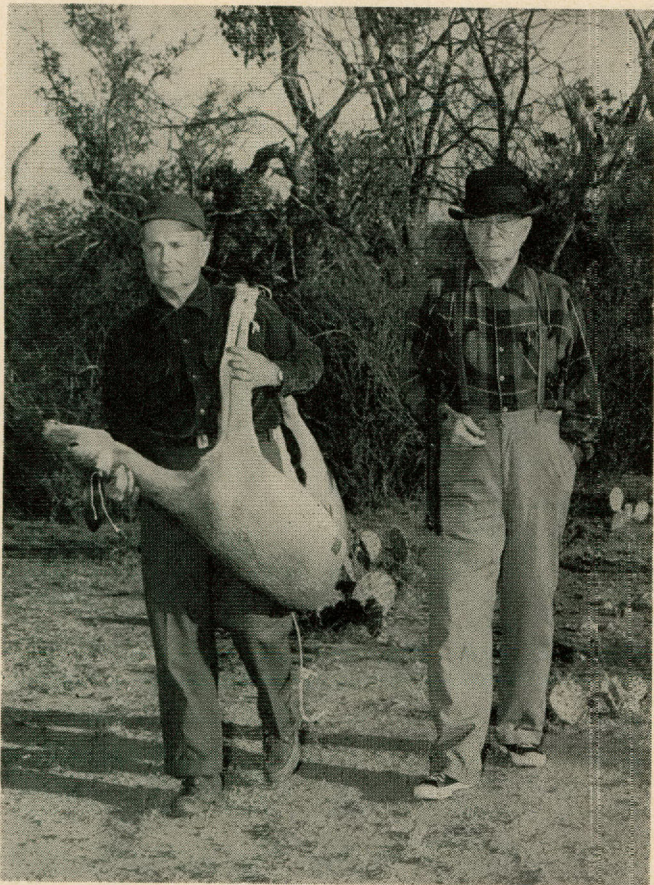
Here's How It Works

Texas "doe hunts" attract many types of hunters. Some are veterans. Others find in the special hunts a chance to hunt deer for the first time. Still others are attracted because leases are much less expensive than regular buck leases.

The two San Antonio hunters shown in this series of photos had their own reasons. One of them, Rufus Bell, possessed a collection of mounted game animals. But until it became legal to shoot antlerless deer he wasn't able to add a doe head to his display. The other, Arthur C. Worrell, had lived 82 years without hunting deer. He was seeking his first kill.



Worrell, left and Bell right, first check in at Cottonwood Ranch with the owner, D. F. Belknap, Merble Falls. Here they are issued special antlerless deer permits to go with their regular hunting licenses.



Less than half a day later, each had bagged a doe. Their next step was to check back with the landowner to report the kill for the landowner's records. Then they headed for the nearest official check station of the Game and Fish Commission.



At nearby Pack Saddle check station, their does were tagged with tags corresponding to the permits issued by the landowner. Commission representatives also record weight, sex, approximate age, and general condition of each deer. The antlerless deer then is ready for the trip home and the deep freezer.

Fishing for

CHANNEL CATFISH

in Texas

By GEORGE K. REID, JR.

Department of Wildlife Management
Texas A. and M. College

Recent issues of *Texas Game and Fish* have contained letters from readers inquiring into fishing for channel cats, and in one number of the magazine the editor pointed to the need for such information. Among the fourteen trainees in the Ninth Game Warden School held during the spring semester at Texas A. and M. College, there were several self-admitted experts in the art of catfish angling. There were others who owned-up to knowing some tricks but who disclaimed being experts. This article is the result of contributions by members of the class (and some of their catfishing friends as well); it is designed to help those unfortunate souls who have not fully enjoyed "catfishing." It must be emphasized that we are talking about one or another of the channel catfishes, not "bullheads." Bullheads are another type of catfish which have squared or rounded tails, frequently take over farm ponds and,

to the channel catfisherman, are disgusting and not fit to share the same water with channel cats.

There are three species of what might be called channel catfishes in Texas. We have *Ictalurus punctatus*, the southern channel catfish; *Ictalurus lupus*, the headwater channel catfish, and a near relative of the channel cats; *Ictalurus furcatus*, the blue catfish. The headwater catfish is not commonly found in most of our streams.

The southern channel catfish is probably the most widespread and abundant of all the channel cats in Texas. This fish is colored a light to dark gray and usually has many dark spots on the body. All of the species of channel catfishes have forked tails, which distinguish them from other catfishes. Among the channel cats, however, the best way to know which species you have is by counting the rays in the anal fin; the southern channel cat has 25-29 anal rays (and

a deeply forked tail); the headwater channel cat has 23-25 (the tail is less deeply forked); and the blue catfish has 30-36 anal rays.

Both the southern channel catfish and the blue catfish feed on a great variety of items. Insects, crayfishes, worms, frogs, and fishes are conspicuous elements in the diet of catfishes, and they also feed on dead and decaying animal matter. Channel cats have even been known to eat berries and seeds from plants. This omnivorous feeding habit makes them readily available to an angler using almost any bait.

Even though it would appear that there is no real problem in how to fish for catfish and what kind of bait to use, there are considerable differences of opinions regarding these aspects of the art.

It was quite generally and enthusi-

Game Warden W. V. Lowry (left) and friend with a catch of 26 channel catfish caught with stink bait at Lake Kickapoo. The fish weighed 119 pounds and were caught in two hours.



Here is Warden Weldon Fromm (second from left) and some catfishing buddies with a three-day catch of catfish from Sugar Lake, in old Mexico. The catch weighed 1,200 pounds, but here they are dressed and ready for the deep freeze and skillet.



astically agreed among the warden trainees that channel catfishing is a great sport, since the fish put up a good fight and are delicious to eat.

Charles Burnette, Weldon Fromm, and W. V. Lowry agreed that the best tackle to use consists of rod and reel, heavy test line and treble hooks. It goes without saying that the old cane pole catches fish too. It was also pointed out that shrimp, dried blood, liver, rabbit meat, chicken entrails, live minnows and an assortment of other items could be used for bait. Even though channel cats will take a variety of baits, the warden trainees generally endorsed the use of "stink bait."

Now it seems that the manufacture and contents of stink bait are two secrets well-kept by the ardent devotee of catfishing. It apparently can be made from a number of oderiferous materials. The basic idea is that channel cats feed largely by smell; consequently, a bait that smells the farthest catches the most fish. Lowry parted with the information that a "simple" stink bait can be made by "seining a bunch of minnows and spreading them out on a screen wire and letting them dry until all the moisture has evaporated. Then put the dried minnows in a can, chop them up, put a lid with holes in it on the can and allow the stuff to ferment. There is usually enough oil in the dried minnows to make the bait stick together properly." The bait must be sufficiently firm to mold into a ball which will stick together when mashed onto the hook.

An old fishing friend of Lowry, Charles Wyman of Quanah, Texas, has hit upon a formula for bait so successful in catching catfish that he has patented the concoction. He is now commercially engaged in the manufacture of "Quanah's Famous Catfish Bait." As proof of the irresistible nature of this stink bait, Wyman and Lowry fished for about an hour and a half in the Brazos River near Bryan, in April, and caught sixteen channel cats; the largest weighed twelve pounds and

Charles Wyman of Quanah, Texas, and some channel cats caught on the stink bait which he has patented.



average for the catch was seven pounds.

Although we have suggested that channel cats feed on a great variety of things, studies show that a given population will generally eat pretty much the same foods at a particular time. In other words, even though there may be crayfishes, insects, and other organisms present during a certain season, most of the fish may be stuffed with minnows while perhaps a few months later the diet may change to something else. It is, therefore, good practice to try a variety of baits.

Blood bait is certainly one of the most attractive dishes you can offer a catfish. This bait is easily made by simply allowing cow, pig, or chicken blood to coagulate in a shallow pan and then cutting the congealed mass into strips and threading the strips onto a treble hook. Care must be exercised since the blood is relatively soluble and does get off the hook easily. Perhaps mixing a bit of flour dough or the like with the blood would solve the dissolving problem.

Live animals such as minnows, worms, crayfishes, and frogs are relatively successful bait. Cut baits made of fish meat, pork rind, or almost any meat are also good. These cut baits usually catch more fish if allowed to age a bit before use.

In answer to the question, "Where do you fish?" our warden group summed it up this way: "Where to fish cannot be answered directly be-

cause you fish in different parts in different times of the year. Fish are in different localities in the water in different times of the year and different times of the day. You must fish in the area where the channel cats are." This last statement beautifully states the case.

Angling for the tricky catfish is just as much an art as is preparing bait. It is most important to have good equipment if you are planning to cast. Daylight fishing especially requires accuracy in casting near to where the fish may be secluding himself, and, since the bait may be cast or drifted considerable distance, a stout line and relatively stiff rod are valuable. Sinkers should be used; the matter of floats is subject to argument. It would seem that a weighted bait being carried along the bottom would appear more natural to the channel cat than a bait hanging from a float.

Now with some general ideas as to bait and gear let us get into the water. Fishing can be done from bridges and piers, but the best results are to be obtained from wading the river, walking the banks, or fishing from a boat. Regardless of which of these methods is used, the basic idea is to place the bait near everything that might be sheltering a catfish—logs, brush, holes, pilings and the like. Disturbing the water, making loud noises, and stomping around in the boat or on shore cut down the

● Continued on page 30

Use Any Kind of Bait — — Insects, Worms, Frogs, Berries — — They'll Eat Anything!

A brief digest of the sixty-six

NEW

Game and Fish

L A W S

as passed by the recent session of the Legislature

Summarized by ERMA BAKER

Division of Law Enforcement

Sixty-six new laws affecting wildlife were passed by the recent Texas Legislature, and they will be in effect in September.

Perhaps the most important were the statutes, sponsored by the areas affected, to give the Commission regulatory authority over game and fish in seventeen additional Texas counties. This raises the total of such counties to sixty-seven.

Most of the laws are local in nature. One state-wide provision permits Texas residents sixty-five or more years of age and persons under sixteen years of age to hunt and fish without a license. Such exempt per-

sons, however, will need an exemption license (for which no fee is charged) to hunt deer or turkey.

One state-wide law permits the Commission to harvest surplus wildlife on the game management areas.

The shooting preserve law has been amended to permit the hunting of pen-raised game birds on licensed "shooting resorts" under controlled conditions, and to provide for restocking of the resort area by its operator.

A new edition of the Digest of Game and Fish Laws, which includes these changes, is now available.

HUNTING LAWS

LICENSE

Exemptions: Texas residents 65 or more years of age and persons under 16 years of age are entitled to hunting privileges without obtaining a license and without payment of any fee, but according to Attorney General Letter Opinion No. MS-229, dated July 11, 1955, will need an exemption license to hunt deer. One reason for this is that the deer tag provisions are still in effect.

CHACHALACA

Frio and La Salle Counties: Season open all year, but daily bag limit is 5, weekly bag and possession limits are 10.

PHEASANT

Ellis County: Season open Dec. 1 through Jan. 16.

Frio, Kaufman (except in "Combine Community"), and La Salle Counties: Season open all year.

Hidalgo County: Season Open Oct. 1 through Jan. 31 on 320-acre-minimum tracts stocked with pheasant raised by licensed game breeder.

Travis County: Pen-raised pheasant may be released for hunting purposes. Open season for legally propagated pheasant Nov. 15 through Dec. 31 on Saturdays, Sundays and Wednesdays and legal holidays during season. Shooting hours first day 10 a.m. to sunset; other days sunrise to sunset. Controlled season open Sept. 1 through Nov. 1 on said days and shooting hours the same. Bag limit 4 pheasants per day. Means of taking, shotgun only. (Controlled season may exist only on private land on which 30% of total number of birds to be released has been released 5 days prior to opening of con-

trolled season, and remainder released at any time during controlled season.)

QUAIL

Andrews County: Season closed until 1958.

Cochran County: Season open Dec. 1 through 15.

Collin County: Season closed until Jan. 1, 1958.

TURKEY

Austin, Burleson, Harrison, Jim Hogg, Lee, Nolan, Panola, Sabine, San Augustine, Shelby and Washington Counties: Season closed until 1960.

Comal County: Turkey seasonal limit 2 gobblers.

Delta, Franklin and Hopkins Counties: Season closed.

DEER

Bowie and Marion Counties: Season open sunrise Nov. 16 to sunset Nov. 20. (Subject to change in Bowie County after Sept. 6.)

Burleson County: Season closed un-

til 1960 in Precinct 4.

Delta, Franklin and Hopkins Counties: Season open Nov. 21 to Nov. 25, both dates inclusive. Season bag limit, 1 buck.

Galveston, McLennan, Nolan, Orange and Washington Counties: Season closed until 1960. (Subject to change in McLennan County after Sept. 6.)

Hardin County: Dogs permitted in hunting deer.

Jasper, Newton and Prec. 4 of Tyler County: Season open Dec. 25 to Dec. 31, both dates inclusive.

Lamar County: Season closed until 1959 in Prec. 4.

Panola County: Season open Nov. 15 to Nov. 25, both dates inclusive, and dogs may be used.

Sabine and San Augustine Counties: Season same as under general law, Nov. 16 to Dec. 31, inclusive, but dogs may not be used in hunting deer.

Upshur and Wood Counties: Open Nov. 16 to Dec. 15, both dates inclusive. During closed season on deer, unlawful to hunt in deer territory with shotgun loaded with buckshot or slug, or with rifle larger than .22 caliber.

SQUIRREL

Angelina County: Season open Oct. 1 to Jan. 15, both dates inclusive.

Johnson County: No closed season and no bag limit. (Subject to change by Commission after Sept. 6.)

Lamar County: Bag limit 8 per day, possession limit 16 at one time.

Nacogdoches, Panola, Sabine and San Augustine Counties: Season open Oct. 1 to Dec. 31, both dates inclusive.

FISHING LAWS

LICENSE

Exemptions: Texas residents 65 or more years of age and persons under 16 years of age do not need a license to fish for noncommercial purposes.

MEANS OF FISHING, GENERAL

Penalty for "telephoning" or using any other electricity-producing apparatus designed for shocking fish is \$25 to \$200, and possession of such equipment in a boat or along a bank or shore of river, creek, lake or bay of this State is prima facie evidence of violation.

SPECIAL LAWS

Austin County: Minnows may not be taken from public waters to be transported beyond county for sale, nor sold outside of county. Transportation beyond county of more than 250 minnows at one time by any person, or of any minnows at any time by commercial minnow dealer prima facie evidence of violation. (Effective Sept. 6.)

Bosque, Coryell, Erath and Hamilton Counties: Restrictions as to sale and transportation of minnows do not apply to minnows taken from privately owned premises.

Calhoun, Refugio and Victoria Counties: Permitted fishing devices in Guadalupe River are hook and line, trotline, flounder gig and light, or cast net or minnow seine, not more than 20

feet in length for bait, only.

Cameron, Kenedy and Willacy Counties: Fish size limits for fish taken from Laguna Madre in sport or commercial fishing are: speckled trout not less than 12 inches in length; flounder not less than 12 inches in length; redfish not less than 14 inches in length.

Collin County: Seines and nets prohibited except minnow seine not longer than 20 feet for taking minnows for bait. Hooks on set line, throw line or trotline may not be less than three feet apart. Possession of illegal tackle within 200 yards of water prima facie evidence of violation. Minnows and fish from Lake Lavon may not be sold or offered for sale, nor taken or possessed for commercial purposes. (Other minnow restrictions still in effect.) (Tackle restrictions effective Sept. 6.)

Colorado River and its Lakes: Effective Sept. 6 it will be lawful to spear carp, buffalo, gasper gou, gar fish and Rio Grande perch with a spear gun and spear. A spear gun is any type of device used for propelling a spear underwater as a means of taking fish.

Comal County: Sale of perch and catfish prohibited. Throw line may not have more than 2 hooks. Not more than 10 throw lines may be set at one time. Trotline may not have more than 40 hooks. Only one trotline may be set at one time. Seines and nets prohibited except dip net or minnow seine not longer than 20 feet and of not less than ¼-inch mesh for minnows for bait, and set net of not less than 2-inch mesh for taking shad, sucker and buffalo. Size limits: bass not less than 11 inches; crappie not less than 8 inches; catfish not less than 12 inches. Minnows from public waters may not be sold or offered for sale. Not more than 100 minnows per day may be transported beyond county. Records of minnow sales required of private hatcheries to be available for game warden inspection.

Harrison and Marion Counties: In addition to regulations already applying to Caddo Lake, the season for taking crappie is closed until Sept. 6, 1958, during March, April and May. Effective Sept. 6, fish size limits are crappie not less than 9 inches; catfish not less than 12 inches. Bag limits are 15 crappie per day, 25 catfish per day.

Haskell County: Seines and nets prohibited except 20-ft. minnow seine for minnows for bait. Hooks on set line, throw line or trotline may not be less than 3 feet apart. Possession of prohibited tackle within 200 yards of public water prima facie evidence of violation.

Henderson County: Fish, except bass and crappie, may be sold after Sept. 6.

Jasper and Tyler Counties: In that portion of the Neches River forming the boundary between Tyler and Jasper Counties and in all lakes lying wholly within these counties formed by waters

from the Neches River, and in the Angelina River in Jasper County and all lakes lying wholly within Jasper County formed by waters from the Angelina River, seines and nets are prohibited except minnow seine not longer than 20 feet of not less than 1/6-inch square mesh for taking minnows for bait. (Seines and nets may still be used as permitted under contract for taking rough fish.)

Karnes County: Commercial dealer or any employee of commercial dealer may not take minnows. No other person may take minnows for sale. Minnows may not be transported beyond county for commercial purposes. Not more than 200 minnows may be transported beyond county per day or possessed in a vehicle.

Kimble and Menard Counties: Permitted devices are only ordinary pole and line, rod and reel, fly rod, throw line equipped with not more than one hook, and artificial lure when used with rod and reel, trotline equipped with not more than 30 hooks or drop line equipped with not more than a single hook to the line. Only 1 trotline per person or party of persons and 30 drop lines per person or group of persons permitted. Minnow seine not more than 20 feet long or fruit jar type minnow trap for minnows, carp, buffalo, suckers or gar fish permitted. Minnows from public waters may not be transported from county for sale. Not more than 200 minnows may be transported beyond county per day. Only resident licensed bait dealer may possess more than 200 minnows. Licensed bait dealer may not possess more than 1000 minnows from waters of Kimble and Menard counties. Fish sale restrictions still apply.

Milam County: Seines and nets prohibited except legal minnow seine for minnows for bait and standard gill net for taking rough fish.

Panola County: Penalty for fishing with electrical devices \$100 to \$500, was in effect from April 25 to May 6, when a general law repealing all general and special laws in conflict became effective, carrying lower penalty.

Rains and Van Zandt Counties: Seines and nets of not less than 1½ inches square mesh are permitted in Rains County and in Sabine River in Van Zandt County. Fish, except bass and crappie, may be sold after Sept. 6, effective date of this law.

Rockwall County: Seines, nets and fruit jars prohibited except legal minnow seine for minnows for bait. Hooks on set line, throw line or trotline may not be closer than 3 feet apart. Possession of prohibited devices within 200 yards of waters is prima facie evidence of violation.

Runnels County: In New Lake Winters, throw line may not have more than 2 hooks. Trotlines, seines and nets

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Some Truths
about the
Western
Diamondback

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in Texas

By
William G. McMillan

AMONG THE very few consistent truths about Texas rattlesnakes are (1) they can be easily identified by the rattles on the end of their tails and (2) their poison is dangerous to man and beast.

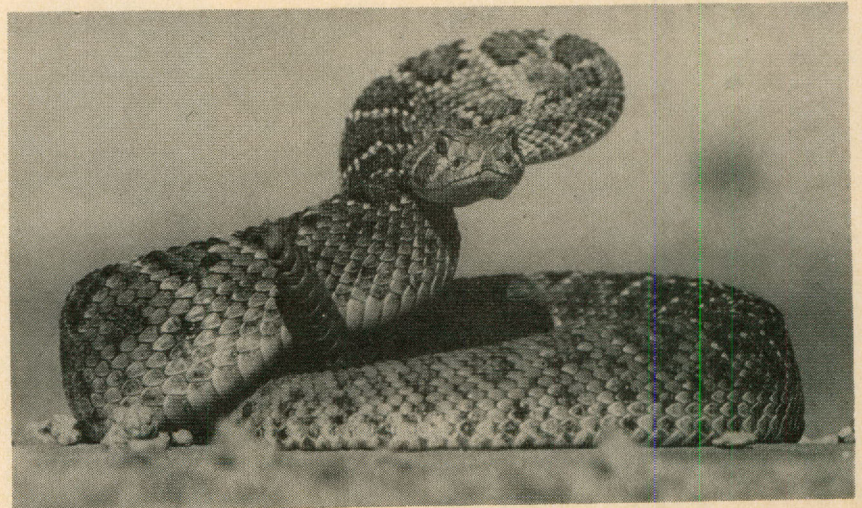
America has fast become camping and travel conscious. Being afraid of any of the many species of poisonous snakes found over a widely distributed area of the United States is not going to remove the hazard. The sensible approach to the problem is to know how to identify our reptiles, learn something of their habits and stay away from the likely lurking places of the creatures. In Texas alone there are twelve species of poisonous snakes which cover a greater portion of the State. Eight species of the rattlesnake family are found within our borders. The Texas Game and Fish Commission has published a very informative bulletin with illustrations and descriptions of Texas poisonous snakes. Every traveler and camper should carefully study the contents.

Contrary to popular belief the age of a rattlesnake cannot be determined by the number of rattles unless the rattles contain the original button which accompanies the twelve-inch long baby at birth. The snake normally sheds three times a year, each time adding another rattle. The rattles are easily broken off in brush and during hibernation. It is not uncommon to see a ten-year-old rattler with five or six rattles while a four-year-old specimen might have a string of twelve tapering

rattles. During the preparation period for shedding, which usually lasts two to three weeks, the dead epidermis is loosened from the body by an oily skin secretion. The snake simply crawls out of the old skin, turning it wrong side out in the process. The old epidermis sheds from over the lidless eyes, giving the reptile a milky look prior to the actual shedding. It is at this period when the snake is blind and is prone to strike, without a warning rattle, at a sound rather than by sight.

The removal of a rattlesnake's fangs is false security. They have as many as twelve sets of fangs under development at all times. As soon as one set has served its purpose another set is ready to move into place. It is not uncommon to see two sets of fangs in position at one time. Examination will disclose that one set is loose and ready to drop out at the slightest disturbance. Should a set of fangs be removed just prior to the normal shedding period it could be only a short time before the new set is ready for use. Consistent shedding and replacement of the fangs is nature's way of compensating for lost and broken fangs in struggling prey, such as rats, rabbits, civet cats, opossums and other strong-bodied small animals.

A rattlesnake is not affected by a self-inflicted bite except where the long sharp fangs actually penetrate the reptile's vital organs. It is common practice for the snake to bite violently at the area where bodily pain has been inflicted. The result-



ant death is most likely due to the attacker's efforts rather than the snake's own venom. Several species of the non-poisonous constrictor snakes, such as the king snakes, are unaffected in combat with venomous snakes. They can and do suffer, however, from the poisonous snake's fangs penetrating vital organs.

The body temperature of cold-blooded reptiles fluctuates within one or two degrees of the surrounding atmosphere. Direct sun rays in the high nineties or lower one hundreds will kill a rattlesnake within a fifteen-minute period. By the same token freezing weather will cause immediate death. You may be assured that no rattlesnake will be found traveling in the hot sunshine of its own accord. The heat of the day finds them coiled in the shade under rocks, logs, bushes or in holes awaiting the cool of the evening.

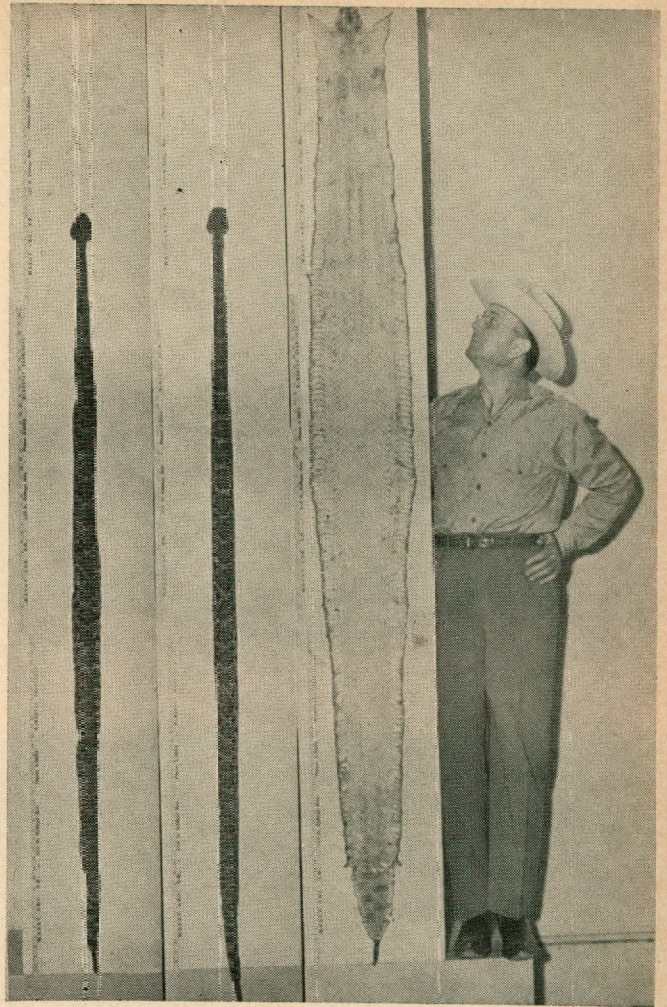
In the colder portions of Texas the rattlers start hibernating in October and remain semi-dormant until the latter part of March or early April. Since no food or water is consumed during the hibernating period, the snakes are not acquiring any perceptible growth. It is not unusual for nonpoisonous bull snakes and racers to hibernate in the dens with rattlesnakes. In the warmer sections of Texas little or no hibernation is required, with the result that the snakes are feeding the year round and grow to extremely large sizes.

Rattlesnakes are good swimmers. They can easily coil on the water and strike with the same effectiveness as on land. Any venomous snake can inflict serious results under water. The hypodermic needle is patterned after the venom conducting fangs of poisonous snakes. The opening in both instruments is on the side near the point, leaving the sharp point for maximum strength and penetration.

All snakes are prone to visit farm and ranch barns, lumber piles and rock fences in search of rats, mice and rabbits, their favorite food. Being nocturnal in their feeding habits, a safe precaution against accidents at night in snake-infested areas is the use of a flashlight or electric lights around the premises or campsite.

Don't Believe All You Hear - - or See!

Composite photograph showing three stages of measuring a big Texas diamondback rattlesnake. Figure 1 shows a six foot, eleven inch measurement, including rattles, immediately after death. Figure 2 shows same snake stretched three inches from its own dead weight. Figure 3 shows hide stretched to an amazing eight feet, eight and one-half inches. William G. McMillan is standing beside the snake skin.



A horsehair rope around the camper's bed is false assurance that reptiles will not crawl over the barrier. Creatures accustomed to crawling over rough ground and through thorns have no fear of the hairy texture of the rope.

In captivity small and medium-sized rattlesnakes will feed and drink regularly. They will take warm-blooded food dead or alive but prefer to kill their own prey by the injection of venom into the victim's body. The prey is not necessarily held fast in the snake's fangs until death ends its struggles. They have a remarkably faculty of following up the trail of a stricken rabbit or other strong animal of comparable size. The food is swallowed whole and slowly disintegrated by powerful juices in the digestive system. A good meal at two-month intervals will keep any reptile healthy and growing. The longest the writer has witnessed a big rattlesnake refuse food and water was eleven

months. Gradual emaciation of the body produced death. There was no apparent loss of weight in the creature up to an eight-months' period. Storage of fat and energy during the wild state had produced a reserve prevalent in all reptiles that cannot depend on food at regular intervals.

Contrary to many "eyewitness" accounts, parent snakes do not swallow their young in time of danger. Biologically it is impossible for any object to pass through a snake's mouth without eventually reaching the stomach area where the digestive juices immediately start disintegrating the food. The reproductive and digestive organs of snakes, as in all creatures, are entirely separate. The mother snake, in taking the characteristic defensive position, forms a pocket under her body where the young seek cover at the warning signal of the parent. The young seemingly slither down the mother's mouth. The big snake is killed, opened and found to have living young in her body. So—she swal-

● Continued on page 30



Open seasons on the white-winged dove in the past have lured thousands of hunters to the Rio Grande Valley, a major nesting area. They have killed up to 58 percent of the pre-season population in a single season. For the second consecutive year, the season will be closed in 1955. But declining habitat remains the major problem in whitewing rehabilitation.

The White-winged Dove

When the whitewing dove is mentioned in the Rio Grande Valley, long-time residents recall that in the early history of the valley the whitewing population was estimated to be about 20,000,000. Even as late as 1925 a population of 3,000,000 whitewings was recorded. A gradual reduction of available nesting grounds, severe hunting pressure at times, the destruction of whitewing eggs and young by such predators as the boat tailed grackle, and unfavorable weather have combined to reduce the current post nesting season population of the whitewing to about 213,000 in 1955. Even this is an increase over a low of 50,000 whitewings recorded in 1951.

The reduction of nesting cover by citrus and vegetable farmers was an important factor in the reduction of the population of the whitewing in South Texas. Big land developers arriving in the valley realized the potentialities for agriculture that existed there. Bulldozers and heavy equipment were brought in and thousands of acres of heavy brush areas that housed hundreds of thousands of whitewings were cleared for cultivation. The land was put to the plow and brush-

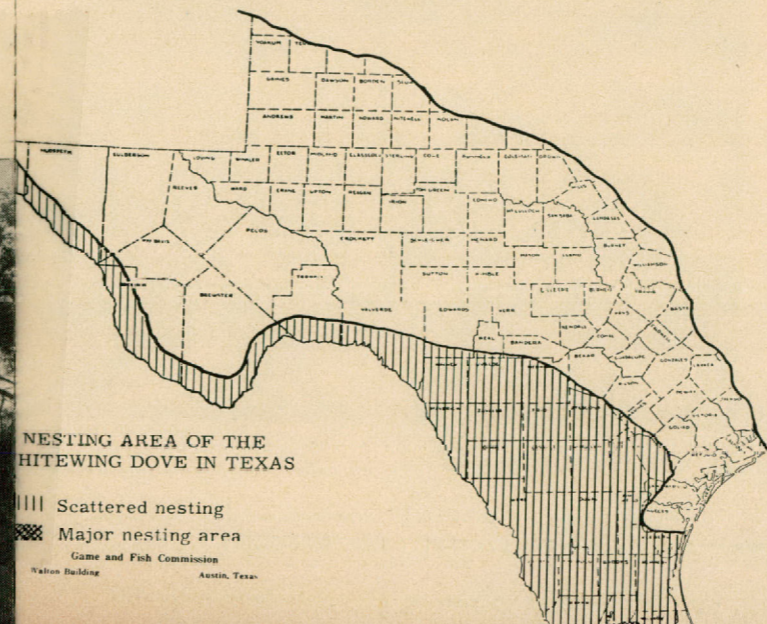
land nesting places were turned into crop-producing fields.

to the whitewing nesting problem in Texas is the remaining brush areas in the Rio Grande Valley area such as that shown to the right.

land nesting places were turned into crop-producing fields.

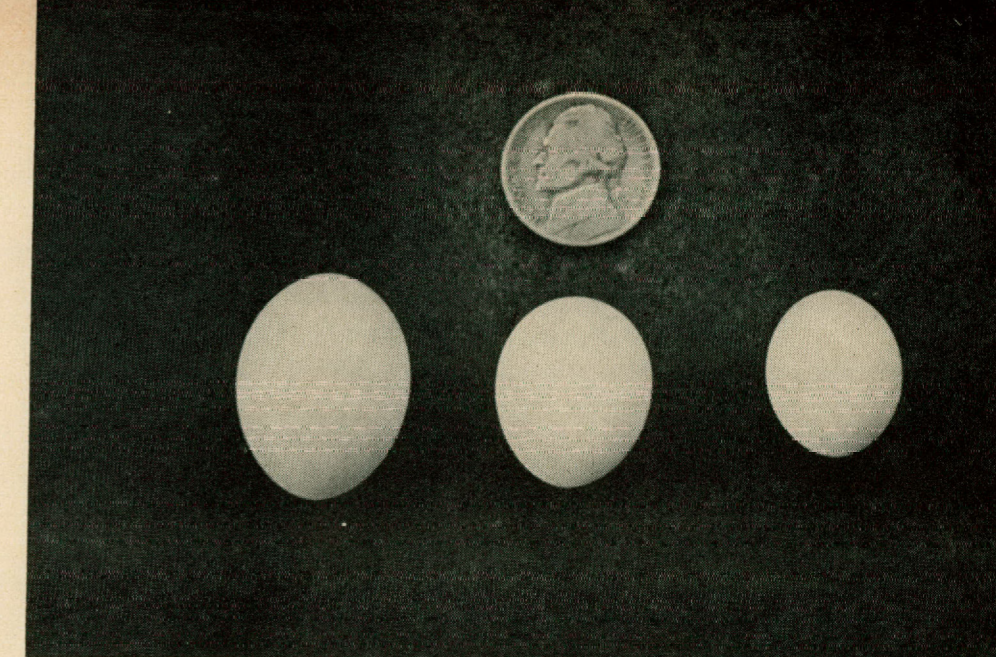
Before the clearing of these great areas of brushland, whitewings were seldom seen very far north of the Rio Grande. After these brushlands were cleared some large colonies of whitewings moved north to take up nesting in the Bccville, George West, Catarina and Uvalde sections of Texas where vast acreages of brushland offered isolation and protection. However, the majority of the whitewings remained in the Cameron-Hidalgo-Starr County area as shown on the nesting illustration included with this article.

It seems that the big problem created by the reduction of brush area in the valley was an increase of the concentration of the whitewings in the remaining brush-



By ED H. FERGUSON, JR.
Staff Writer

Size comparison of a nickel with (left to right) eggs of the Whitewing dove, mourning dove and Mexican ground dove.



An open hunting season brings out many Game Commission biologists and other personnel who attempt to collect as much data as possible on the whitewing kill. Bags are distributed by the Commission for the collection of one leg from each whitewing dove killed. These dove legs help to fill in information concerning (1) number of birds bagged and (2) percentage of birds bagged that were hatched in the current year.

Many whitewings nest in citrus groves such as that shown lower left. Texas Game and Fish Commission biologists feel that the real answer



Biologist Harris bands a whitewing. Birds are banded when 4 to 10 days old, depending on size and temperament.

Wildlife biologists J. T. Harris, left, and Bill Kiel check a whitewing nest in a citrus tree. A constant checking routine during nesting season yields a wealth of information on the life and nesting habits of the whitewing dove.



land areas. This gave predators freer access to the white-wing nests, thus decreasing the percentage of offspring. After the predators took their toll of eggs and young, the percentage of fledgling birds (birds surviving to leave the nest) was very small. As brush areas decreased, the percentage of loss of eggs and young continued to increase. Recent surveys indicate that the normal mortality of whitewing eggs is about 75%—i.e., about one out of every 4 eggs laid by the whitewink eventually produces a fledged bird that will follow through on the reproduction process if it is not bagged by a hunter.

The reduction of brush area in the valley and the planting of citrus eventually led to whitewing nesting in citrus trees. This change in the nesting habits of the whitewing may be a part of the answer to the question of survival for the species. As long as water is available to maintain the orchards, and as long as unfavorable weather such as hurricanes and freezes do not destroy these orchards the whitewing can find a satisfactory home here.

Biologists feel that the real answer to the whitewing nesting area problem lies in the retention of adequate areas of brushland in the South Texas area. Citrus orchards now provide a home for many whitewings and certainly there are advantages to citrus nesting in that adequate water in irrigation ditches is always adjacent to the nesting area. Also, there are fewer cases of predation by rats, opossums, and other animals that do not work in the open since the area between citrus trees is generally kept clear of brush and grasses.

There are, however, two definite disadvantages to whitewing nesting in the citrus orchards. In the first place, citrus orchards are more susceptible to drouth and heavy freezes. Brushland areas will remain as a good protective cover for nesting even after severe drouths and freezes.

In the second place, there is a great deal more human traffic in a citrus orchard than there would be in a brush area. In a brush area the whitewing would seldom be disturbed by human interference. The male and the female of the species take turns at sitting on the nest and never leave it untended unless driven off by some predator. In the citrus orchards the movement of tractors and people frequently disturb the nesting white-wing causing them to leave the nest untended. Once frightened from the nest the whitewing will not return for at least 20 minutes. This gives the boat-tailed grackel and other predators adequate time to make a meal of eggs or young doves. Further, there are indications that certain poison sprays being used in spraying citrus orchards might add further hazards to whitewing nesting in citrus orchards.

Severe hunting pressure in the Rio Grande Valley is also believed to have been an important factor in the reduction of the whitewing population in South Texas. Respect for the nesting season of the whitewing developed only recently as a result of a great deal of research by wildlife biologists, and the concern shown by valley residents for the reduced populations of whitewings.

Charles G. Jones, in the September 1954 issue of Texas Game and Fish pointed back to early valley

Growth of the White-Winged Dove the First 16 Days after Hatching

Photos by
Pierce Uzzell



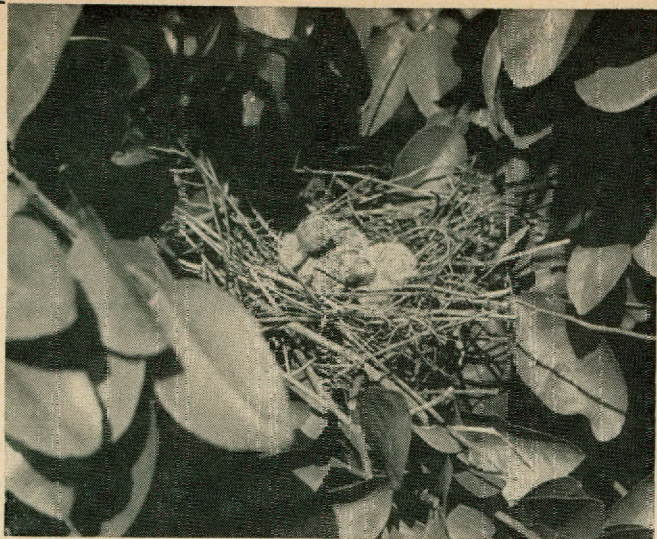
Eggs in Nest



5 and 6 Days Old



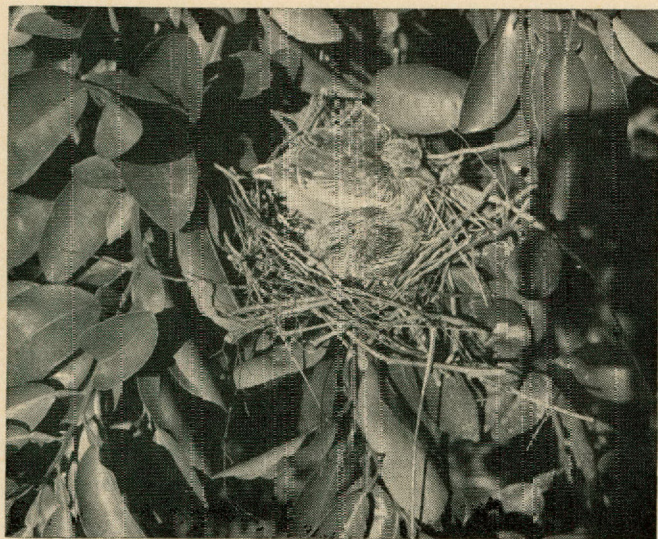
11 and 12 Days Old



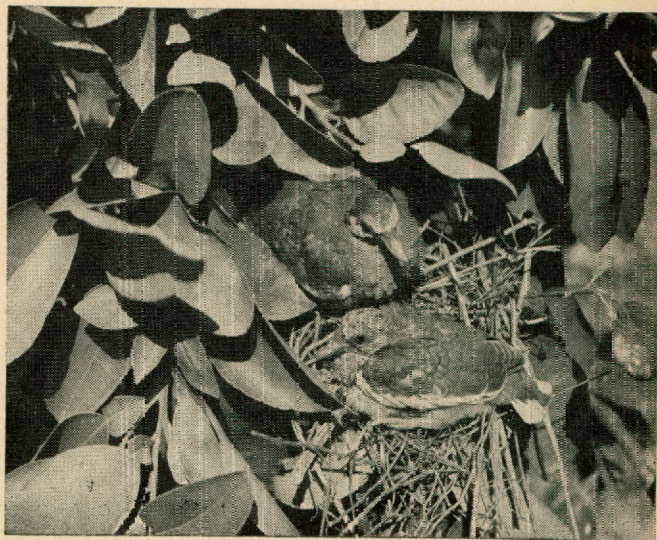
1 and 2 Days Old



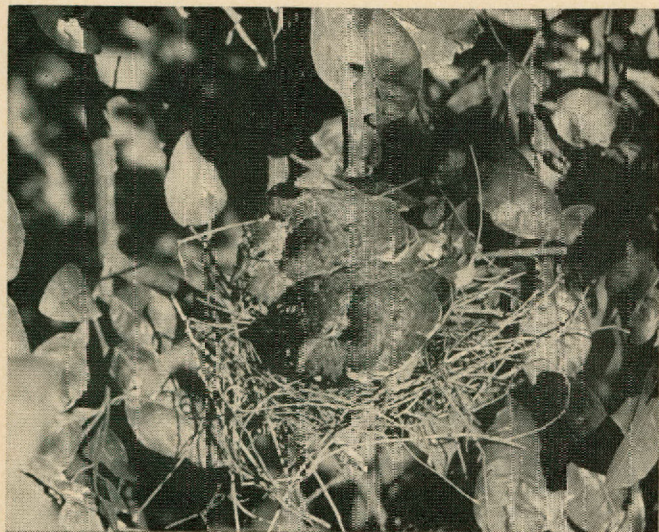
3 and 4 Days Old



7 and 8 Days Old



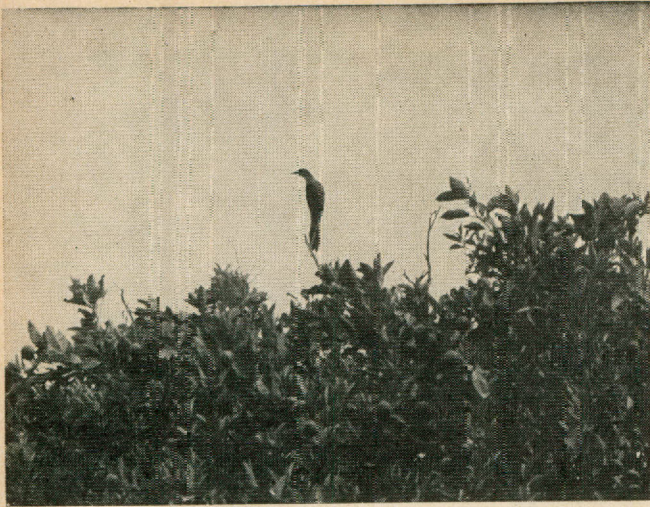
9 and 10 Days Old



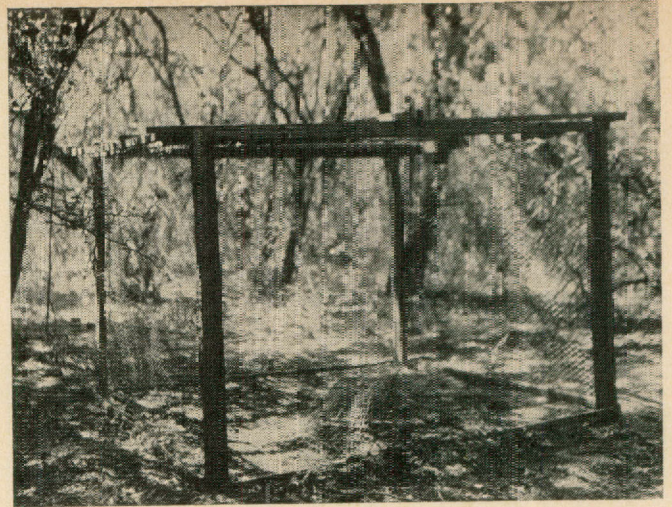
13 and 14 Days Old



15 and 16 Days Old



The boat-tailed grackle (*Cassidix mexicanus mexicanus*), left, is responsible for many predations on whitewing dove nests. Commission



biologists use grackle traps such as that shown above, and many other control measures in an attempt to prevent these predations.

history when "there were millions of whitewings and wanton destruction of the whitewing was rampant." Jones pointed out that at one time people in the valley decided that the whitewing season was not long enough. Through political maneuvering a law permitting the shooting of whitewings to begin the first of July and continue into November was passed. In recalling an experience he had upon entering some of the nesting areas three days after the season was opened in July, Jones reports:

"I went into the rookeries where thousands of whitewings had been nesting. The sight that greeted my eyes was appalling. There were thousands of dead

young in the nests, in the tangled brush, and others that had fallen from the nests, dead on the ground. Rotten eggs by the bushels were in the nests. Mother birds returning from feed or water were easy prey to the waiting hunter. The stench of the decomposing young forced me to leave the rookeries."

Many valley residents, according to Jones, finally realized that the wanton destruction of young whitewings caused by setting the whitewing season too early, and making it too long was entirely uncalled for. The length of the open season was gradually reduced.

Finally the federal government classified the white-

• Continued on page 28

WHITEWING POPULATION AND KILL, 1949-1955

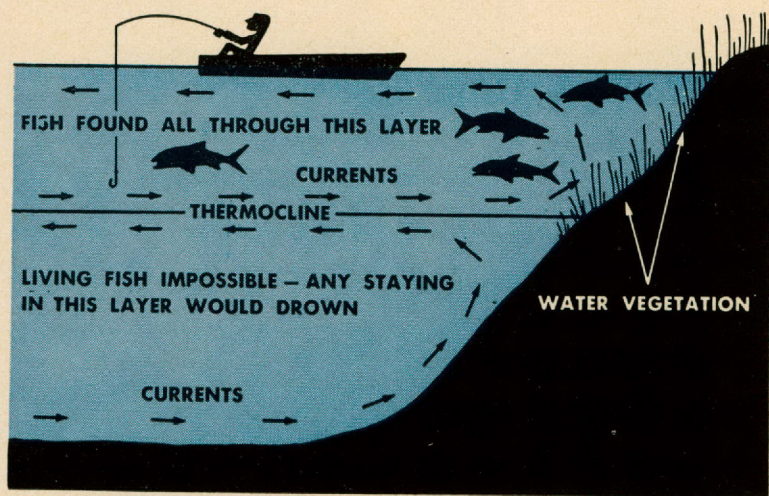
<i>Open Season</i>	<i>Bird Population</i>	<i>Number Hunters</i>	<i>No. Birds Banded</i>	<i>Birds Lost (Not Retrieved)</i>	<i>Total Birds Killed</i>	<i>% Estimated Pop. Kill</i>
1949 Sept. 15, 17, 19	800,000	28,940	218,365	33,936	252,301	31.5%
1950 Sept. 15, 17, 19	900,000	28,721	203,440	49,687	253,127	28.0%
1951 Sept. 14, 16, 18	197,150	19,804	30,100	13,901	49,001	24.8%
1952 Sept. 12, 14, 16	259,200	19,735	124,160	27,545	151,705	58.5%
1953 Sept. 11, 13, 15	159,900	14,800	28,514	9,298	37,812	29.0%
1954	50,000	Closed season				
1955	213,000	Closed season				

The Thermocline

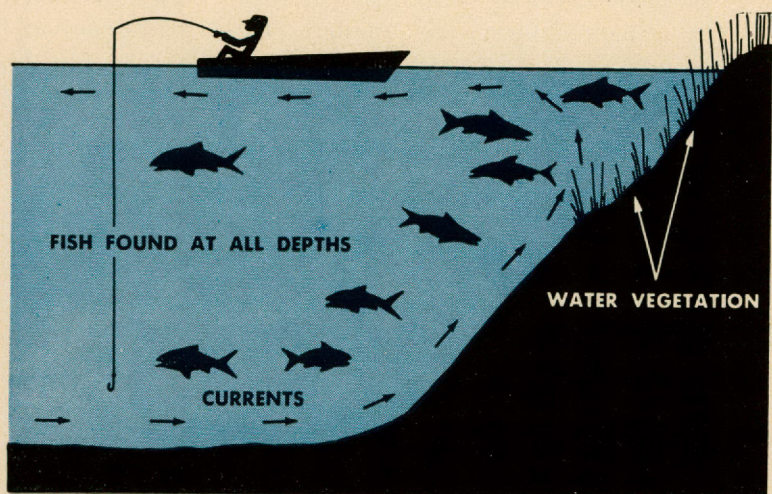
During the summer months, the average lake is divided into two parts. One is without oxygen—
or fish. The other has both. You'll be wasting your time fishing unless you understand why this is so.

By JASON LUCAS

Reprinted courtesy Sports Afield Magazine



Summer Fishing



Cool Weather Fishing

Everybody knows that man will drown in water unless he has some supply of oxygen. But do you know that fish, too, can drown? All summer in lakes that are anywhere near average in size and type, there is a thin dividing line, sometimes only a few feet down, to stay below which means certain death to any fish—death that comes more quickly than if he were lying on the dry floor of your boat. Below this invisible line, no creature can live but some worms of the lowest type.

This you can prove for yourself, by lowering some fish in a net or on your stringer. At 29 feet, say, they will live indefinitely and be perfectly healthy. Lower them to 30 feet, leave them a few minutes, and they *must* come up dead.

No, no poison has formed down there; there is nothing that isn't found at the higher level. The same thing has happened to them that would happen to you if your head were held under water an equal time. They have drowned! If you fish with your lure or bait below that invisible line, you might as well be trying to catch fish on the hot sands of the Sahara Desert. You can't possibly catch fish where there can't possibly be any alive.

And all because of a peculiar phenomenon called the thermocline.

This matter being of such importance to fishermen, it is strange how little it has been called to their attention. Mention of it is usually found only in scientific papers with such discouraging titles as *Lacustrine Thermodynamics* or *Limnobiology*; but I think I can here explain it pretty simply:

A fish, like a man, must constantly breathe oxygen or die, and the fact that one absorbs it through gills, the other through lungs, is a minor detail. Indeed, some scientists hold that our breathing system is a modification of theirs, and as evidence point out that a human embryo still has gill clefts. The circulatory systems of man and fish are basically the same.

In a lake, all fall, winter and spring, currents mix the water from top to bottom, so that all the water contains about an equal amount of free oxygen. Therefore, a fish

can live at any depth; he is likely to stay at the one where temperature suits him best. I know lakes where all winter it is customary to fish for bass 150 feet down, and probably they go much deeper.

But in early summer something that doesn't sound at all logical happens to a lake: As the sun heats the surface water, it expands and becomes a trifle lighter than that below. Presently this difference in density between top and bottom water becomes so great that they no longer mix. Each has its own currents that slide and roll across those of the other. They keep as distinct as if there were a huge sheet of cellophane between, covering the whole lake.

That imaginary sheet of cellophane is the thermocline.

In thermodynamics, the warm upper layer is called an epilimnion, the lower cold one, a hypolimnion. However, here we can dispense with such two-bit words, and call them just the upper and lower layers.

Water in a lake gets its oxygen from two sources. Some is given off by green vegetation; on a sunny, still day you can see the little bubbles rising from it. Some is whipped in from the air by waves. All summer, the upper layer receives oxygen from both sources.

In the lower layer, there are few or no green plants; enough sunlight does not penetrate there to permit them to grow, so it gets no oxygen from that source. And the thermocline prevents the two layers from mixing, keeping oxygen in the upper layer from getting down there.

This means that there is no new oxygen added to the lower layer until equalizing temperatures in fall break the thermocline, again permitting top-to-bottom currents. Oxygen in the lower layer is being steadily depleted by living creatures and by decomposition of organic material, until, soon, there is practically none left. And that is why a fish remaining there would die sooner than he would on the bottom of your boat—in your boat, he would be receiving some oxygen from the air so long as his gills remained wet. That, too, is why scientists are mystified by the presence of those lowly worms down

there. No fish are killed by this lack of oxygen because they flee that zone of death.

The usual depth of a thermocline is about 30 to 45 feet. But strong winds blowing steadily in one direction can pile the water of the upper layer to one side of the lake, forcing the thermocline deeper. Then, since the invisible film does not break, and the volume of water below it remains the same, the thermocline must rise on the other side of the lake, sometimes fairly close to the surface.

As I remarked, it is surprising how little this matter has been called to the attention of fishermen, for it certainly is of high interest to them. Why fish where there can be no fish?

Quite a number of years ago, I went into it thoroughly in these pages. Then I got letters from men who said they were scientists in leading universities, insisting that I erred and that the two layers could not possibly remain so sharply distinct. They held that a thermocline was really a rather thick layer of gradually changing temperatures.

In the matter, I had accepted the findings of men whom I regarded as thoroughly reliable leaders in their field, such as Samuel Eddy, Professor of Zoology, University of Minnesota.

Time—and the invention of the Aqualung—has proved that I was right. Skin divers of unquestioned veracity have written of hovering in the upper layer and poking a finger down into the lower. The thermocline, they said, was so thin and distinct that it felt like being in a warm room and putting one's finger into a glass of cold water. This firsthand—or should we call it first-finger—evidence should settle the matter for keeps.

How can you determine the depth of the thermocline in the lake where you fish? My own method, which has no doubt been used by others, is simplicity itself. I use a "maximum and minimum registering thermometer," which costs eight or ten dollars; mine was not meant for immersion, but a spraying with clear lacquer fixed that. Lowered to the depth you're testing, it will (until

reset with a magnet) show the lowest and highest temperatures encountered. Few fishermen may want to bother with such scientific procedures, but we can make use of our knowledge of the existence of a thermocline without them.

The water of the lower layer may all be practically the same temperature. This is not the case with the upper layer, the top of which will usually be kept warmest by sun and summer atmosphere, especially in calm weather.

Now, all our fresh-water fish, excepting some rough fish, show a distinct aversion to warmer water, and will if possible leave it to seek cooler. So where should we logically look for them when a thermocline is present in a lake?

Obviously, in the deepest, coolest water to which they can go without entering that zone of sure death; in other words, immediately above the thermocline.

The general rule, with rare exceptions, is that our fresh-water game fish do not like to hover in open midwater; they prefer to be close to the bottom, or among vegetation growing from it.

This means that all summer, and until pretty well into fall, we can give fairly reliable rules regarding where to look for fish in a lake of about average type. Except for somewhat rare stragglers in midwater, they won't be in water more than 45 feet deep, and often depths of only 30 feet or so will be their limit.

If there has been a strong, steady offshore wind, the depth at which they can live may be much less than 30 feet, and it may be that the upper layer will sometimes become so thin that they do not like to stay in it during the day, and will go elsewhere. Perhaps evidence of this is the fact that I have many times failed to catch a single fish at the side of a lake from which a strong wind had been blowing for some time, but could make fine catches at the other side.

For some reason that I do not understand, I have found this particularly true in fishing for pike, muskellunge and pickerel. Some of my finest catches of these, and some of my largest specimens, have been

taken in spots where handling both my boat and the fish in waves and wind presented a pretty wild problem.

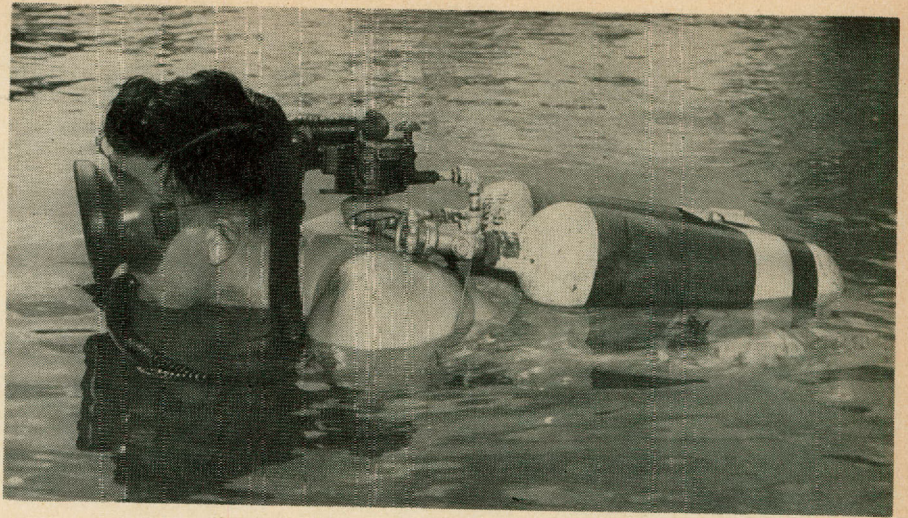
Sometimes in midsummer I have found good fishing, for bass especially, during the last half hour or so before dark. So far as I can figure out, this has nothing to do with the thermocline; it is merely that the surface water is cooling enough to encourage the fish to enter it for the abundant food.

All night, slow currents will have been mixing the water of the upper layer, so that by daylight it should be pretty well equalized in temperature. This, one might reason, should bring the fish up into the shallows for a much longer period than in the evening, and should afford very good fishing then.

However, I believe I can add a reasonably reliable rule in the matter: Where game fish are abundant, with much competition for food, they are inclined to enter the shallows regularly, often quite early, in the evening. Each wants first whack at the warm-water creatures there. But on a hard-fished lake, which has lots of food for the remaining game fish, they are not likely to start feeding strongly until about daylight, when they seem to want to fill up before settling down for the day in deep water.

In practice, this seems to hold true for me: I rarely find good evening fishing on a really hard-fished lake, but I generally do on one that's fished less, where there are many hungry fish. But I feel almost certain of finding good early morning fishing, especially for bass, on a hard-fished lake.

Somebody may ask why, if all this is so, lake trout are caught all summer at depths of up to several hundred feet. In very large lakes, such as Superior, action of wind and waves prevents formation of a thermocline, though in calmer weather thermoclines may form in more sheltered bays of such a lake. The exact size lake in which they can form depends on temperatures and winds of a given summer, but they will be found in probably close to 90 per cent of the lakes usually fished. I might add that a thermocline cannot



Staff photo by Clyde Graham

Diving Biologists to Aid Anglers

The use of skin diving techniques to study fish for the general purpose of aiding anglers is under consideration by the Texas Game and Fish Commission.

Marion Toole, Chief Aquatic Biologist, said formal request has been made of the Federal Government to use Dingell-Johnson funds, derived from a special tax on fishing gear, to finance the project.

The program, if authorized, will be tried out in Lake Travis, of the Highland Lakes chain, because it has unusually clear water. Other lakes would eventually be used.

Primary objectives would be to locate black bass concentrations; determine what lures will entice them and pass such information on to anglers; study habitat conditions that cause bass to gather in certain areas in preference to others; and spot schools of rough fish and inform the bonded commercial fishermen under contract where to set nets to increase the take of rough fish.

Black bass have been found to be

ordinarily form in less than 25 feet.

However, the smaller lake-trout lakes do have thermoclines and trout are caught far below them. This is because such lakes are of a peculiar, uncommon type: extremely deep and barren.

This great depth means a far greater volume of water below the thermocline than is found in most other lakes of equal size. The lower

quite wary, and it's well known they are too cagey to get caught in proportion to other kinds of fish. While carp, buffalo, pan fish, catfish and other species show no fear of skin divers, black bass shy away. If the diver descends and sits quietly on the bottom, however, the blacks will soon emerge.

Scientists do not consider any new knowledge unfair tactics. We have overpopulations of fish in most areas and the problem is how to catch them.

Since the announcement of plans to use skin diving as a means of broadening underwater observations of fish life, there has been a rush of applicants—all wanting to help with the diving.

An Air Force jet pilot volunteered to help out since he relaxes from supersonic routine with subterranean equipment. A University of Texas tackle said he would like to help out because he has been diving in fresh water to a maximum of 100 feet.—Jay Vessels.

layer is suffused with oxygen when the thermocline forms. Because of the extreme barrenness, there is a comparative scarcity of creatures down there, so the oxygen is reduced very little. There is enough oxygen to last the lake trout—and the small fish on which they feed—through the summer.

In conclusion, I'll admit that the

• Continued on page 25



Fundamentals of Producing Fish in fresh water

By DR. R. W. ESCHMEYER

Research — the Key to Future Fishing

Ninth of a series by the former Executive Secretary of the Sport Fishing Institute

The immense progress made in medicine, industry, agriculture, and other fields is attributable directly to scientific research programs. In the same way, fishery research, though still in its infancy, has already brought about some striking advances in fish conservation.

Most sportsmen now realize that the future of our fishing depends largely on fact-finding. For those who don't recognize this fact, an editorial in a recent issue of *Wyoming Wildlife* gives food for thought:

We live in an age of wonder drugs, antibiotics and synthetic fabrics. We move along at high speeds with automatic transmission, super fuels and jet engines. We watch television and cinemascope and listen to trans-oceanic broadcasts. We anxiously await fulfillment of promises of nuclear fission aircraft engines and of cures for TB and cancer.

One leading manufacturer boasts over the air waves that his most important product is progress through scientific research. We all appreciate the benefits we derive from continuing research in industry. Likewise, we're ready to accept an AMA finding regarding polio or a report from an engineering institute on some new discovery.

We fish with nylon leaders, with fiberglass rods, with reels made of

new alloys. Scientific research has given us new powder for our cartridges and new combinations of metals for our bullets. New metals insure rifle barrels with lifelong accuracy. We live in a wonderful age of scientific advancement and we take full advantage of it in the fields of medicine and industry.

Isn't it odd then, that the modern-day sportsman sometimes expects game management to ride in a buggy and yet keep up with present heavy demands on fish and game? Propagation of game animals by strict law enforcement alone or propagation of fish by planting alone are as dated as the mustard plaster and the kerosene lamp. Yet, some people insist that these two practices are sufficient. They regard scientific research in wildlife matters as a stupid innovation.

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

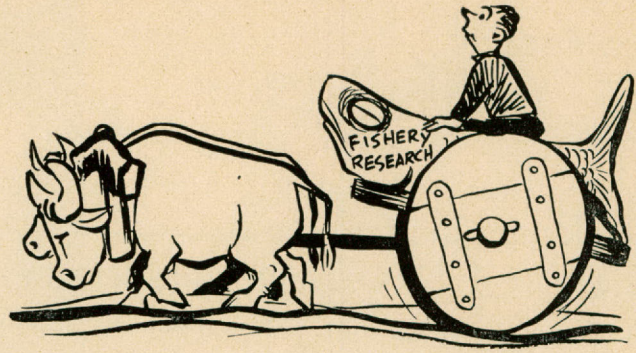
Rather than use this brief space to record some past accomplishments in fishery research, we're limiting this section to a discussion of the present picture and the future needs.

Some states have had a fishery research program for quite a few years.

But, others had no fact-finding even three or four years ago. The reason was simple. It was felt that the available money should be used for such popular panaceas as indiscriminate stocking and rigid law enforcement. There were no funds for research because its importance was not recognized. Sometimes the bottleneck was the administrator, often it was the state legislature, in some instances it was the sportsmen themselves.

Then, a few years ago, came the Dingell-Johnson Act, providing for federal assistance to the state fishery programs. These funds could not be used for routine stocking or enforcement. In passing the D-J Act, the legislators wisely excluded routine practices as proper uses of the added funds. This law gave fishery research a tremendous impetus. Many states decided to use some of the federal-aid money on fact-finding. During the first three years, the states obligated \$4,300,000 of D-J money for research projects. This called for their employing professionally trained fishermen to conduct the programs. Though some of the programs are still very rudimentary, all state fishery set-ups now have some fact-finding activity.

In many instances, those states which were starting research programs took their cue from states



which had long been engaged in research activity. It was pretty much a case of following the leaders. Money was available now, but in some instances the ability to plan a comprehensive program was lacking. Nevertheless, "following the leaders" led to immediate progress in some of these states.

What about the leaders themselves? Are they continuing to set the pace? Are they coming up regularly with new ideas and new methods? If the tendency is to follow the leaders, then there must be some progressive leaders to follow. If new ideas and new management procedures do not develop, we can expect to have a period of "stagnation" when the states which recently initiated fact-finding programs have caught up with those states which have long been active in research.

It seems that some former leaders are not making rapid progress. Some states which led the research parade seem to be marking time. New ideas are scarce. Procedures developed long ago—such as creel census and general lake and stream survey—seem to still be in the limelight, much as they were ten or fifteen years ago.

If we have entered a period of stagnation, at the very time when funds are available and when more emphasis is being placed on research, this will have a harmful effect on the entire fish conservation program.

Assuming that we have entered a period when new ideas are scarce, why has this development taken place? We don't know the answer, but much greater progress, the kind

we need to keep up with the parade, could be made if we had a better climate for research personnel—better salaries, freedom from routine jobs and political pressure, and reasonable job security. The low salaries paid to fishery investigators tend to stifle initiative.

The men in the fishery biology field are usually so busy with routine work, with trouble shooting, and with administrative matters, that they have little time to devote to basic research, and little freedom for creative thinking about the problems.

The solution seems to be to have some well-paid and well-qualified biologists devote full time to the investigative work, with a minimum of routine or trouble shooting; or, to turn over a part of the research money to the campus, in those states where a well-qualified fishery professor is available to guide the studies.

Regarding research, in a recent report to the American Fisheries Society, the committee on hydrobiology and fish culture made this ob-

servation:

Although most state departments of conservation support fisheries research to a limited degree, few maintain a fishery research division of trained personnel free to function without excessive curtailment by the demands of "trouble shooting," political expediency and excessive administrative restriction. One has the feeling that in many state departments fisheries technicians are tolerated because their presence suggests a certain mark of progressiveness; but little use is made of their research contributions in regulation and management procedures.

Actually, research has a big future. Any period of stagnation which we may have entered will probably be of short duration. Some former leaders are marking time, but new leaders are taking their places. About seventy-five trained fishery biologists have been entering the field each year, during the first three years of the D-J program, because of the impetus given to research by federal aid. In due time, they can be expected to lead us to a new period of rapid progress. Too, the growing recognition of the importance of research will help bring about more and better fact-finding and new developments in fish conservation.

Though fishery research has made considerable progress, we still lack adequate answers to many questions if we are to use our fish management tools skillfully and effectively. What are some of the questions which need answering? Here are a few that come to mind at the moment:

Stocking: Is the emphasis on

• Continued on page 24



Fish Reports

Field Data

Texas Tracks

By JAY VESSELS

WHOOPEE WHOOPLA

Down in Rockport they tell about the amateur ornithologist who early one morning alerted the entire neighborhood to hush-up en masse because "a Whooping Crane was standing on his neighbor's lawn." This was during the spring migration and everybody was Whooper happy. This particular morning a ground mist reduced visibility and the vigilant chap furthermore hadn't been told about the giant plastic bird model the neighbor had placed on location overnight.

BAIT BONANZA

The Denison *Herald* carried a full-page feature about Mr. and Mrs. John Spangler and their bait business. Besides raising a full quota of farm crops plus chickens, bees, and pheasants, the Spanglers have a thriving angle worm business. They got the idea on a fishing trip to Lake Texoma some years ago. Bait was so scarce that they sought a likely place to dig for worms. They got enough for their own use plus \$63 worth sold to other anglers.

CHRISTMAS DIVIDEND

Tommie Wilson of Fort Stockton has found another reason why Santa Claus should be here to stay. Somebody gave him a big game records book last Christmas and before long Wilson, on a casual check, found that he had a near-record mule deer which he bagged in Arizona two years ago. Measurements of the fourteen-point buck allow for a possible $206\frac{1}{2}$ points, whereas the record is $200\frac{3}{8}$ points. Game Warden Ted Wheelis said he believed the official scoring, to be made by the Boone and Crockett Club of New York, will reward Wilson with the championship.

HUNTING FOR FREE

That instinctive Texas willingness to take a chance is expected to work overtime again this fall. Because the Game and Fish Commission, by new legislative authority, expects to expand the free public deer hunt to, as yet, a limited extent. The drawing system, ordinarily exclusive with the fall antelope hunts, was used last year for the first free public hunt on the Kerr Wildlife Management Area near Kerrville. More than five thousand responded, although only seventy special permits could be issued. This fall, the Gus Engeling area near Palestine will be the scene of a similar harvest to reduce deer overpopulation in keeping with modern game management techniques. Kerr will be reopened, but the Commission asks the gunners to hold their correspondence fire until formal announcement is made, probably in early October.

HAIL HAVOC

Game Warden Tom Waddell of Eagle Lake reports a hailstorm killed practically all small wildlife in an area four miles wide and ten miles long, just south of his station. He said the violent ice spell annihilated doves, prairie chickens, jackrabbits, blackbirds, rails and fulvous tree ducks. Trees were stripped bare and crops in the devastated area beaten into the ground.

EVERYBODY HELPS

Game and Fish Commission aquatic biologists report the general public is cooperating wholeheartedly with the creel census routine which is continuing somewhere in Texas virtually all the time. The technicians check fishermen's strings for numbers, sizes, condition and other data vital to the studies which help keep 'em biting.

PANHANDLE PROGRESS

Outdoor Editor Paul Timmons of the Amarillo *News-Globe* wrote excitedly about Game and Fish Commission plans for a scientific study of Buffalo Lake to restore that once popular fishing spot. Paul said: "It is gratifying to hear that somebody is trying to do something for Buffalo Lake, and it is good to have some of our Dingell-Johnson money come home. The Dingell-Johnson funds come from the federal excise tax on sports fishing tackle. It is our money and we will benefit from it."

MEANDERING MULLET

Aquatic Biologist Ed Bonn, who is stationed on Lake Texoma, reports the catching of a striped mullet in the Red River below the Texoma dam, a good thousand miles from its salt water homeland. Bonn said mullet, primarily a salt water species, are common in such Texas rivers as the Colorado, Trinity and Sabine, which empty directly into the Gulf of Mexico. But this rare creature had to come up the Mississippi river or the Atchafalya on into the Red River, a total river distance of around one thousand miles.

TRAGIC CONCLUSION

Fate ended a hassle between a North Carolina man who had "adopted" a fawn deer and the law, according to AP. Game wardens appealed to the courts to compel the man to return the animal to the wilds, contending it ultimately would become a nuisance in captivity. But the "owner," with the aid of well-meaning but misled neighbors, raised a jackpot to fight the case. The showdown was averted when the poor fawn, frightened at a power mower, broke its neck against a fence.

Press Views Game Notes

MINK ARE SPARED

An eight-man crew excavating for a new bridge near Eagle Lake got an unexpected breather and a lesson in maternal determination when their dragline bared a den of mink. The contractor, R. H. Reese, Jr., halted operations while the mother mink carried her three young, one at a time, to safety. Forgetting her own instinctive wariness, the little furbearer on one trip scurried through the legs of one of the workers to take a short cut. Warden Tom Waddell, in reporting the incident, said all mink were saved and the bridge work went ahead without blight in the eyes of even the most superstitious crewman.

SATISFIED YANKEE

From far-off Detroit, Mich., a little girl scrawled a note to the Game and Fish Commission's education staff: "I am writing to you to thank you for your courtesy and for all the help you have been to me in my studies on animal tracks."

DEATH OF A FRIEND

Trees, which are so vital to our own very existence, carry a particular appeal to Phil Dibert. Recently he devoted his Page One column in the *Tyler Morning Telegraph* to a tree's passing. His lead was: "We are mourning the loss of an old friend, one who stood by us through storm and calm, comforted us when our spirits were low and cooled our fevered brow in the searing torture of a semi-tropical afternoon; a friend whose soft night whisperings often lulled us to sleep after a distracting day; whose sturdy strength was an eternal bulwark against the vagaries of weather and circumstance; whose God-given symmetry was a constant inspiration. Our giant, majestic red oak tree is dead."

INVITING DISASTER

The Texas game warden adjusted his field glasses to bring the violently bobbing boat into focus. The objective of his scrutiny was an ordinary fourteen-foot skiff a half mile offshore at Rockport, on the Gulf Coast. It was such a squally day that more substantial vessels remained in the harbor. "Just another poor fellow who doesn't realize the risk he's taking," observed the warden. "Looks like he'll make it though, if he times his swing right at the harbor entrance." The warden's concern was particularly pointed because another such fellow who also hadn't realized the risk had been lost a few days before with an adult companion and a small boy. They had searched two days and nights before finding the trio drowned.

SASSY SNAKE

W. D. Bond, the college professor who writes outdoor lore for the *Abilene Reporter-News*, reviewed some past experiences with reptiles, concluding with a hassle with a snake in a tree which, he decided, seemed out of place. Bond rocked the snake out and then promptly lost his professorial dignity because the reptile chased him smack off the premises.

THEY SURE ARE!

All of this hubbub about honest fishermen certainly is justified by this one: AP dispatch from Indianapolis, Ind.—"The conscience of a woman who fished in an Indiana lake near her home a number of years ago without a license bothered her. A letter received at Gov. George N. Craig's office from Sarasota, Fla., contained \$2 and a note saying she was sorry she had violated the law."

MIGHTY BASS

Earl Golding, outdoor editor of the *Waco News-Tribune*, has been keeping the box score on "Old Big Boy," a giant black bass on Big Rocky Creek. Earl writes that the huge fish has whipped five or six anglers. Last man to make contact took a terrific stomping, according to Golding, since the fish "tore the entire rigging right out of the man's hands . . . pole, line and all."

FLATHEAD CAT FLASH!

Troubles besetting fisheries men in trying to have flathead, or yellow, catfish reproduce in captivity, so that their young could be parceled out to help reduce sunfish overpopulation, were pointed up by an incident in the Dallas zoo. They had a female and a male flathead, looking ahead to the time when the pair might be induced to spawn on the premises. This time domestic problems interfered. The female hauled off one day and killed the male.

MIGHTIEST HUNTER

Wayne Gard, editorial staff writer for the *Dallas Morning News*, chronicled the memories of folks around Rotan and Snyder about the mighty deeds of J. Wright Moorar, early settler and successful rancher, who died in 1940 at the age of 88. He was credited with having shot an estimated 20,000 buffalo during his market hunting days through the midwest and later on into the Texas Panhandle.

HEIL TO THE HEEL!

Speaking of resourcefulness! Game Warden A. P. Boyett, who helps keep house for the Game and Fish Commission's traveling zoo, recently used the rubber heel of his shoe to patch a leaking water hose supplying a fish tank. Otherwise, the fish would have perished, since more substantial parts did not arrive in time.

DON'T OVERLOAD BOATS

Gus T. McMammal, after shaking from sheer terror at some of the dangerous scenes enacted on Texas lakes, suggested this Minnesota tragedy should be cited as fair warning against overloading boats: Seven persons, including five children, ages from eight to fourteen, perished when a squall upset their fishing craft.

THE HARD WAY

Two Austin young fellows have established a technique for recovering boats or motors in deep water. They can operate as far as 200 feet below the surface. How do they do it? Just sink your boat and we'll show you—for a fee—they answered.

GUNS

and

SHOOTING

AUTOMATIC SHOTGUNS

By JOHN A. MASTERS

Last year about this time, I wrote a piece about shotguns. Since so many models were available, for the sake of space I devoted the entire article to slide actions, or so-called pump, shotguns. This year, I will start off with automatic, or more strictly speaking, semi-automatic, shotguns, and later, I will devote a piece to the time-honored double-barrel and perhaps a bit on bolt action shotguns.

Just about everyone seems to have a new automatic on the market this year. For a long time, every automatic shotgun on the market was based on the original Browning design, and some still are. As a matter of fact, Browning still makes the same old square backed auto, and it was and still is a very good shotgun.

There are several ways a shotgun can be made self-loading. Rather than discuss these separately, I will discuss the workings of the gun together with its other points.

First off, the Browning. This gun features the so-called "blow back" design. When a shell is fired, the gun, due to the inertia of the breech block, remains closed for a long enough period for the shot to leave the barrel. The back thrust on the block causes it to move to the rear, compressing a recoil spring. When the block has reached its limit of movement to the rear, the recoil spring shoves it forward again.

As the block moves to the rear, the fired shell is extracted and thrown out. As the recoil spring throws the block forward, a fresh round is inserted into the chamber, and the gun is ready for another shot. This whole operation takes place in a fraction of a second, and one is not able to detect the delay in the movement of the block due to its inertia, but to answer a long-standing question, none of the power of the shell is wasted in moving the block.

The back thrust on the bolt is always there. It is evident that the shot charge and gases have already left the barrel before the block moves back, or one would get a snootful of gas with every fired round. Thus, an automatic using the blowback principle shoots just as hard as any other gun.

In the straight blowback action, the barrel is locked to the block during part of its travel, which leaves the shell sealed in the firing chamber. As the block moves the rear, the barrel is unlocked, and a recoil spring in the forearm returns the barrel. Shortly afterward, the block is returned, and is again locked to the barrel.

This movement of the barrel and block takes place rapidly, and adds to the apparent recoil of the gun. Thus, many shooters will take an oath that an automatic kicks harder than a pump.

This blowback design is a good sound action, as has been proved by years of service. Browning makes several different gauges of shotguns utilizing this principle, and all are good dependable weapons. My favorite Browning is the so-called "Sweet Sixteen"; the entire Browning line may be had in the regular weight, or may be obtained in the so-called lightweight model. I personally do not believe a better shotgun is built, although a different design might be preferable to some shooters.

Until fairly recently, Remington made a shotgun that was just like the Browning in design, and is, as such, just as good. After World War II, Remington came out with a streamlined version which still utilized the blowback principle, but had certain refinements that made the

Shootin' Shorts

Remington is now marketing their semi-automatic rifle chambered for the 30-06. Outwardly, the gun resembles the 760 Remington slide action. It has the same sort of bolt, and the magazine is similar to the 760. While no gun for the hand-loader or accuracy nut, it should prove to be a very satisfactory hunting weapon. It has performed satisfactorily with all usual 30 caliber bullet weights.

Had a chance to fondle the new 99 Savage Lightweight the other day. Mighty nice little gun. Kinda wish I had one in 250-3000 equipped with a good aperture sight for walking up whitetails. Same action as previously,

but somewhat trimmed down. Barrel is slimmer, as is the fore end.

Lots of straws in the wind on new gun developments, some pretty definite, some just rumor thus far. Talk of a .308/6mm in the new 88 Winchester, a 219 Zipper on the 336 Marlin, and some .6mm in the fine little Remington 722.

As expected, Winchester is now marketing the lightweight Model 70 in 270 and 30-06. Should be in 257 Roberts soon.

Joyce Hornaday is on the market with a new round-nose 220 grain 30 caliber bullet. Should be a fine bullet for brush and for big stuff with the 30 caliber Magnums.

Good Duck Hatch in Progress

gun more desirable. For one thing, the block unlocks from the barrel a bit sooner, and the barrel returns sooner. This results in some lessening of the apparent recoil. Elimination of the square back design typical of the Browning design resulted in a more pleasing streamlined appearance. The gun, while basically the same action, seems to come back without the typical Browning "whop," and is pleasanter to shoot.

Remington added another feature I like. When loading the gun, it is not necessary to press the action release button. The elevator goes down with no effort, and one can simply stuff shells in.

Remington guns are good sound functional weapons, but lack some of the niceties of machining their earlier models had, and makes use of a number of fabricated parts. To a gun nut, this is a bit distasteful; to the average shooter, it is no matter to consider.

Winchester last year announced their long-awaited entry into the automatic field in the person of their Model 50. This gun makes use of a new principle in shotguns, although it has been used in rifles for some time. It is an adaptation of the Williams floating chamber. In this gun, the chamber "floats"; *i.e.*, it is free to move a short distance. When the gun is fired, the chamber moves back a short distance, overcomes the inertia of the block, and causes it to fly back, compressing a recoil spring in the stock. The block extracts the fired case as it goes back, and picks up a fresh round as it returns. The barrel does not move. This system again gives a reduction in the apparent recoil, and permits making barrels that may be easily changed from gun to gun.

The Winchester Model 50 has not yet stood the test of time, but underwent a long period of development, and has been highly recommended by leading shooters and writers all over the country, and is undoubtedly a fine serviceable weapon. It has a pleasing appearance, and handles and points nicely.

The newest auto in the field uses yet another principle. I have just received my sample, and today went out and busted up a few clay birds. This new gun is the J. C. Higgins

Waterfowl nesting in western Canada's prairie provinces produced a good first hatch. The over-all picture in mid-July showed the brood average as being better than six young, the long term average. Second nesting attempts by ducks which lost first clutches were in evidence, together with broods from later-nesting species like lesser scaup, red-head, baldpate and blue-winged teal.

After treating on the production angle in the July report of Ducks Unlimited, Chief Naturalist Bert W. Cartwright said "Conditions as they exist over the whole range and the duck crop now in sight are both infinitely better than they were last year at this time."

The report states that nesting success had been variable to mid-July throughout the prairie region and among different species. In Manitoba, first nestings by Mallards and Pintails in pothole country was disappointing. Blame was placed on floods, agricultural activities and predation. Best nesting success in this area to date goes to the Canvasback, a species which nests over water. Up to June 25, recorded Mal-

lard broods averaged 9.1 young.

A heavy duck crop from first nestings is reported from both eastern and western Saskatchewan. Yet the famed Caron Potholes study area of southern Saskatchewan, a region with a nesting density of over 100 breeding pairs per square mile, showed only 12 per cent success from first attempts.

The same heavy production is attributed to southeastern, southwestern and central portions of Alberta. A considerable area of southern Alberta is undergoing drought conditions and some broods have been lost, especially among the Pintails. Canada geese are enjoying a good year in this region, particularly in the Eastern Irrigation District, where many Ducks Unlimited projects are located.

Swinging to water conditions generally, Cartwright states, "Except for the drought area in southern Alberta, there is ample surface water almost everywhere to see hatches from second nestings safely on the wing. . . . This is subject to a continuation of favorable weather conditions."

Model 60, made by High Standard, and marketed by Sears, Roebuck & Co.

The Model 60 is a fixed barrel auto. It makes use of a gas operated piston to kick the block back. The usual recoil spring brings the block back to battery. In the usual manner, the block extracts the fired case on the backstroke, and picks up a fresh round in its return travel.

This is a nicely made shotgun, and so far has performed very well. I have not yet checked it out to my complete satisfaction, but Sears tells me that they spent several years in developing the gun, and that extensive field testing went into the gun.

Its principle of operation is much the same as the celebrated Garand service rifle, and should prove quite satisfactory. I will report further as my testing of the piece progresses.

That about covers the field except for Browning's new, so-called Double

Automatic. This new gun has a pleasing streamlined appearance, in contrast to the usual square backed Browning. It holds only two rounds, hence the name. I have not yet had a chance to look one over, but it is an interesting addition to the field, and will likely prove quite popular.

As noted earlier, Browning's regular auto may be obtained in 12 and 16 gauge. Remington supplies their Auto in 12, 16, 20, 28, and .410. Winchester supplies the Model 50 in 12, with plans for a 20 gauge perhaps later this year. The Higgins Model 60 is available only in 12 gauge.

Any of these shotguns will serve the shooter well. I personally am a pumpgun shooter, so I would not favor any particular one. I should think that one may safely be guided by his pocketbook as well as any other criterion, since any of these guns will give good service.

trout production out of proportion to the rest of the program? How much does stocking with warm-water fish benefit angling? How many stocked fingerlings survive to reach a desirable size? What percentage of the planted stock is recaught by fishermen? For individual waters, what kind of fish should be stocked? How many? What size? When?

Under what conditions, and to what extent, does "corrective" stocking of warm-water fish benefit angling? What factors limit survival of planted fish?

Regulations: Which of the regulations now in effect really benefit angling? Do we need size limits? For which species? What should the limits be, if needed?

Are creel limits desirable? For what species? What limits?

Are closed seasons helpful? If so,

for what periods should they be imposed?

Where should commercial fishing be permitted? What restrictions should there be on commercial fishing, where it is permitted?

To what extent do present enforcement methods prevent violation? How can they be improved?

Habitat improvement: What factors now limit fish production in different types of habitat? What part, if any, is played by siltation? Pollution? Water diversion? Dams? Floods? Other environmental factors?

Under what conditions can fishing be improved, practicably, by use of stream or lake "improvement" structures? What is the effect of water-level fluctuations in reservoirs, streams, and lakes on food production, fish production, and fishing? To what extent does turbidity limit fish food and fish production?

Managing fish populations: What are the habitat needs of our more important fish species? How much can fishing be improved by controlling rough fish? How can rough fish be controlled, economically? What part of the fish popula-

tion is caught by the anglers? What part may be caught without adversely affecting future fishing? Under what conditions is the introduction of exotics desirable?

What kinds or combinations of fish will yield the most satisfactory angling in farm ponds? In big waters? In clear waters? In muddy waters? In weedy waters? In cold waters? In warm waters? In "cool" waters?

Other questions: Originally we listed at least a hundred additional questions, then discarded them because of space limitations. Any qualified fishery worker can not only list questions which need answering, but he can indicate which ones, in his state, are most in need of answering. He can suggest, too, which research jobs can be expected to give a maximum return for the investment of time and funds.

All states might well list what their over-all fact-finding needs are, and then direct their attention to those which can be expected to benefit fishing most.

The future of our fishing will depend to a considerable degree on the quantity and quality of our fishery research. Fact-finding has received its greatest impetus through the enactment of the Dingell-Johnson Act (federal aid to state fishery programs). Though still in its infancy, fishery research has already pointed the way to better fishing in numerous instances. There is considerable room for improvement in both the kind of research and the amount. This improvement must be forthcoming if we are to have good fishing despite constantly increasing fishing pressure. There is evidence that it will be forthcoming.

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COVER ART NEEDED

Artists have until September 10 to submit paintings of Texas wildlife for possible use as covers for TEXAS GAME AND FISH Magazine. Several paintings for use within the next year will be selected. Rate of payment will be \$50 for each one bought.

Details concerning subject matter, medium, size, etc., will be found on page 25 of the July issue.

Hunters May Apply For Antelope Hunt

Hunters have until August 31 to apply for permits to participate in this fall's antelope hunts in the Trans-Pecos and Panhandle regions of Texas.

Dates for the Panhandle hunt, where bucks only will be hunted, are October 12 through October 17. In the Trans-Pecos, bucks will be hunted October 3, 4, 5 and 8, 9, 10; does will be hunted on some ranches October 1, 2, 6, and 7. The exact number of animals for which permits will be issued for the carefully controlled hunts will be announced upon completion of population counts.

Hunters may request application blanks and full information by writing the Game and Fish Commission in Austin.

The Thermocline

Continued from page 17
thermocline is bound to keep us fishermen more or less baffled, since its depth can vary from day to day—our fine spot of one day may be utterly barren of fish the next. But, knowing about it will make us aware of the fact that, in summer, it's usually futile to fish at a greater depth than 45 feet in the average lake. And if a good spot of half that depth, or shallower, suddenly and completely fails to produce, when there's been a strong offshore wind, the thermocline has probably moved above it, and it is futile to waste your time there.

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A frank appraisal of

A Boy and His First Gun

and what parents should do about it.

By JOHN MADSON

From the Iowa Conservationist

Sooner or later, the parents of most boys are caught between two fires: a boy, longing for a gun of his own, and the reports of hunting accidents in the newspapers. These parents can't help worrying about the accidents, and whether their sons are really old enough for a gun.

The proper age to own that first gun is a tough thing to say. Some boys are ready at 12; some are never ready. Most boys of 14, however, are just about old enough for their own .22's. But more important than age is the boy's common sense and sense of responsibility. For instance:

1. Does he show good judgment? Does he make sensible decisions and use his head in most situations?
2. Is he responsible? Does he show respect for other persons and their property? Does he handle money well, carry on his share of work around the house? Can he be depended upon?
3. Is he obedient? Does he mind his parents and follow their instructions and advice? Does he respect their wishes, even though they conflict with his companions' ideas?
4. Does he know what a gun is? Does his attitude toward firearms point to a maturing, sensible view, or is he still in the cowboy and Indian stage?
5. Has he ever handled a gun, either with his parents or with other adults? If he has no shooting experience, are you prepared to see that he gets some from a shooter that knows his business?

A boy shouldn't be given a gun and then, like Topsy, "just grow." He may learn gun safety the tragic way. He should be carefully schooled

by an adult, experienced hunter and taught guns, gun handling and respect for the safety and property of others. A youngster should never be handed a gun and then turned loose like a wild colt.

Before a boy has his own gun, it's a good idea to take him hunting a few times, making him more familiar with guns and their use. If the boy has never been hunting or shooting and you still think he should learn with his own gun, give him his own gun. But take just the one gun along, or have him carry his gun unloaded until you're ready for shooting. Until he *really* knows guns and their proper use, don't let him go shooting alone or with other boys.

Sometimes the boy who wants a gun has a non-shooter father. In such a case, perhaps the boy can be instructed by an older brother, an uncle, or a neighbor who knows gun-handling and knows it well. If the father is a sportsman, the situation is ideal—a father-son hunting team is a fine partnership, and both boy and man will learn a lot.

Forbidding a boy the use of guns only compounds the danger of firearms. If the boy is gun-happy he'll probably be out along the river with some other boys shooting and it's best that he knows what it's all about.

Every boy should have some gun training, and it's a rare boy who doesn't want it. Sooner or later, as boy or man, he'll be handling a loaded gun. How well he handles it depends on his parents, his early shooting companions, and his gun training.

Finding that first rifle under the Christmas tree can be one of life's big moments—to the lucky boy, and the dad who gave the rifle to him, we send our heartiest Christmas greetings and best wishes for a lifetime of sport and safe shooting.

counties involved. Hunting of antlerless deer was deemed necessary on only 509,766 acres of the three-county total of 1,879,680 acres, or approximately one-fourth of the total acreage in the three counties.

The estimated 9,000 surplus deer represented one surplus deer to every 56.42 acres in the 509,766-acre area to be hunted. The kill of 3,329 antlerless deer was slightly over one-third of the surplus deer in the area, or one antlerless deer to every 153.12 acres.

Many of the remaining 5,671 surplus deer later died of starvation, or "miss meal colic," as the ranchers refer to it. Timely rains, falling at periodic intervals, have saved the lives of many deer which undoubtedly would have perished had not range conditions improved as a result of these rains.

The 1953 antlerless deer hunt a year earlier, the first of its kind ever held in Texas, covered 51,272 acres in two counties, Mason and Gillespie. Only 52 landowners participated in that first "doe hunt," compared to 271 landowners in Llano, Mason, and Gillespie Counties the following year. These 52 landowners were issued 1,136 antlerless deer permits and 946 antlerless deer were harvested by hunters. The dates for the 1953 season were the same as those for the 1954 season, December 1 through December 15.

Of the 946 antlerless deer

bagged during the 1953 season, 693 (73.25%) were adult does; 139 (14.69%) were doe fawns; and 114 (12.06%) were buck fawns without hardened antlers protruding through the skin. No adult bucks with either shed or undeveloped antlers were bagged as antlerless deer during the 1953 hunt. It is believed the reason for this was that the effects of the drouth has not yet hit the deer herds in the hunted areas with the severity with which it struck a year later.

The general condition of deer bagged during the antlerless deer hunt in 1953 was much better than that of deer bagged during the next year's hunt. This was readily apparent, as most of the same acreage on which antlerless deer were harvested in 1953 was hunted again in 1954.

Of the 52 ranches where antlerless deer were harvested, in 1953, severe and predicted die-offs occurred on 11 of them after the season due to failure to remove enough surplus deer. All were located north of the Llano River in Mason County. Surveys made between the 1953 and 1954 seasons disclosed surplus deer, especially does and fawns, on the remaining 41 ranches which participated in the 1953 hunt. All but three of these 41 landowners took part in the second hunt in 1954. The remaining three ranches, south of the Llano River in Mason County, did not choose to participate in the 1954 hunt.

Following the close of the 1953 hunting season, many interesting and enlightening points were brought to light from landowner interviews, deer census checks, and field observations by personnel of the Game Department. One of the most significant findings turned up in north-eastern Gillespie County and across the line in southeastern Llano County. Following the heavy harvest of both bucks and does in 1953 in the Willow City Loop area of Gillespie County, it was determined by deer census counts made in October, 1954, that there was a remaining deer population in that area of only one deer to 4.66 acres. Just across the line in Llano County, where existing laws permitted the taking of bucks only in 1953, census counts made at the same time disclosed a deer population of one deer to 4.66 acres!

Subsequent census checks made throughout the Central Mineral Region in Llano, Mason, and Gillespie Counties have shown that the maximum carrying capacity of the range, for deer, under prevailing livestock producing practices and range conditions, is one deer to 4.70 acres. Consequently, landowners in north-eastern Gillespie County harvested 661 of their surplus deer, and received \$10.00 each for them, the price agreed on by the landowners prior to the opening of the season. Over the line in Llano County, landowners had to watch many of their surplus deer die from starvation, since there was no way they could legally let hunters harvest them. Llano County landowners watched their deer die and go to waste, receiving nothing for them, while just across the county line, Gillespie County landowners grossed a total of \$6,661—and both ended the year with exactly the same number of deer! Hunter and landowner alike lost in Llano County.

Neither the Llano County rancher nor his buck hunter benefited from the surplus of does and fawns the range was carrying. To the contrary, these surplus deer were consuming vast quantities of range forage that, had they not been present in such large numbers, would have provided more food for the legal bucks in that area.

There is a direct correlation be-

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tween the quality and quantity of food a buck consumes and his body size and antler growth. The more deer in a given area, the less food each deer will get, just as is the case of fish in a farm pond. Then does it not follow that if surplus deer are not removed to provide more food for those that remain, a landowner might seriously affect the size, antler growth and all-around desirability of the bucks produced on his ranch?

In very blunt language, if better bucks are to be killed in the years ahead, more does will have to be removed, since a deer herd cannot be kept in check by killing off the bucks only.

One rancher who had participated in both the 1953 and the 1954 antlerless deer hunts harvested 57 bucks and 185 does in 1953, and 42 bucks and 125 does in 1954. For the privilege of hunting those 409 deer, the rancher received \$9,600.00. Prior to the 1953 antlerless and buck deer seasons, there was an estimated total of 1,252 deer of both sexes on this ranch. In February, 1955, after two years of hunting both bucks and does, during which 409 deer were bagged by hunters, census counts showed there was an estimated total of 913 deer on the ranch. Note that this count was made before 1955 fawns were born. Abundant rainfall has produced much forage for deer on the ranch, preventing any appreciable die-off, and even if this year's fawn crop is far less than average, the rancher will go into the 1955 deer season with just as many, if not more deer than he had prior to the 1953 season.

In reaching this absolute saturation point under prevailing range conditions and management practices, deer have done serious and in many cases, irreparable, damage to their habitat. Many of the preferred food plants have been completely eliminated from the range. The browse line on trees of nearly every species, including live oak, Spanish oak, post oak, blackjack, Mexican persimmon, evergreen sumac, hackberry, mesquite, cedar, and beebush, is well out of reach of all but the largest and strongest deer. Fawns and yearlings, from whose ranks next year's bucks must come, in most cases, being unable to reach

New Game and Fish Laws

• Continued from page 7

prohibited. Minnows may not be taken or possessed from lake. Fish from lake may not be sold. Regulations as to other waters remain the same.

Taylor County: Trotlines prohibited in Lytle Lake. Not more than 2 hooks may be used on each pole and line or line used in fishing, in Lytle Lake.

Waller County: Seines and nets may be used as provided under general law, effective Sept. 6. Minnows from public waters may not be taken for transportation beyond county for sale, nor sold outside of county. Transportation beyond county of more than 250 min-

the lowest leaves on trees during a period of the year when there is little or no food available on the ground, are the first to succumb to malnutrition and starvation each year.

The ideal solution to the problem of too many deer and too little food might be the complete removal of all deer for a long period of time, possibly for five years. Since such a drastic measure is neither feasible nor advisable, the only alternative is reduction of the deer herd by the most logical and practical means, calculated to bring about a gradual range recovery over a much longer period of time. The most practical method of accomplishing this is to let the hunter do the herd reducing. It has been established as fact that hunters will gladly pay to harvest deer which would otherwise starve to death.

Along with a reduction of deer numbers must come a corresponding reduction of livestock grazing pressure or nothing will be gained. If the carrying capacity of each ranch in Texas, where deer are present in any appreciable numbers, is calculated on the basis of six deer to each grown cow, and on an animal unit basis for the particular vegetative type or types involved, and both deer and livestock numbers held to the safe carrying capacity of a particular range, then game management will have reached a new high in Texas.

It is impossible to keep a deer herd in check by killing off all the legal bucks each year. A number of landowners in the Hill Country have proved that to the satisfaction of themselves and others for many consecutive years.

nows by any person, or of any minnows by commercial minnow dealer or his agent, prima facie violation of Act.

Wichita County: Minnows may not be taken for sale outside county, nor transported beyond county for sale, nor sold beyond county. Transportation of more than 50 minnows beyond county prima facie evidence of violation.

Wood County: Rough fish may be taken by use of 2-inch mesh net or seine and by use of hands grabbing within the seine but may not be sold.

FURBEARERS

Henderson and Van Zandt Counties: Mink season closed until 1957.

COMMERCIAL LAWS

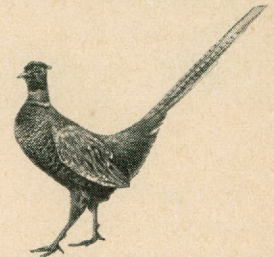
Buffalo: Owner of land on which buffalo have been stocked at landowner's expense has right to dispose of surplus buffalo upon obtaining permission from Game and Fish Commission in writing. Applicant for permission must make affidavit statement to Commission. Commission, after investigation and upon certain findings, may authorize disposition by sale or slaughter.

Pheasant: See "pheasant" under "Hunting Laws."

Shooting preserves: Law amended to define "shooting resort," and provide for markers for resort; prescribing that 500 quail minimum must be released annually or 500 pheasant or chukar on each six hundred acres of land licensed as a shooting resort, such birds to be banded and marked. Fee for shooting resort is \$10. Prescribing open season on shooting resorts Nov. 1 to Feb. 10 for quail; Oct. 1 to April 1 for pheasant, chukar and other pen-raised fowls and/or imported game birds. Other provisions substantially un-

• Continued on next page

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• *Continued from preceding page*
 changed for shooting preserves. (Effective Sept. 6)

POLLUTION

Game and Fish Commission now required to enforce rules and regulations promulgated by Commissioner of General Land Office to prevent pollution of gulf lands waters in oil operations. Enforcement now the duty of the Commissioner of General Land Office.

REGULATORY AUTHORITY

Game and Fish Commission has been given regulatory authority over regulations pertaining to wildlife and fish in the following counties: Bell, Blanco, Bosque, Bowie, Clay, Coryell, Hill, Johnson, McLennan, Medina, Milam, Montague, Parker, Somervell, Sutton and Wish Counties; and over deer and turkey in Lavaca County. Said Commission has been given regulatory authority over its wildlife management areas.

TRESPASS

It should be noted that in the counties placed under regulatory authority, permission is required from the landowner or agent in charge before hunting, trapping or fishing on private lands and waters, whether such areas are enclosed or not, and regardless of the means or methods used in hunting, trapping or fishing.

The public has no right to use any road which has been continuously under fence of an adjoining landowner for twenty years.

The Sabine River is non-navigable, and therefore not public for hunting and fishing purposes, from its source to the east boundary line of Hunt County. (This is a legislative declaration of an already existing fact and should not be construed to mean that the river becomes public at the Hunt County line.)

wing as a migratory bird. The whitewing season is now set by the Secretary of the Interior based upon the recommendations of the Fish and Wildlife Service. The Fish and Wildlife Service, in turn, makes its recommendations based on the recommendations of the game commissions in Texas, New Mexico, and California which are the nesting grounds of the whitewing dove in the United States.

For the past two years the Texas Game and Fish Commission has recommended a closed season for the whitewing dove in Texas. In 1954 the Commission's recommendation for a closed season was complied with, and there is no reason to expect that it will not be complied with this year.

The boat-tailed grackle, green jays, and other predators are also partially responsible for the reduction of the whitewing population. The grackle is considered by game biologists to be responsible for more predatory acts against whitewing nests than all other predators together, and in many nesting areas predators are responsible for the destruction of more than 75% of whitewing eggs and young.

Another factor contributing to the decline in the number of whitewings is unfavorable weather such as the big freeze in 1951 and Hurricane "Alice" in 1954. In 1951 the estimated pre-hunting season population of whitewings was 197,150 in comparison to a 900,000 bird pre-hunting season populations estimated the previous year. Possible causes for the reduced numbers of whitewing in 1951 were reported by Texas Game and Fish Commission biologists to be killing freezes in January and February of 1951, and the lengthy drouth in northeastern Mexico that had preceded the freezes. Hurricane "Alice" was reported by Game and Fish wildlife biologists to

have reduced the total number of young fledged in 1954 by 36.6% considering that the storm occurred at the recorded peak of the nesting period.

The Texas Game and Fish Commission in cooperation with the federal government carries on a continuing research in South Texas on the whitewing dove under Pittman-Robertson Project No. W-30-R-9. Biologists John T. Harris and W. H. Kiel Jr. are currently assigned under this project to study the numbers and distribution of birds, location and nesting concentrations, nesting success and survival of young, changes in vegetation suitable for nesting, and hunter harvest during the open season.

The whitewing dove begins its move into South Texas from the tropics of Mexico and Central America beginning the latter part of March. They continue to arrive until the latter part of May. Game and Fish biologists begin their work about the middle of April when courtship and nest building begins. They lay out a series of check areas and make nest checks during approximately the next 15 weeks of the nesting season. A complete survey of each nest in the check area is made once each week, and an accurate record is made of nesting progress. This past year biologists Harris and Kiel made weekly checks on eight 1-acre citrus plots and two 1/4-acre brush plots. The citrus plots had 30-200 nests per acre, and the brush plots had from 60-400 nests per acre.

Courtship and nest building reaches its peak around the first of July. From this time on there is a gradual decline in breeding and nesting activities in the rookeries until the end of the breeding season the latter part of August. The fall departure of the birds from Texas varies; however, they usually begin to move south around the first of September and the migration is usually completed by the middle of October. Some of the birds may remain in the Rio Grande area until the first of November if the Texas weather does not become too rainy and cold.

Commission wildlife biologists



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have determined by comparing the post-nesting and post-hunting season populations of the whitewing, and by allowing for normal predation, that the whitewing dove nests at least two and possibly in some cases three or four times annually.

The whitewing nest is a hastily built structure from materials in the immediate vicinity of the nest. In the South Texas brush areas the nests are constructed of materials from the mesquite, ebony, catclaw, hackberry, etc. In the citrus orchards nests are usually constructed from citrus twigs and grasses.

A normal clutch for a pair of whitewings is two eggs, though three or four eggs are sometimes found in nests. W. S. Jennings, Assistant Director of Wildlife Restoration, states there is evidence to support the contention that when there are four eggs in a nest a second bird is responsible for laying at least one of the eggs. The eggs are generally laid on successive days, and in a pair of young there is usually one bird that is one day older than the other.

Both the male and female of the species assist in caring for the young birds. Consistent nest watching indicates that the female bird usually leaves the nest to feed and get water about 9 o'clock in the morning when the male bird arrives to take over his duties. He stays on the nest until early in the afternoon, and returns in the early evening hours to relieve the female for the afternoon feeding. The young birds are fed by regurgitation.

When first hatched the young whitewings are covered with a whitish down. By the end of the first week they have lost most of the down and at two weeks are almost covered with long feather quills that are almost fully opened. They cannot fly well at this time because the tail is too short. The tail reaches its normal growth during the third week and the fledgling dove attains a smoothness and fullness of plumage closely similar to that of the adult. (See series of pictures, pp. 12 and 13.)

Jennings indicates that the Texas Game and Fish Commission has several responsibilities in dealing with the problem of reduced numbers of whitewing in Texas. In the first place, the responsibility for the con-

trol of hunting pressure lies with the Commission. In discharging that responsibility wildlife biologists are conducting a continuing research program in whitewing nesting areas. They make nesting counts and estimate potential post-hunting season populations. An estimated hunting season population is reported to the Commission before it makes hunting-season recommendations to the U. F. Fish and Wildlife Service.

If a hunting season is recommended Commission biologists and wardens are responsible for a smoothly operating hunt, and the prevention of violations of hunting laws. They also must check on the number of cars, number of hunters, and the success of the hunters. When entering the shooting zone hunters are requested by Commission personnel to pick up a questionnaire printed on a sack. The questionnaire is to be filled out by the hunter who places one leg from each whitewing killed in the sack and returns the sack to the Game and Fish representative when leaving the shooting zone. The legs turned in by the hunters are carefully checked to determine the total number of birds bagged, and the percentage of the total number of bagged birds that were hatched during the past nesting season.

In the second place, the Game and Fish Commission may see fit to initiate a program consistent with existing laws for the control of predators. At the present time Commission biologists are conducting research to determine the percentage of loss to predation, kinds of predators involved, and method for controlling these predators. No extensive predator control program is currently being pursued.

Finally, the Commission must take whatever action is deemed necessary with available funds to provide suitable whitewing nesting grounds. Currently the Commission is considering the advisability of the purchase of suitable tracts of brushland in South Texas which are to be used for nesting areas. This action has been recommended by Commission biologists because of the destruction, through large scale brush clearing programs, of suitable whitewing nesting habitat.

The assistant Director of Wildlife

New Lake to Open

The towns of Ranger and Eastland have cooperated in the building of a dam and reservoir, Lake Leon, located about equal distance between the two towns.

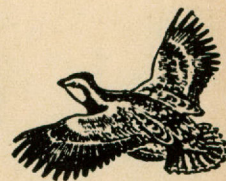
A formal opening is to be held September 3 and 4 and a varied and colorful program has been planned. Congressman Omar Burleson will be the principal speaker on September 3. Three hour professional boat races will be held, with between sixty and seventy racers participating.

On September 4 the well-stocked lake will be open to anglers during an all-day fishing rodeo. Prizes will be awarded for various angling achievements.

Many other events are to be staged during the program, including a mock helicopter "sea rescue" and a bathing beauty revue.

Restoration feels that Commission biologists have grasped the problem involved in preventing the extinction of the whitewing. Jennings points out that such a program will require a consistent approach to the maintenance of suitable habitat, a careful control of the hunting pressures applied to the whitewing, and possibly control measures against predators. He feels that these things can be accomplished through the combined cooperative efforts of local inhabitants and the Texas Game and Fish Commission.

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chances of hooking the catfish.

Experience and studies have shown that during daylight hours, catfish seek shelter under logs, rocks, brush piles, or in holes in the river banks and wander little, especially if the water is clear. Most of the foraging for food is done in the late afternoon and at night. In muddy streams, however, the fish will move around during the daylight hours. But the success of catfishing lies in the fact that if a tempting morsel of food is put before him, even while he is under his log, the old catfish will not refuse it. Excellent fishing is to be had also during "high water," particularly below dams after the gates have been opened. Catfish are known to eat more, and are consequently caught with greater frequency, during warm weather than when the water is cold.

Obviously the next logical question after knowing how to catch the fish is, "How do you cook them?" The flesh, flaked from the bones, cooked with tomatoes, potatoes, onions, and a bit of bacon makes a chowder fit for the most discriminating gourmet. Naturally the meat can be rolled in meal and fried in deep fat. And one of the most mouth-watering techniques we have heard of is suggested by Captain John Wood of the Enforcement Division; he barbecues his fish. After skinning the fish and removing the head and guts, he salts and peppers

lowed them before the hunter's very eyes! What really happened was that the hunter came upon the snake at the exact moment she was giving birth to her five to twenty-five living young. She postponed the procedure long enough to challenge the intruder. In the excitement of killing the snake the newly-born snakes escape in nearby foliage and the unborn youngsters are mistaken for the little fellows who had disappeared in their mother's coils.

The accompanying photograph of a Western Diamondback Rattlesnake depicts interesting information about an unusually fine Texas specimen captured in Hidalgo County. The big snake, requiring lively work on the part of four persons, measured six feet nine inches long

the fish and then begins cooking on an open piece of buttered aluminum foil. When the fish is about half done, the foil is folded around the fish and turned over. Cooking is then continued until the fish is well done. During the cooking process the fish is basted with barbecue sauce (Captain Wood likes his "heavy on the salt") especially in the body cavity. The cooking time for a three-pound channel cat is about three hours.


Doubtless, many questions pertaining to channel catfish fishing have been left unanswered. Much of the information just passed out came from some of those who do the fishing. If there should be other questions, the author heartily recommends that you do as thousands of other sportsmen do—"ask your warden."

from nose to base of tail, exclusive of the two-inch long rattles which were ten in number and one inch wide. Rattles do not count in the over-all length because of the ease in breaking off or adding to them. Figure No. 1 shows the dead reptile measuring six feet eleven inches, including the rattles, after being killed with ether and tied to the stretching board. Note the three yardsticks on the left side of the picture. Figure No. 2 shows all anchor wires removed except the top tie near the head, giving the reptile thirty minutes to completely relax and stretch of its own dead weight of nine pounds, eight ounces. It is noted that the snake stretched three inches below the stretching board. Such elongation is prevalent when a dead specimen is tied to a support or dragged behind a vehicle. Figure No. 3 shows the freshly removed hide stretched to the amazing length of eight feet, eight and one-half inches, including the two-inch long rattles. The increased length of the hide was 26½ per cent, while the width increased from the original ten inches in circumference to twelve and one-quarter inches, or 22½ per cent.

Hides taken from the really big Florida diamondback rattlers measuring over eight feet live length would measure upwards to ten feet in length. The mighty Florida snake and the Western diamondback rank as the world's two heaviest and most powerful venomous reptiles.

Spend some time reading about our poisonous reptiles as you would study cooking recipes or fishing equipment and guns, and you will add immeasurably to the joys and peace of mind on your next outing. Remember the disturbed snake is likewise frightened and is quite content to go his way if left alone.

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Editor:

Enclosed find photo of three black deer that were killed in Comal county in the 1954 season. Can you explain what causes this type of deer?

The deer in the photo had more soft hair, and no white showing except on the tip of the tail.

I am also sending you a post card of the first black deer killed in Comal county in 1935 by Otto Penschorn.

The top left deer in the picture was killed by Marvin Wright; top right by Bill Sever, and the one on the bottom was killed by Albert J. Rahe.

Louis H. Marion
317 Lakeview Blvd.
New Braunfels, Texas

(W. S. Jennings, Assistant Director of Wildlife Restoration, says this is an unusual occurrence. The deer have developed through a melanist tendency in breeding which may have become dominant in that locality. It will be interesting to see how many black deer are killed in Comal county in the years to come.)

Editor:

They grow big here in East Texas, and a 60-pound catfish is any fisherman's dream. L. R. Shelton of Tyler had his dream come true. The fish was taken on a wooden pole, set off the fishing pier of Shelton's Lindale Club Lake place near Tyler. It gave him quite a tussel, breaking the pole in the melee. His three-year-old grandson, Bob Neill, looks on admiringly.

H. M. Gresham
212 West Ferguson Street
Tyler, Texas



Editor:

I was born and reared in Marion, Guadalupe County, about seven miles south of the Comal County hill country. Until recently we hardly ever saw a deer in these small mesquite pastures, but last year we had quite a few here.

I think it's time to cut down on the deer population in some areas. Let's have fewer deer and bigger deer. If we keep only scrub bucks passed up by hunters and young bucks to breed to half-starved does, we will someday have deer about the size of a jack-rabbit. Maybe a bag limit of two does and one buck for several seasons in overpopulated ranges would help remedy this situation.

James H. Seiler
Route 1, Box 41
Marion, Texas

(Until a growing deer herd reaches the maximum size which its surrounding land can support adequately, we believe that only bucks should be harvested. Then both bucks and does should be hunted to limit the herd to the carrying capacity of the range. Deer herds would be healthier, does would produce more fawns to replace increased hunter kills, and animals would obtain greater size.—W. S. Jennings, Asst. Dir. Wildlife Restoration.)

Editor:

One morning about 2:30 while we were all-night fishing in the boat basin here in Rockport, a friend of ours, Wally Saunders, hooked something big. He borrowed our gaff and finally land-



ed a huge 36-pound redfish.

The fish was landed on a spinning rod and 8-pound test line!

The enclosed photo shows Saunders with his big fish and 33 trout my husband, Shorty Townsend, and I landed.

Mrs. May Linn Townsend
Box 258
Rockport, Texas

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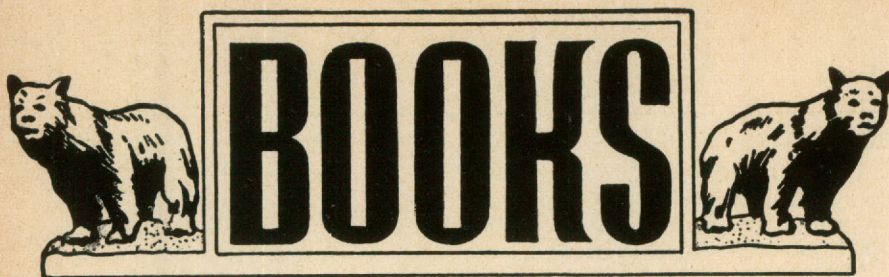
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BOOKS

YOUR PUPPY—How to Select, Raise, and Train Him by Leon F. Whitney, D.V.M. 192 pages illustrated with many excellent photographs of different species of dogs. Indexed for quick reference. Published 1955 by Country Life Press, Garden City, New York. \$2.95.

An excellent book for the potential puppy owner as well as the individual who has just purchased a pup. Actually the book should come before the puppy because it has a great deal of information on the selecting of a puppy, but it's worth the price if you only use it as a guide to raising and training your pup.

Included in Chapter One "How to buy a puppy," is a chart showing the relative traits and characteristics of the different species of dogs as well as a great deal of information on the relative costs of keeping each species.

Later chapters include practical advice covering every phase of puppy care including training, feeding, first aid, and the treatment of diseases.

The author of the book, Dr. Leon F. Whitney, is well known for his research at the Yale Medical School on cancer, genetics, and reproduction in animals. He has written many articles for leading scientific journals and na-

tional magazines as well as several other books on the proper care of dogs and cats.

BLUEFISHING by Henry Lyman. 96 pages illustrated with photos and drawings. Published 1955 by A. S. Barnes and Co., 232 Madison Ave., New York 16, N. Y. \$1.75.

The author, one of the East Coast's most skilled and learned anglers, writes as well as he fishes. The book accurately and clearly provides a detailed course in the art of fishing for this vicious game fish.

Texas Gulf Coast anglers might well discover new fishing thrills by following the methods outlined. The bluefish is somewhat neglected in the Gulf, although it is true that they do not occur in as great numbers as in the Atlantic.

SMALL GAME HUNTING by Francis E. Sell. 158 pages illustrated with photos of hunting and small game animals. Published 1955 by The Stackpole Co., Harrisburg, Pa. \$5.00.

If you are a hunter who is interested in examining how small game hunting improves big game hunting techniques and skills, you will find this book enlightening. Even the barefoot boy who goes out with rifle and dog

at heels after squirrels for dinner will enjoy reading the author's anecdotes written in the first person and covering such subjects as rabbit, raccoon, squirrel, deer, and woodchuck hunting.

Subject matter includes sections on field shooting and basic hunting. There are chapters of the book dealing with small-game hunting rifles, sights, handguns, and shotguns, directions concerning proper care and cleaning of them, and information about pertinent equipment.

WILDLIFE MANAGEMENT—Vols. I and II by Reuben Edwin Trippensee. Vol. I contains 479 plus x pages; Vol. II contains 572 plus xii pages; both moderately illustrated with photographs, drawings, and charts. Published (Vol. I, 1948; Vol. II, 1953) by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. Vol. I, \$6; Vol. II, \$7.50.

These books basically are textbooks, useful to technicians, students, or others interested in the study of game and fish, environment, and management. The author is professor of wildlife management at the University of Massachusetts.

Vol. I—Upland Game and General Principles.

Section headings of this book give a good idea concerning the contents and arrangement. They are Farm Wildlife, Forest Wildlife, Wilderness Wildlife, Miscellaneous Wildlife Relationships, and Wildlife Administration.

The importance of proper habitat is stressed throughout, and individual species are discussed by groups in relation to their habitat. The management of wildlife is tied closely to the management of habitat.

The section regarding miscellaneous relationships embraces such subjects as fluctuating wildlife populations and "cycles," predators, game production and harvest, refuges, and the critical factor of winter feeding.

Vol. II—Fur Bearers, Waterfowl, and Fish.

The conservation and management of water, swamps, and marshes is emphasized, since water is of such extreme importance to waterfowl and fish, as well as, in varying degrees, to many of the furbearers. Here, as in Vol. I, habitat and its management is stressed.

The orderly arrangement of this book adds to its usefulness. Each species of waterfowl is discussed under sections devoted to description, distribution, movements, courtship and breeding, and habitat. Sections for each furbearer are fur facts; geographical distribution; anatomy, life history, and ecology; and management. Fish sections for each species, generally, are description, distribution, age-size-growth, habits, habitat, physical and chemical limits, and game status.

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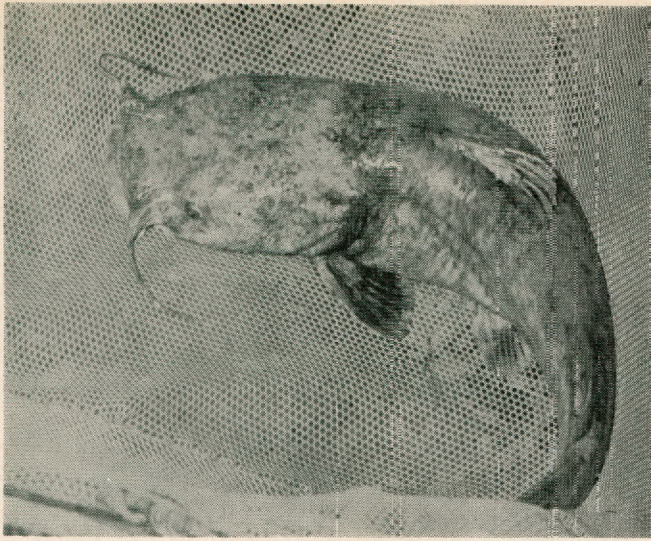
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Proud Papa . . .

This ten-pound flathead (or yellow) catfish is the proud papa of the unusual hatch produced at the Dundee State Hatchery.



. . . and Youngsters

This is how one half of the 20,000 young catfish looked at three days old. They are being transferred to a rearing pond.

Texas Flathead Catfish Produce Rare Hatch

The comparatively rare occurrence of a flathead or yellow catfish spawning in captivity was reported by Marion Toole, the Commission's Chief Aquatic Biologist.

He said the case is significant because flatheads, also known as Ocellous cats, are desirable for stocking the countless Texas farm ponds and tanks to reduce excessive populations of sunfish. Also, he added, flatheads become very large, even as much as one hundred pounds in weight, and are known for their food quality.

The Chief Aquatic Biologist said the latest flathead spawning was registered at the Dundee State Hatchery where H. W. Williams is superintendent. Only twice before had flatheads spawned in Texas hatcheries and then the production was limited to one hatch each.

Superintendent Williams has now paired up the male and female which

produced the precious hatch, in the hope that they will remain mated and continue to lay eggs every year. Some of the spawn has been forwarded to the laboratory at the San Marcos State Hatchery for studies and half of the remaining young flatheads were shared with the Possum Kingdom Hatchery for rearing.

State hatcheries over the years have produced channel cats without difficulty but the flatheads were in greater demand. Their predatorial qualities, needed to control the sunfish population, are accentuated by their voracious appetites and enormous size.

One problem in keeping catfish populations at proper levels in ponds and tanks centers around the lack of natural spawning places. Catfish prefer holes or depressions under the water. River currents provide such areas. Where there is little water

action, the necessary holes are not available.

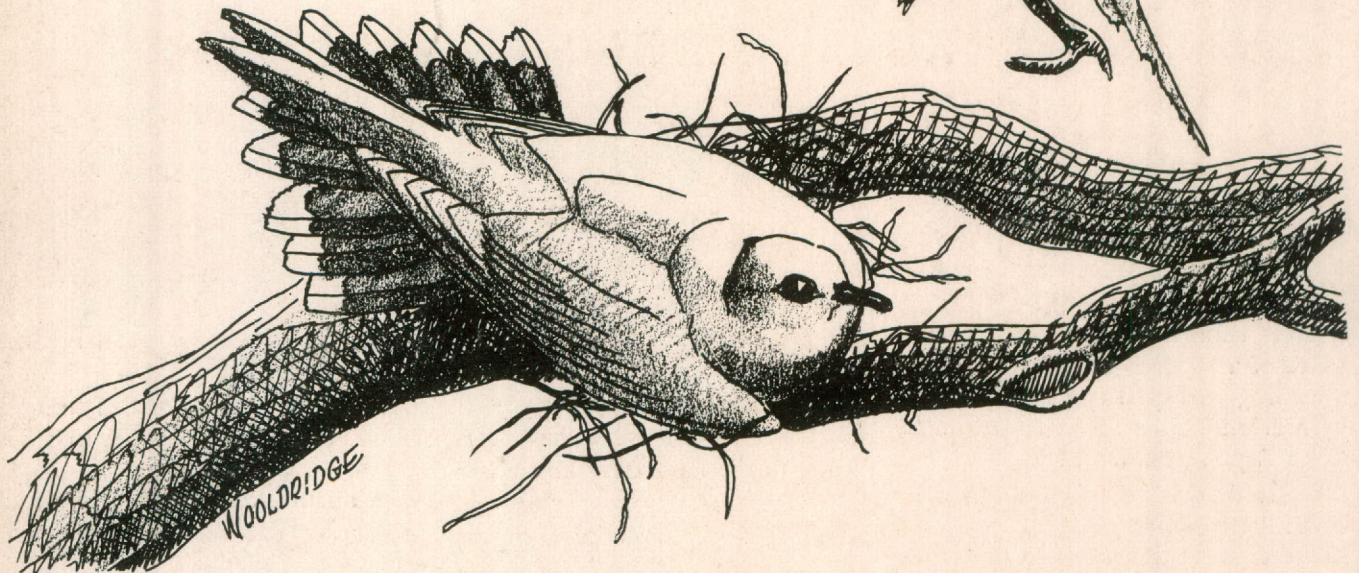
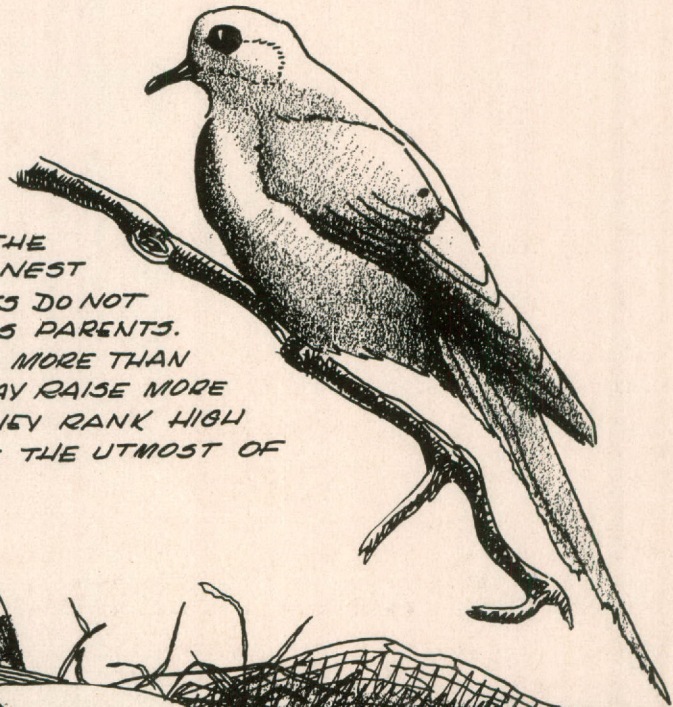
Superintendent Williams simulated a natural spawning area by using a large stone crock, slightly larger than an ordinary milk churn. This device is generally used for channel cat spawning. The parent flatheads weighed about ten pounds each.

One day Williams noticed the male on the "nest." Later he saw the female enter the jar and when she reappeared, the superintendent inspected the nest and found that the pair had spawned.

After the little flatheads hatched, they immediately distinguished themselves by their vigorous activity and hearty appetites. Williams said they were eating the standard menu of fine meat scraps while they had their small yoke sacs visible on the outside of their bodies. All of which bodes possible good for fishing round the state.—Jay Vessels.

NESTING DOVES

THE DOVE IS A MEMBER OF THE
PIGEON FAMILY THAT DOES NOT NEST
IN COLONIES. THEIR POOR NESTS DO NOT
COMPARE TO THEIR DEVOTION AS PARENTS.
THE NUMBER OF YOUNG SELDOM IS MORE THAN
TWO OR THREE BIRDS, BUT THEY MAY RAISE MORE
THAN ONE BROOD EACH YEAR. THEY RANK HIGH
AS A GAME BIRD AND DESERVE THE UTMOST OF
ASSISTANCE AND PROTECTION.



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