

Texas Game and Fish

APRIL

1955

TEN CENTS





The Road-Runner

The road-runner, or "chaparral cock" is long and slender, with a shaggy crest, long tail and strong legs for running. A member of the cuckoo family, the bird is more likely to run than to fly.

Their plumage is a streaked black and white. Road-runners eat insects, snakes and lizards, and occasionally bird eggs. Their song is a series of six to eight dove-like coos. (Staff photo by Clyde Graham.)

Texas Game and Fish



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

April, 1955

Vol. XIII, No. 4



In This Issue



Minnow Propagation	4
By MARION TOOLE	
Minnow raising, 'though risky, pays dividends. Here's how.	
Balance of Nature	10
By ROBERT A. McCABE	
Sometimes the attempts of man to "better" nature backfire!	
The Bald Eagle	11
By ALICE ROOT DRISCOLL	
Our national emblem is a native Texan.	
Hunters Harvest His Crop	12
By BOB BRISTER	
The story of a typical Hill Country "deer rancher."	
Let's Get Acquainted!	14
By ED H. FERGUSON, JR.	
Today's warden is much more than an enforcement officer.	
Fleshy Fruits Prove Attractive to Birds	17
By WILLIAM H. DAVIS	
Many East Texas natural plants lure birds.	
Fundamentals of Producing Fish	18
By DR. R. W. ESCHMEYER	
More fishing water is being created to take care of the demands of increased numbers of fishermen.	
Letters	2
'55 Duck Stamp Design Chosen	25
Texas Tracks	20
Disney Movies Now Available	30
Guns and Shooting	22
Worth Repeating	31
Free Bulletin Identifies Fish ..	23
Books	32

New 10 Commandments of Fishing.....Inside Back Cover

The Cover

The 4-foot-high great blue heron is at home on small streams, upland meadows, crop fields, and the shores of both fresh and salt bodies of water. In flight it folds back its neck and rests its head on its shoulders. The heron is a protected bird. This month's cover by Sidney A. Wooldridge.



Editor:

Here is the photographic evidence that railroad men sometimes slow down. W. L. Wilson of Fort Worth shown with the buck, has been a railroad man for 28 years, but he curbed the momentum long enough last fall to still hunt and bag this beautiful 18-point, 140-pounder.

Wilson, one of the finest sportsmen I know, got the prize on lands adjoining the Moore Plantation Wildlife Restoration area in Sabine County. Like other land around similar areas, it is populated by surplus game from the protected zone.

Charles Boyd
Wildlife Biologist
Hemphill, Texas

Denison Outdoor Show Adds Features

This year's Denison Sports Show, slated April 8 through April 11, will feature an extravagant 90-minute stage show in addition to the regular exhibits of hunting, fishing, and boating equipment.

An added attraction for the first time will be the Texas Game and Fish Commission's exhibit of live fish and game.

John Clift, who made the announcement, said there would be performances of the stage show each night, with matinees scheduled Saturday and Sunday afternoons. The show will feature Bill Carter, trick caster, and the Al Conner Troup, which boasts 43 trained animals.

Twenty-four exhibitors, including 14 national concerns, will have booths at the show, Clift said.

The show, to be held in the new High School Gymnasium, will open at 5 p. m. Friday, April 8.

Archer's Suggestion

Editor:

I am an archer, but I do not think a special bow season for deer, as outlined in a recent issue, is an absolute necessity. I think a practical plan could be worked out between the bow hunters and the landowners.

I have an idea that scattered over the state there must be quite a number of ranchers who do not allow deer hunting with scopes and long-range rifles, perhaps for conservation reasons or the safety of livestock. Yet these ranchers, if properly approached, might be glad to sell hunting leases to bow hunters with their primitive, short-range weapons and stealthy, unobtrusive method of hunting.

Such landowners might send in their names, general location of their property, and how they might be contacted and this information could be published in *Texas Game and Fish*. Deer hunting archers then could make contacts and arrange for permits or leases. This would necessitate no change in laws through action of the Legislature.

I am sure the bow hunters would cooperate to maintain the ultimate in rancher-hunter relations in a sincere effort to establish and perpetuate bow hunting in Texas.

Port Little
Box 52
Aransas Pass, Texas

(A bill providing for a ten-day special season for archers preceding the regular deer and turkey season was introduced in the House of Representatives. At press time it had received a favorable report from the House committee but had not reached a vote on the floor.)

(Whether or not this bill becomes law, Little's suggestions seem to have merit. Texas Game and Fish will be glad to print names of landowners willing to permit archers to hunt deer. However, we feel that archers and landowners could make contact much more satisfactorily through their own local newspapers or organizations.)

Hunter's Position?

(A. D. Thompson, Arlington, recently asked where a deer hunter would wind up in relation to his hunting camp if he left there at sunup and followed his shadow until sundown. Here is one answer.)

Editor:

I believe that the hunter would be seven miles and 559-plus yards from camp in a direction five degrees north-east.

I assume that a good hunter would travel about one and one-half miles per hour, that the sun makes a round circle of 25,000 miles in 24 hours, and that the sun rises at 7:30 at the start of the hunting season and sets at 5:30.

Since, like Thompson, I'm just sort of a "cowpuncher," I can't guarantee anything much. But I'll bet I can kill a buck with my .270 from that spot to the spot where the fellow would be.

A. H. Ray
Florence, Texas

Bugle Beat

Editor:

Hunters might be interested in knowing of a tradition of a friend and fellow hunter of mine, Bruno Schwab, 64, of Comal, near New Braunfels. He has been hunting for 40 years on and around the Franklin Schaefer ranch, which adjoins my lease on the Benno Schmidt ranch.

A few days after the deer season opened this year, my three hunting companions, Jean Kneuper, Ben Tolle, and Walter Mueller were surprised to hear a bugle blow a short taps, followed by three shots, then the blowing of full taps. So I told them the story behind it.

Schwab for years has carried an old World War I bugle, and he blows taps before and after shooting each deer. He also blows reveille the first morning in hunting camp to open the season, and it can be heard in hunting camps over a wide range.

He and his tradition have become widely known throughout the community, and we feel privileged to share it.

Jerome Fischer
1064 Comal Avenue
New Braunfels, Texas

Landowners Write

(Texas Game and Fish in the past has printed a number of letters from hunters who complained about the high cost of hunting leases. It seems only fair to present the landowners' side, too. So here are a couple of sample letters.)

Editor:

For some time I have put off writing this letter, for most of us are inclined to procrastinate even when we feel we should take some action. I have often wondered if the average city dweller actually knows the problems a farmer or rancher has because of the wildlife which lives on his property.

Sure, I know the first reaction. What if a varmint does get into the chicken house? He can easily be caught and killed. But what about that old doe that gets into the garden, trampling and destroying what she doesn't eat? And don't mention a deer fence. If they want to get in badly enough, no practical fence will keep them out.

Perhaps this is small enough damage, but what about twenty deer grazing all night on a seventeen-acre field?—grazing on barley, oats, or wheat that doesn't have enough root system to keep it from being pulled out?

Now we are getting to the big money end of it. For each one of those deer, if they were not present, we could keep one sheep. If we bought twenty sheep in September for six dollars a head, put them on the field until March, sheared them, and sold them again for six dollars, then the wool would be our profit. Sheep should average eight pounds of wool. At 60 cents a pound, that would mean the deer cost us \$96 for just seventeen acres, or about \$5.65 per acre every year on our cropland. Multiply that by 100 acres, and you begin to get an idea of what I mean. That doesn't figure the damage they did to the eventual crop of grain by pulling out the small plants.

But we are not farmers, alone. We have altogether 856 acres, about 100 acres of it cropland. We lose money every year to the deer, but we get SOME of it back by leasing our pasture for hunting. We charge roughly \$200 for three men and their wives. For the last few years we have had around six bucks killed every year. The kill could have been larger every year, but we are glad that it wasn't. We like to see a few legal bucks still around when the season closes, and we have had them.

Some time ago there was an article in one of the big daily papers. The writer objected to the charge of a fee to shoot "state-owned deer." I suppose he felt he should get to shoot them for the price of his hunting license.

Perhaps he also thinks the state should pay the farmer for crop damage done by "state-owned" deer. I don't think this way. I think the cost of feeding deer should be shared jointly by the hunter and the landowner, those who get the most satisfaction

from having deer.

Our present system perhaps is the best way to accomplish this, although, as in everything, it is not perfect.

Despite the trouble deer cause landowners, I don't believe they should be destroyed. But some people need to realize that deer have to eat to live and what they eat takes something away from someone else.

The deer are part of our great nation. Let's keep them. But I hope hunters will try to remember that they are helping to defray part of the deer's upkeep next time they are asked to pay for hunting privileges.

Mrs. Egon E. Wiedenfeld
Comfort, Texas

Editor:

I have given a great deal of thought to the protection of game, particularly from the side of the small landowner, for I am one of them.

Among small country landowners, the city hunter gets most of the "cussin'" and, because of the actions of many of them, probably are due their share. But they are not nearly as destructive as the sneak poacher who is your neighbor down the road. He is in a position to check your movements, and when you have to leave home, he swarms all over your place, killing your game without regard to game laws, your personal rights, or even human decency.

We have trespass laws, sure, but about all posting does on a small place is to keep decent hunters out and provide better hunting for your poaching neighbor.

The point I'd like to make is that we need more wardens. I noted a letter in the December issue urging more wardens, and I certainly agree this would be of great help to the small landowners who harbor most of the game.

To help finance it, I think the law should require every hunter to buy a license, even if he hunts in his home county. After all, the local hunter is the one who takes the greatest amount of game in a given area. This might add another warden to each county.

Another law that would be of great help would be one requiring hunters to get daily hunting permits from landowners. This one also would be particularly helpful to the small landowner seeking to protect game from the poaching of local hunters, for the warden would have something solid on which to base charges. And why should any valid hunter object to going to the trouble of obtaining a written permit if the land is worth hunting on?

E. A. Logan
Route 2
Dike, Texas

Salesman

Editor:

I have subscribed to TEXAS GAME AND FISH from the very beginning of the publication, and I believe I can conservatively say that I am the cause of your having at least 100 of your subscribers over the years. The comment I hear from your readers which is, I believe, one of the reasons your magazine is so successful, is the fact that practically 100 per cent of your articles deal with Texas, rather than with nationwide or even worldwide localities, as is the case in most sportsmen's magazines.

We have always had a very fine game department over the years, and I believe you are doing an outstanding job today in all departments and I, like many others, appreciate your fine work.

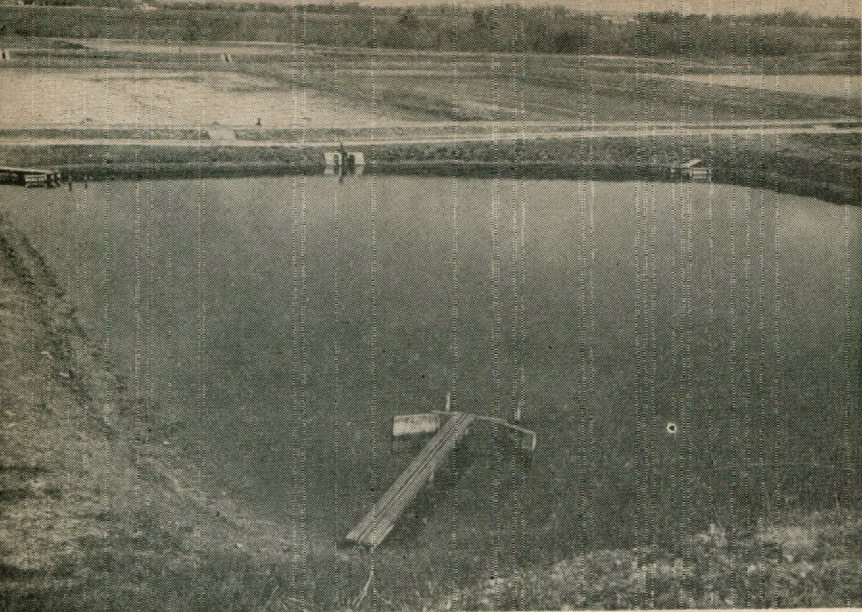
H. T. Hibler
Perry-Brooks Building
Austin, Texas



Editor:

Enclosed is a photo of three jewfish caught in three hours by Chester Martin, Weslaco, and Jack Porter, Mercedes. They weigh 354, 304, and 44 pounds. Porter fishes at Port Isabel and has caught 12 such fish this year. Although these three are not of record size, it isn't a bad catch for three hours of fishing!

Austin Webb
Box 88
McAllen, Texas



A section of ponds in the San Marcos state hatchery that are ideal for producing minnows. Note a drain ditch separates the two rows of ponds and that the levee on either side of the drain ditch is used for roads. The depth of water at the drain box is six feet in the filled pond in foreground.

Minnow

By **MARION TOOLE**
Director of Inland Fisheries

THE GAME and Fish Commission has not issued a bulletin on this subject but this article will answer some of the many questions received by the Commission daily which ask about the propagation of minnows.

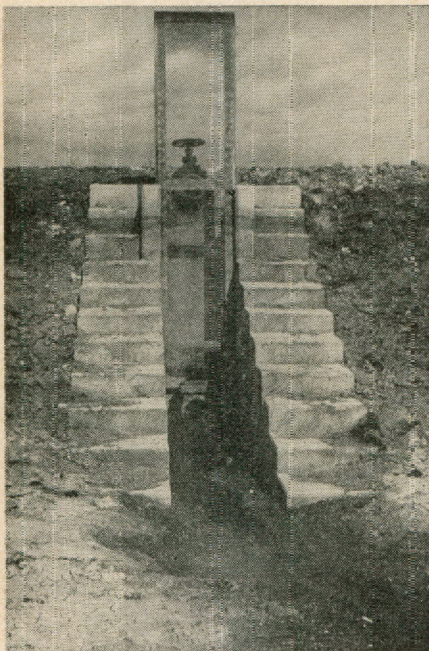
EXPECTATIONS

Contrary to some accounts that hundreds of thousands of minnows can be produced in a very small pond, the majority of minnow raisers have found that smaller amounts of production can be expected. With extraordinary luck, an acre pond may produce as many as 100,000 minnows but about 80,000 minnows per acre would be an excellent average production.

Of grave importance is the fact that your desire to hatch and produce minnows means that you are probably entering a new field of endeavor that is entirely different from anything you have ever done. Minnow raising does not mean just placing minnows in some water and then reaping the harvest. Fish culture has developed into a science over the centuries and still our hatchery personnel, although trained for many years in that science, are encountering new problems daily that must be solved in order to more successfully raise fish.

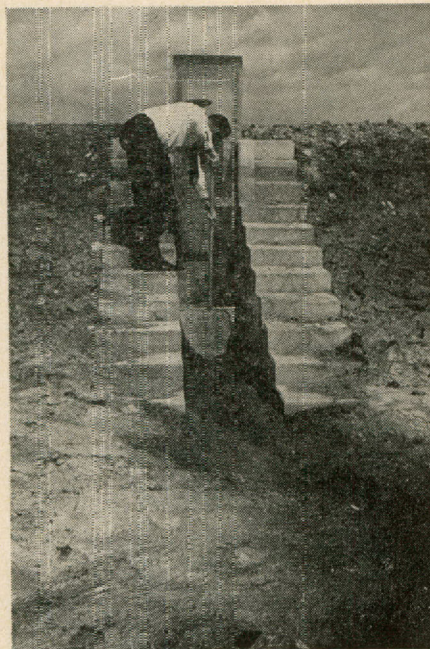
It must be remembered that you will be dealing with living animals or livestock that are heir to many diseases and attacks from parasites. These animals must live in another world, the aquatic world, and you must learn how that environment functions.

It takes study, time and experi-



A pond drain box is poured with screen slots left on either side of the box so a screen covered with fine hardware cloth can be dropped in the box and will keep the minnows from the drain. The screen is shown lifted up from the drain box bottom where it should be, in order to show the screen to better advantage.

A pond drain box like this is highly recommended for minnow culture: water inlet valve is located on the top of the drain box and the drain valve is in the bottom of the drain box. The drain valve is the lowest spot in the pond.



Minnows can be easily removed from the draining pond when the water is drawn down to about a three foot depth, by the use of a long-handled dip net as shown. The net is inserted in the drain box opening at the mouth and is then pulled to the screen and lifted out. The minnows could then be placed in a container sitting on the opposite steps. It is possible to remove all but a very few minnows before all the water is run from the pond by the use of this technique and golden shiners may be handled during the summer in this manner without any injury.

Propagation

Staff Photos by
Clyde Graham

ence to learn the many facets of fish culture. Consequently when you make up your mind to go into the minnow culture business you should expect some failures and setbacks at the start, but if you stay with the business you will find that the failures become less frequent as your experience increases.

SOME AVAILABLE LITERATURE

Some excellent publications on the subject have been received by the Commission and are herewith listed for your information:

1. *Propagation of Minnows and Other Bait Species*, by Dobie, Meehan and Washburn; Circular 12 (1949) for sale by the Superintendent of Documents, Washington 25, D. C. for 35 cents.
2. *Production of Bait Minnows in the Southeast*, by Prather, Fielding, Johnson and Swingle; Circular No. 112 (1953), Alabama Polytechnic Institute, Auburn, Alabama. No charge mentioned in bulletin.
3. *Production and Harvest of Bait Fishes in Michigan*, by Hedges and Ball (1953); Institute for Fisheries Research, Ann Arbor, Michigan. (Miscellaneous Publication No. 6.) No charge mentioned in bulletin.

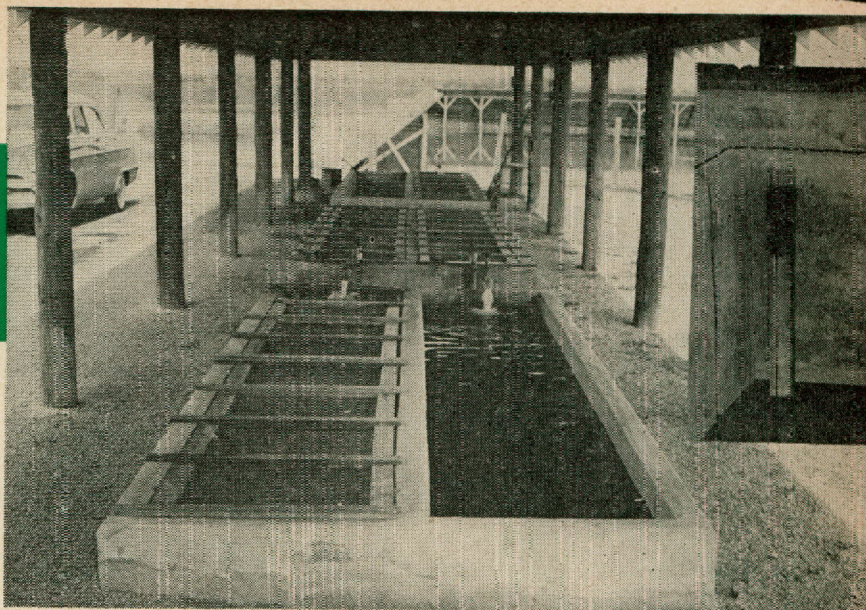
POND CONSTRUCTION

Ponds must be constructed with earthen levees and bottoms. A drain box must be provided and the pond bottom should be shaped in such a manner as to drain all water into the drain box. The depth of water at the drain box should be at least four

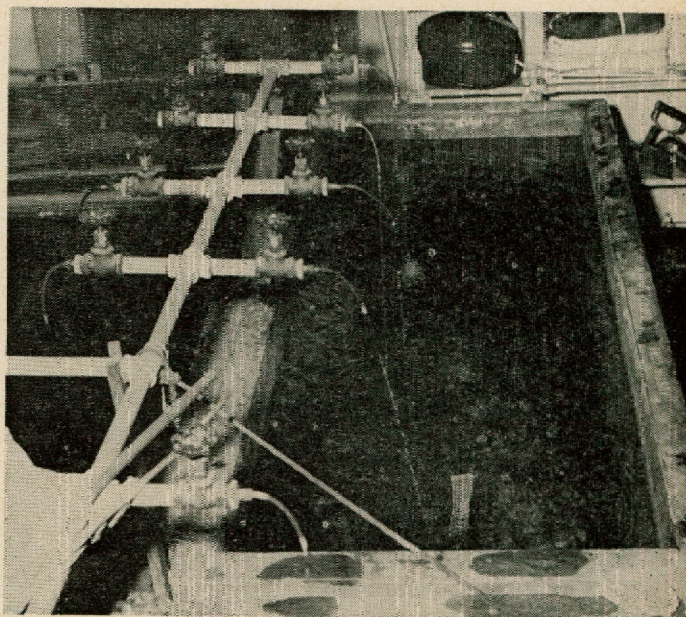
feet. Levees should be built with a 3:1 slope on the water side. Levee crowns should be five feet unless the levee is to be driven on. In such a case, the crown should be twelve feet wide.

Each pond must be provided with a separate water intake and outlet. (See illustration.) Originally, the state hatcheries introduced water into the back end of ponds opposite to the drain box. This design was found undesirable due to the fact that water introduced into the pond would carry mud into the drain box

and it was also discovered that while draining a pond, the pond water sometimes became warm and devoid of oxygen and that fresh water run into the pond in order to add oxygen and cool the water would draw the fish away from the drain box. By introducing the water from the top of the drain box into the pond an opposite effect would be achieved, fish that were being taken from the pond would then come into the drain box where they could be dipped out with ease rather than

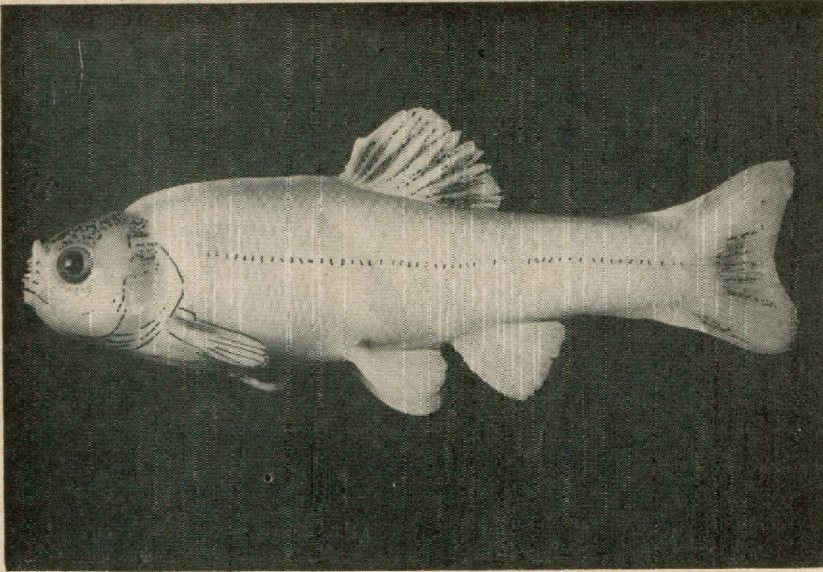


Hatchery holding troughs that are ideal for holding minnows. Water is brought in at one end and flows out the opposite end. The depth of the water in the trough can be regulated by the height of the overflow pipe shown in the inset. Note that troughs have screen covers and the drainpipe also has a screen cover to prevent loss of minnows.



Holding troughs in a bait dealer's place of business, showing another method of running water into the trough in order to obtain aeration of the water.

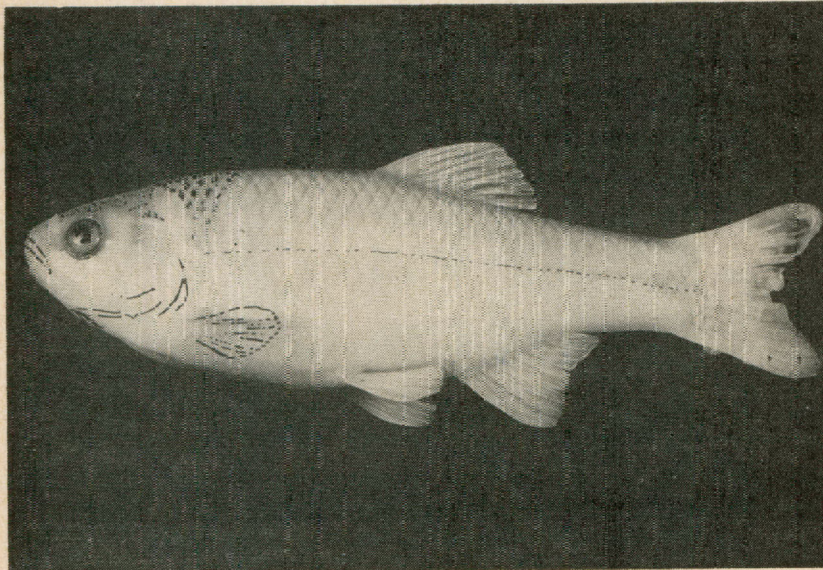
TEXAS BROOD MINNOWS



Blackhead or Fathead

Pimephales promelas

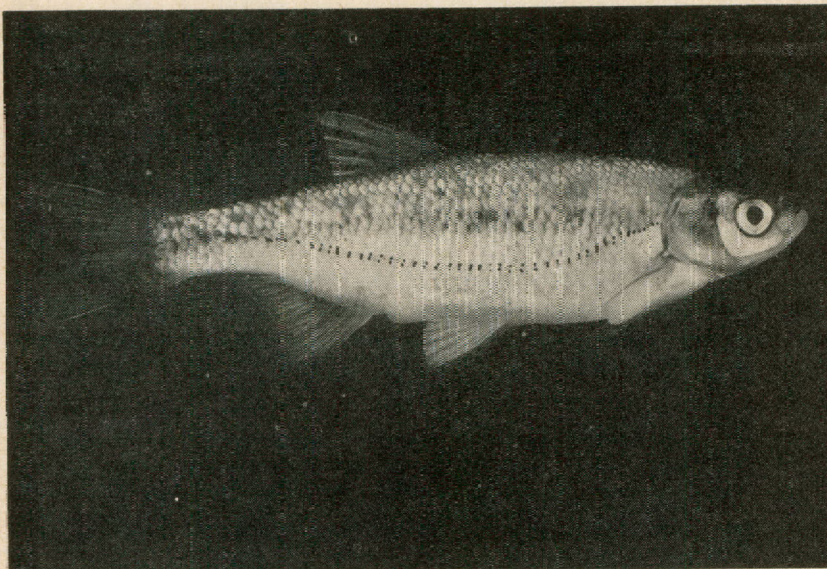
Blackhead or Fathead Minnow, *Pimephales promelas*, is a very prolific pond spawning minnow, but is not too desirable as a bait minnow. These minnows nevertheless are sold in huge quantities by bait dealers. The fish shown is a male.



Red Horse or Redfin

Notropis lutrensis

Red Horse or Redfin Minnow, *Notropis lutrensis*, is a good pond spawner and is also a desirable bait minnow. The males, such as the fish shown, are highly colored during spawning season. Many anglers call the females silversides. Due to their prolific propagation it is extremely hard to get these minnows to attain a sufficient size for a bait minnow. A dark purple V shaped saddle can always be seen just behind their head.



Golden Shiner

Notemigonus crysoleucas

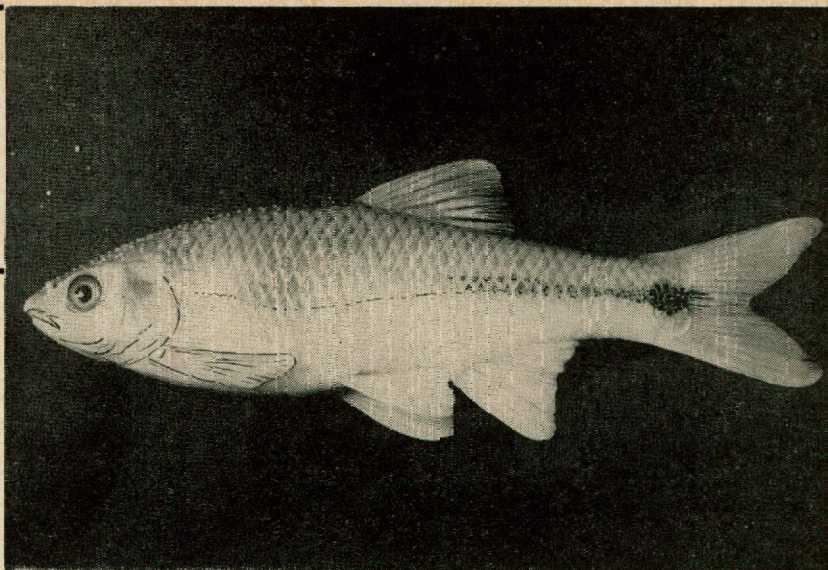
Golden Shiner, *Notemigonus crysoleucas*, is a very desirable minnow for taking black bass. Note the deeply recurved lateral line. An excellent pond spawner.

Shown here are six species of minnows commonly sold for bait in Texas. Four are natives, two are exotics.

Texas Blacktail or Spottail Shiner, *Notropis venustus*, is one of the choice bait minnows. Unfortunately, this minnow is a stream spawning minnow that doesn't propagate in ponds. Many of the male minnows of the various species develop spawning tubercles on their backs and heads during spawning season. Such tubercles are excellently shown on this male blacktail shiner.

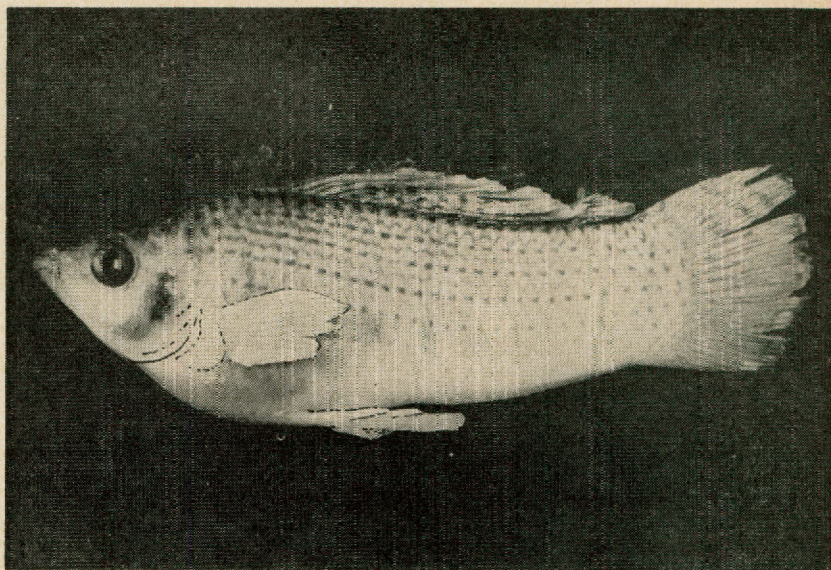
Sailfin Molly, *Mollienesia latipinna*, is an example of one of the exotic minnows that is being sold in the bait industry. This is a tropical fish that can't survive if the water temperature drops below about 45° F. for any length of time. These minnows are viviparous, the young being born alive. The depicted minnow is a male. They don't rate too well as bait minnows. These minnows will propagate in ponds if warm water is available in winter.

Rio Grande Tetra, *Astyanax fasciatus mexicanus*, is an exotic fish that is a most excellent bait minnow. They are now being sold in large quantities in Texas and bordering states. They are a tropical fish that can't live in water under 45° F. for any length of time. These minnows will spawn in ponds, but warm water is essential during the winter months.



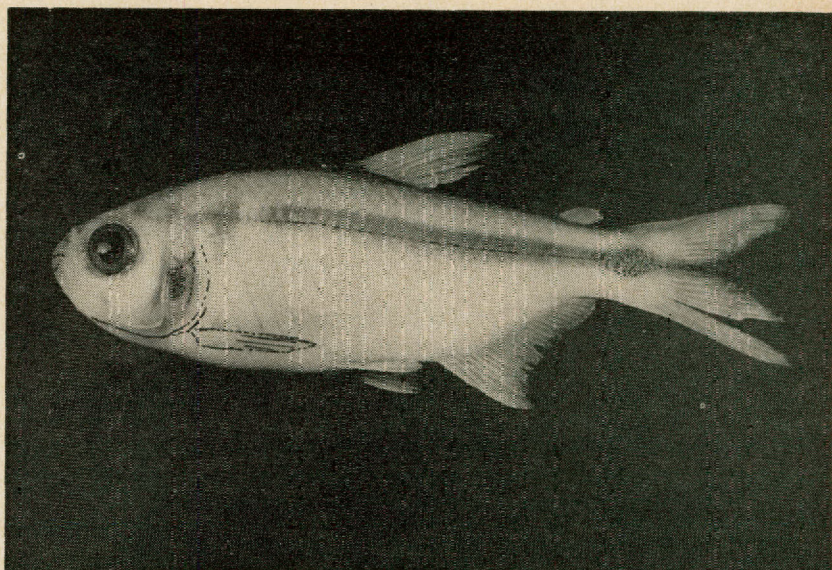
Texas Blacktail or Spottail Shiner

Notropis venustus



Sailfin Molly

Mollienesia latipinna



Rio Grande Tetra

Astyanax fasciatus mexicanus

drawn away from the drain box.

The size of the pond should be at least one-half surface acre in size and preferably one surface acre in order to achieve a higher yield of minnows. It has been our experience that a one-half acre pond will produce more minnows than two one-quarter acre ponds will.

WATER SUPPLY

The water supply is a most important item. Water that is introduced into the pond should be devoid of any type of fishes. Well water or spring water not too heav-

ily mineralized is excellent provided no fish are permitted to reach the source, so they can be introduced into your pond when water is added. If water from a lake or stream is used, some form of sand and gravel filter should be provided because screening of a practical nature will not remove all fishes.

BROOD STOCK AND SPAWNING

Some minnows spawn in still water as provided by a pond and other minnows spawn in running water as provided by a stream, river

or creek.

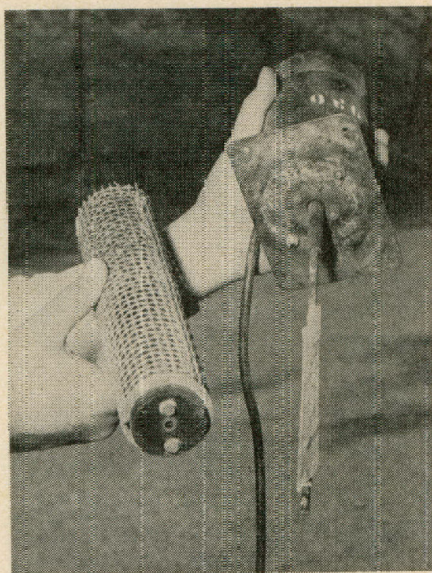
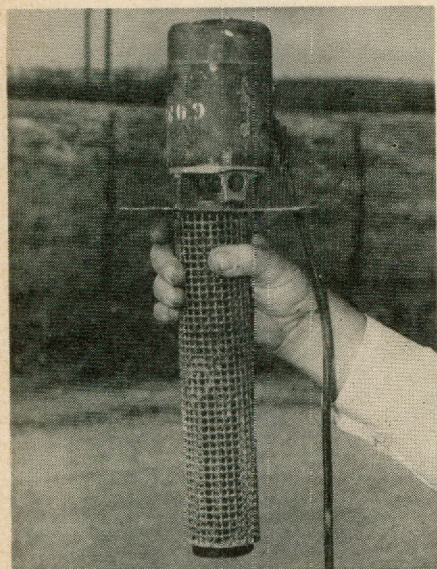
Some of the pond spawning minnows or fishes are the golden shiner, *Notemigonus crysoleucas*; redhorse, *Notropis lutrenis*; blackhead or fathead minnow, *Pimephales promelas*; and goldfish, *Carassius auratus*.

Two examples of stream spawners are the spottail shiner, *Notropis venustus* and the stoneroller, *Camptotoma anomalum*.

Some of the Commission's hatchery system raise golden shiner minnows that are used as forage fish for raising black bass to be used as brood fish. As a result this is primarily the only minnow we are familiar with. About 200 adult shiners are stocked in an acre pond in February or March. Offspring from these fish are dipped from the pond during the summer and are fed to the black bass. While no accurate records have been kept, approximately 80,000 minnows are present when the ponds are drained in the fall. The San Marcos Hatchery tried blackhead or fathead minnows in a one-eighth acre pond and received between 50,000 or 60,000 minnows at the fall draining. Between 500 to 2,000 adults per acre will give a good production.

Golden shiners start spawning in March in shallow water ponds and continue spawning all summer until October. They spawn on submerged aquatic plants, filamentous algae and in many of our hatchery ponds that have Bermuda grass planted on the levees. They use the Bermuda grass runners that grow into the water for depositing their eggs.

Blackhead or fathead minnows will also start spawning in March, probably a week or so earlier than golden shiners, and will also spawn all summer and into early fall. These minnows always deposit their eggs on the underneath surface of rocks, logs or similar objects so some type of spawning aids should be installed in their breeding ponds. Wood or slate shingles can be stuck into the levee banks a foot or so under the pond surface or two stakes can be driven into the pond bottom so their tops are about six or nine inches above the bottom. Then a 1 x 4 inch board, six or eight feet long, can be nailed to the



Two views of the 6 volt electric agitators showing the agitator with the stirrer covered, above left, and uncovered, above right. Note stirrer is connected to the motor shaft by the use of rubber tubing which acts as a universal joint and prevents injury to the motor shaft should the stirrer be out of line and also that the brass stirrer shaft is held at the other end by a heavy hard rubber plate which makes a perfect bearing as long as the agitator is always run in water.

Below are the fish delivery tanks used by all of the state hatcheries. Aeration is furnished by the two agitators inserted in the box top. Minnows may be hauled in separate screen boxes, two of which are shown in tank, or all together in the large tank by removing the screen boxes. Assistant Hatchery Supt. Roy Edmiston is looking in box.



stakes. Always have the flat side horizontal to the pond bottom. It is recommended that these two species be the ones tried because it is our belief that they will prove the most successful minnows to raise.

FOOD

For years our hatchery personnel has been feeding meat meal or meat scraps to our young channel catfish. When some of the personnel started raising minnows they fed the same food to the minnows with excellent results. The meat meal or meat scraps are specified as follows in Circular No. 115, entitled, *The Texas Feed Law*, by F. D. Brock, Chief Feed Control Service: "50% Protein meat and bone meal shall have crude protein not less than 50%, crude fat not less than 6% and crude fiber not more than 3%."

The amount to be fed should be judged by experimentation. Feed until minnows stop eating it at a feeding. The feeding should be at the same time each day. For a pond of minnows in a hatchery, usually 600 pounds per year are fed.

The uneaten food will prove to be a fair fertilizer.

TAKING MINNOWS FROM POND

Minnows can be taken from the ponds by draining, seining, use of an umbrella net or by the use of glass jar minnow traps.

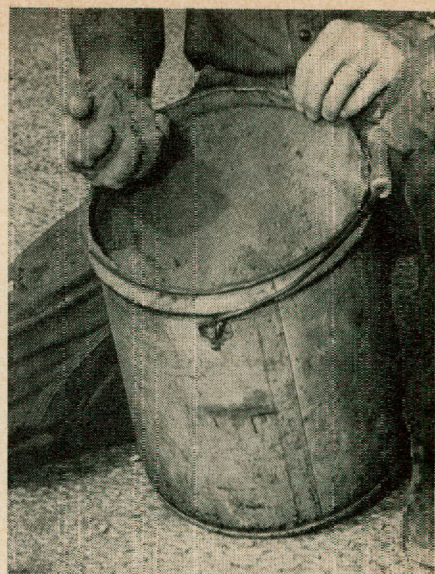
In draining a pond, if a drain box patterned after the style in the accompanying photograph is present, a screen as shown is set in the drain box and then the drain valve opened. The valve should be completely opened at the onset and kept that way until the water is about three feet deep in the drain box. The valve is then partly closed in order to bring the minnows into the drain box. The minnows will not enter the drain box if the water is running too fast or too slow. If a happy medium is hit they will enter the box in large numbers. A long-handled dip net is used for dipping the drain box. This net should be constructed so it will just clear the two side walls of the drain box and should be about three feet deep.

It can be made from a reinforcing rod attached to a long handle and covered with Bobbinetting of about 1/16" mesh. Nylon material will outlast cotton material. The bottom of the net is placed at the entrance of the drain box and drawn through the water until the bottom of the net contacts the drain box screen. The net is then lifted up and the minnows placed in a container. If golden shiners are being handled, a clear plastic or glass container will be found to be desirable because golden shiners are bad about jumping. They apparently jump for light so their jumping can be stopped by placing them in the clear containers. By following this procedure practically all the minnows can be removed from a pond before all the water runs out.

If submerged vegetation is present in the pond it should be raked into windrows, as the water recedes in the pond, to keep the minnows from being trapped by the vegetation. After vegetation is exposed to the air it should not be again covered by adding water to the pond until all the minnows have been taken from the pond, nor should minnows be placed in a freshly drained pond where such vegetation has again been covered. Many minnows and fish have been killed by hatchery operators when this was done.

Should raking vegetation become too arduous, a chemical can be used several weeks before the pond is to be drained. The best chemical to use is sodium arsenite. Sodium arsenite can be purchased from chemical companies and large seed stores. Its trade name is "Sodium Arsenite Weed Killer." The commercial weed killer must contain four pounds of arsenous oxide per gallon. One gallon of weed killer added to 64,082 cubic feet of water will make a mixture containing one part per million of arsenous oxide. Never make the maximum dose for treating your pond over eight parts per million.

As an example, suppose that after carefully computing the volume of water in your pond you find that your pond contains 10,000 cubic feet of water. You wish to give the pond a treatment that will amount



Powdered meat scraps as fed to minnows.

to seven parts per million concentration, so divide the 10,000 by 64,082 and you will obtain the amount in gallons of weed killer necessary to give you 1.0 parts per million concentration. This would amount to 0.15 gallon. Then by multiplying that amount by 7 you obtain 1.05 gallons or slightly over one gallon, which is the amount of weed killer you must apply to obtain a seven parts per million concentration in your water.

When bought, this weed killer is sold in a thick, heavy state so it should be diluted one-half with pond water. The best way to apply the weed killer is by spraying it over the pond surface with pressure sprayer. Treatments should only be made in warm weather since the chemical spreads through the water more quickly when the water is warm. It might be necessary to give your pond several treatments of sodium arsenite to kill out the vegetation.

This substance is extremely caustic so you should be very careful to keep it off your clothes and body.

It has been found that livestock can drink water treated with this substance, provided that the arsenic content does not exceed twelve parts per million. Ordinarily, most vegetation can be killed when a six parts per million treatment is used. It should be pointed out, however,

• Continued on page 26



BALANCE of NATURE

By **ROBERT A. McCABE**
University of Wisconsin

Here are three tales of how hunting and fishing were ruined when Man tampered with Nature

Fishing Ruined by 'Improvement'

In northern Wisconsin there is a small, clear-water lake, the shores of which are owned by one man, thus making the lake "his." Although he owns other lakeshore property nearby, this has been his favorite spot. Half the lake to the south is walled in by a virgin stand of pine. In bygone days long green shadows cast on the surface of northern lakes by virgin timber were commonplace; today such shadows are rare. Fire and axe fortuitously by-passed these pines and this lake and thus made them one of the few remaining reckoning points for evaluating outdoor beauty. The soft mat on the forest floor has in times past cushioned stealthy moccasins as it now cushions the fall of factory shoes. The pine woods aroma that inundates the trunks of these big trees is that which soaps and shaving lotions mimic. The high pitched "tzip" or "zee" of wood warblers

AT a drift fence on the range in central Texas, three riders dismount. The last one out of the stirrups runs his gnarled fingers up and down the small of his back and moves slowly toward the fence. Each man scans the range. Grandfather spits tobacco juice on the sodless

filters down from the forest crown as a pleasing overtone of the wind soughing through lofty pine boughs. Here, too, is the weightless substance of wilderness—solitude.

The upper end of a black spruce-tamarack log looks out onto the

• Continued on Page 24

ground; the father pushes his Stetson to the back of his head, and with elbow on a fence post cradles his chin between thumb and hooked index finger. The son's eager eyes flash from the moving herd in the distance to the troubled faces of his forbears. Each views the same scene, but the comfort and satisfaction derived from what he sees is *indirectly* proportional to the age of the viewer. Why?

Grandfather knows that when he first looked at the then fenceless range, the longhorns were able to eat the same grass that shaded their beds. The fact that cattle had to stand to see over this feather bed of forage was ample evidence that it would fatten a larger herd. In

• Continued on Page 24

When Predators Died, So Did Deer

Part of the Kaibab National Forest in northwestern Arizona is a plateau of about 725,000 acres. Here Indians, deer, wolves, coyotes and mountain lions lived in harmony with the plants and smaller animals of this wild and rugged wilderness long before the crack of a white man's rifle echoed between the rimrocks. In the exploration of the West, wagon trains followed the fur traders and frontiersmen; railroads followed the wagon trains; and cattle

followed the railroads. This linear build-up of the overrated social pattern called civilization brought with it the professional wolf trapper.

The buffalo, bread and butter of the western wolf, was taken from him by the wanton hide and tongue trade. Of the more than a hundred million bison that once roamed America's grasslands, all but a few small herds became a memory in one generation. Even before the

• Continued on page 25

Our National Emblem Is A Native Texan

Surprisingly, Benjamin Franklin did not want the bald eagle to be chosen as our national emblem. He thought the wild turkey was a more suitable choice and pointed out that the bald eagle was a bold robber, stealing from the osprey, or fish hawk, whenever possible. Nevertheless, after much controversy, the bald (or American) eagle was chosen by the Second Continental Congress in 1782 and has reigned supreme as our national emblem ever since. Watch a bald eagle cruising through the air, strong and majestic in flight, with a wingspread that may measure seven and one-half feet, and you see the proof of a wise choice.

Appropriately enough, this eagle is a true native of America. Although there are eagles in almost every part of the globe, the bald eagle can be found only in North America. His immediate habitat is near the larger bodies of water; and although he has been observed around our rivers in south-central and southwestern Texas, he prefers the much wilder regions about the Gulf Coast for his abode in Texas.

He is called the "bald" eagle because of the white feathers on his head, not because of the absence of feathers. During earlier times, "bald" meant white or streaked with white. A horse

● Continued on page 23

The

BALD

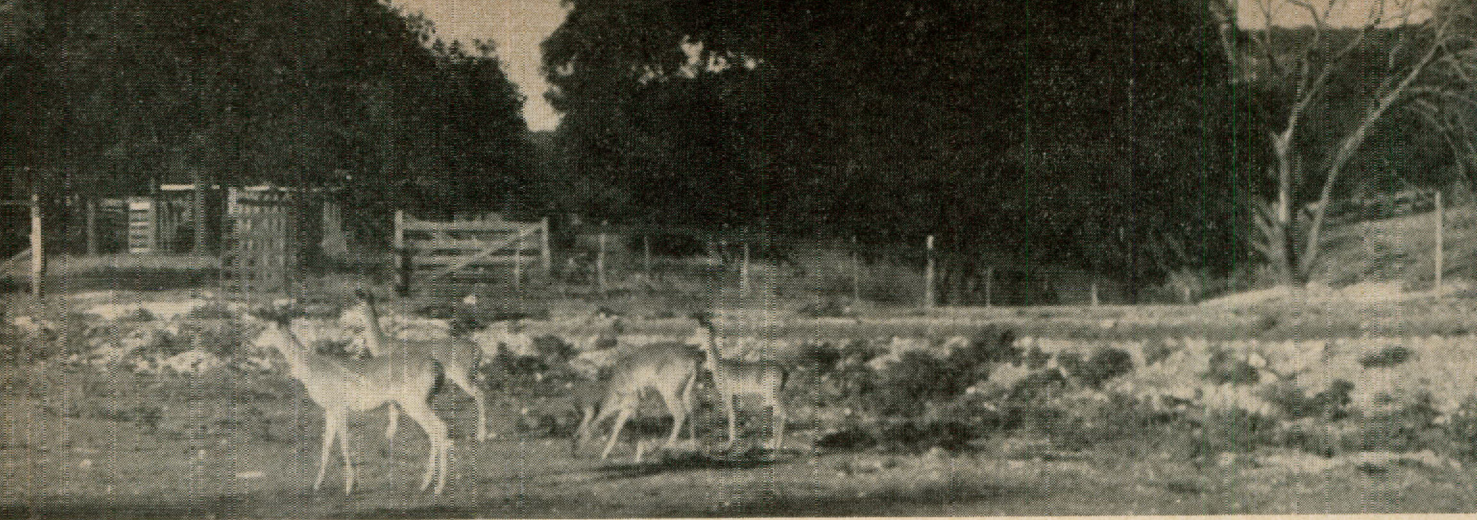
EAGLE

By ALICE ROOT DRISCOLL

The bald eagle and its nest both are spectacular



Charles A. Proctor from National Audubon Society



Wild deer, three little bucks and a doe, stand in R. L. Sabins' yard waiting to be fed. They come up every afternoon, like cattle, but are suspicious of strangers.

HUNTERS

Harvest His CROP

A quarter century ago, deer hunting appeared on the way out in Texas. Ranchers like R. L. Sabins can take much credit for the rebirth and steady revival of Texas deer herds.

By Bob Brister

Reprinted courtesy Houston Chronicle Magazine



An 8-year-old doe, eats out of Sabins' hand and follows him like a puppy.

THE little band of deer trotted out of the shadows and into the golden strip of late-afternoon sunshine spilling over the rim of the canyon. They stopped in the clearing, raised their ears in our direction only casually, then placidly began grazing at the edge of an oat patch.

Bob Sabins handed the binoculars to me.

"See that little eight-pointer over next to the brush," he grinned. "Watch him. He's a new one to this bunch, and one of those other bucks will challenge him in a minute."

It wasn't even that long until the new buck got too close to the herd, and a husky 10-pointer made a menacing run at him.

"You know every deer in these hills by its first name?" I asked him incredulously. "How'd you know he was going to do that?"

Sabins shrugged and we walked back into the yard. We'd seen the show from his back yard fence on a ranch about four miles from the business district of Kerrville.

From where we sat in the shade talking, we could see two separate groups of deer in the clearing, and there was another bunch feeding in the "front yard."

R. L. Sabins, fortunately for his deer, represents a new and progressive group of Hill Country ranchers who are learning that deer are a vital economic crop to the area . . . and they're being treated accordingly.

Feeding deer through the rough times of the year is nothing new. But managing them like a herd of cattle is a far cry from the old-time policy of shooting every buck available during the legal season.

Sabins, however, is quick to tell you he's a newcomer to the game and certainly not bragging about any accomplishments on his small ranch. He says he just happens to like to fool with the deer, and that's why he started in the first place. That, and the fact that otherwise the hunting would all be gone by now.

A former Houston contractor, he went to the Hill Country because of ailing sinus eight years ago. Now he says the ailment was the luckiest a man ever had as far as he is concerned.

He lives in a sort of a sportsman's Utopia, with a

couple of good bass ponds in his front yard, ducks on a pond in the back pasture, turkey that keep his feeders cleaned out worse than chickens, and, what we were seeing, deer all over the place.

"I decided a long time ago," he explained, "that I could make about as much out of my deer by carefully managing them as I could out of the number of sheep and goats that I might have in competition with them. And deer are a lot more fun to raise."

As we sat and talked, the band of deer in the front yard kept moving closer. It was about time for their supper.

"It's a long story," Sabins was saying, "but I'll boil it down by explaining that this country gets pretty rough on any kind of wildlife when we have a bad drouth or a long spell of bad weather. So much of this range produces plants that deer and goats both use, that the two animals are often in competition for survival. So I take care of both of mine."

We went out to the barn and I watched him measure out a portion of shelled corn, a little maize, and some hay. Then we drove out in the pickup truck and seven wild deer came up and almost ate out of his hand. One of them actually did that, but she is the family pet and wears a bell to show for it.

If it had been a little drier, or colder, we probably could have fed deer at a half dozen spots over the 800 acres in this part of the ranch.

Sabins represents a trend that is becoming increasingly apparent in the Hill Country. He's raising the animals as a cash crop, and employing sound management practices to ward off the encroachment of drouth, changing habitat, and a lot of other conflicting factors.

Scattered at choice locations over the ranch are deer feeders that stay full of grain most of the "lean months." Whenever nature lends a hand, however, Sabins takes advantage of any betterment in forage feed.

Stomach worms are a hazard of wild game and domestic stock alike. Domestic stock can be rounded up and "drenched" as a preventive measure. It's not that easy with the deer.

Sabins found out about a certain kind of stock salt now on the market which also contains the worm medicine. He bought some, expensive though it is, and eliminated another hazard to his herds.

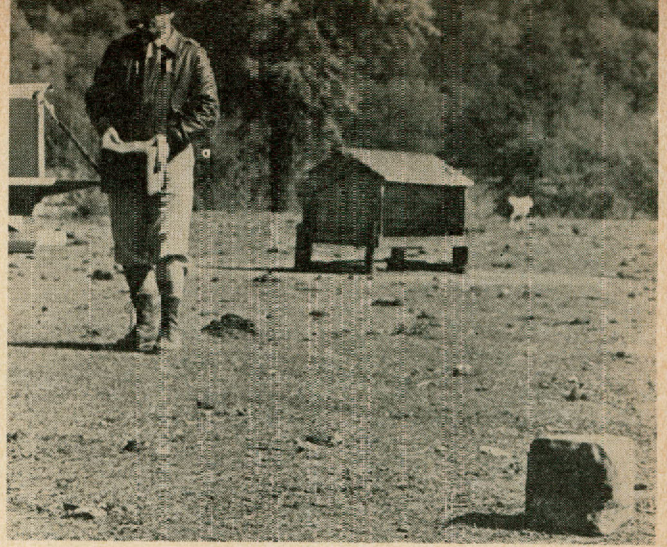
Each year, off only 800 acres, Sabins is growing a crop of deer which are bigger, fatter, and more numerous than the herds on some nearby ranches of three times that acreage.

Each year a portion of that crop is harvested. The rancher leases to 12 hunters each season. He allows them one buck each, and one turkey. They are certain to get that, as he makes sure that they do.

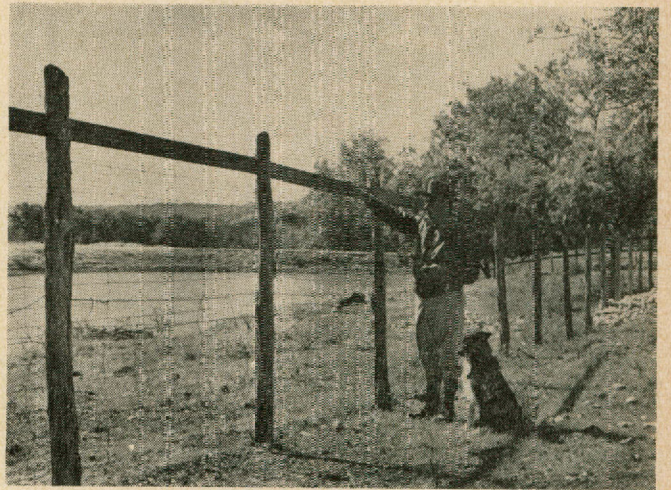
Comfortable blinds are set up at the spots he wants hunted. But some areas of the ranch are not allowed to be hunted at all. That is where the "big bucks" stay.

"If you were raising cattle, you wouldn't kill off your best bulls every year and let the culls and yearlings do your breeding, would you?" he asked. "Well, that's what's been happening to Hill Country deer for years,

• Continued on page 24



Medicinal salt gives the deer the additional salt and other minerals they need as well as medicine which helps prevent worms. It's the only way such medication can be administered.



A deerproof fence keeps the herds separated as the rancher desires. He shuts off a field until it is needed for grazing, then opens the gates and makes it available to the deer.



This turkey feeder is designed to keep the wary game birds fat and healthy, but keeps out cattle and other animals. It has helped Sabins build his turkey crop to a high level despite drouth. (Photos by A. C. Jorns.)

Let's Get Acquainted!

The Commission's game wardens form the Enforcement Division. But today's warden is much more than an enforcement officer.

By ED H. FERGUSON, JR. Staff Writer

Seventh of a series about the organization and functions of the Game and Fish Commission

The development of the present Law Enforcement Division of the Texas Game and Fish Commission has been very slow. The legislation of 1907 had created a game department which was to function as a part of the existing fish and oyster commission, provided it could sell enough hunting licenses to pay its own way.

The earliest available record of the sale of hunting licenses came in 1910. It was also about this time that the first game wardens were hired by the commission. For the next 13 years no more than a dozen wardens were employed by the department at any one time. During that period much

Captain E. M. Sprott, Director of the Law Enforcement Division



of the money taken in on hunting licenses was diverted to channels that were not even remotely related to game conservation.

It was not until 1923 that the entire game fund was turned over to the game department with the authority to hire any reasonable number of wardens within its power to enforce game laws. About 45 wardens were placed in the field at that time with the result that the sale of hunting licenses soon doubled, and game laws were more strictly observed. By 1930 more than 100 game wardens were employed by the department.

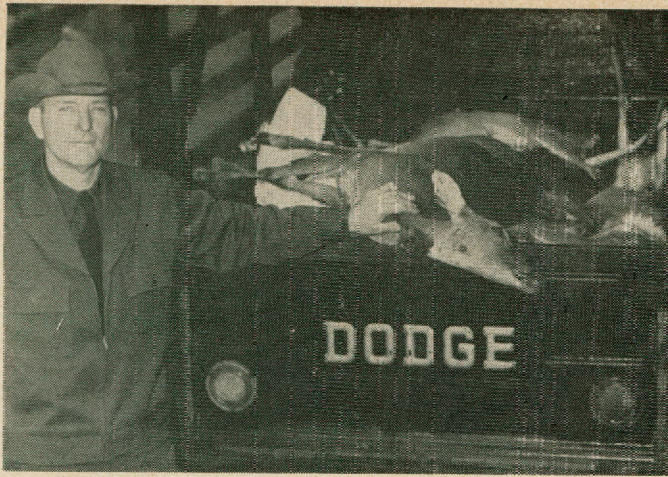
The Law Enforcement Division of the Commission has now grown to a point where it employs more than 200 personnel in the enforcement of game laws over the entire state. The state is divided into eleven regions. A regional supervisor is assigned to each region and has within his jurisdiction the game wardens and free service wardens who are assigned to his region. The eleven regions as you will notice (see chart on page 16) are not equal in size. In some regions warden supervisors have larger human populations, in others there may be larger game populations, while in still others the work load due to type of terrain, accessibility, or hunting and fishing pressure may require a larger number of game wardens for a given area.

An individual game warden may be assigned as many as six counties to cover if work load, game and human population are such that one man can handle the area. In a highly populated area such as Harris County two or more wardens may be assigned to a single county.

The game warden who is assigned to an area where there are only small towns will normally become well known throughout the communities in his district. He will speak often at local club meetings, schools, etc., and will make good use of conservation materials such as films, pamphlets, magazines, etc. that are made available to him by the Commission and through other sources. Much of his time will be spent in patrolling his area and bringing in game law violators.

A game warden assigned to an area where there is a large city will have to budget his time more closely than the small town warden. He will spend more time in the office corresponding with people in the city and with the central office of the Game and Fish Commission in Austin. Much of his time in the field will be used in checking retail and wholesale fish dealers. Each of these dealers must be inspected periodically and licenses issued to them.

Another problem that needs a great deal of attention in the larger



On the land . . .

. . . Texas Game Wardens enforce Texas game laws in their districts. They collect evidence in the case of violations and file cases in the local courts. The Game Warden is also the official representative of the Game and Fish Commission and as such is responsible for informing the public on wildlife conservation and the program of the Texas Game and Fish Commission.

town and the city is the problem of pollution. Industrial manufacturers have the problem of disposing with industrial wastes. These manufacturers have in the past emptied many wastes into public streams and rivers. The Texas game warden must check on stream pollution resulting from the disposal of these wastes and file cases on individuals responsible for stream pollution.

Pollution is also a big problem in areas where there are a great many oil fields. A few oil field operators are prone to dispose of salt water and other wastes from their fields in public streams rather than to dispose

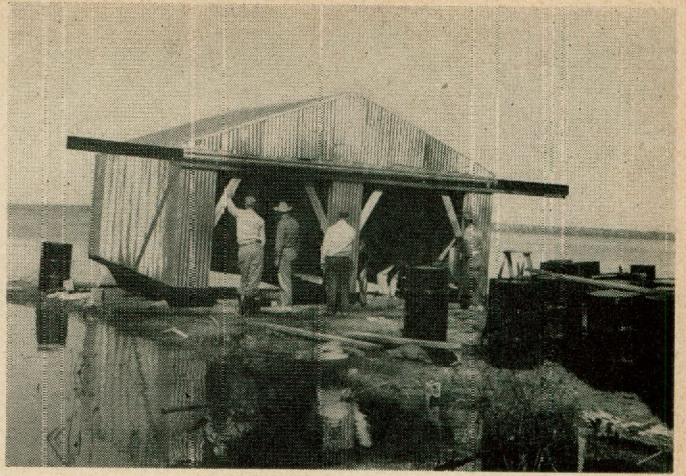
of them properly. Local game wardens must check on stream pollution from such sources and file cases where necessary.

The Commission is responsible for the enforcement of pollution laws when the welfare of fish or wildlife is threatened. The Department of Health takes over in cases where human welfare and health is endangered.

Other problems that may develop in a game warden's district are many and varied. For instance in an area where there are small farms and a good supply of wildlife that is protected by law, the warden might be-

come involved with the question of what to do when the protected wildlife eats the farmer's crops. There is under Texas laws protection for this farmer and each warden on the force knows what should be done in such a case.

In another area a warden might come in contact with an individual who has a pheasant cock but no hens. This individual tells the warden that he does not think he has to have a game breeders license to keep this cock because, in the first place he is not going to breed the pheasant, and in the second place he obtained the pheasant from out of the state and

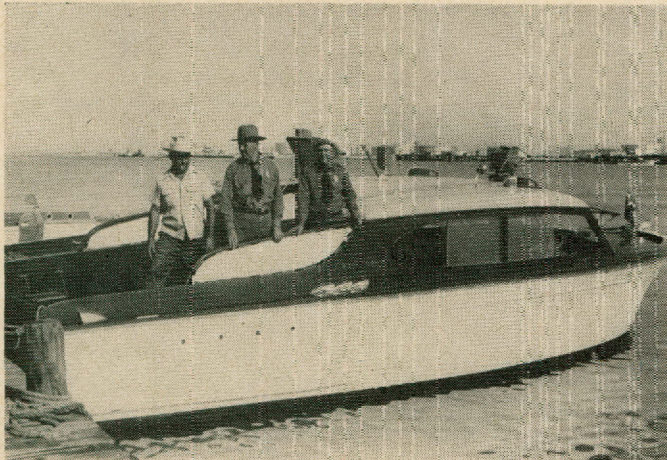


On lakes and streams . . .

. . . periodic patrols helps to enforce fishing and hunting laws. Game Wardens shown above are preparing to launch a boat house on Lake Houston. This house will store boats to be used in patrolling the lake. Similar houses have been provided on many other lakes and streams in Texas.

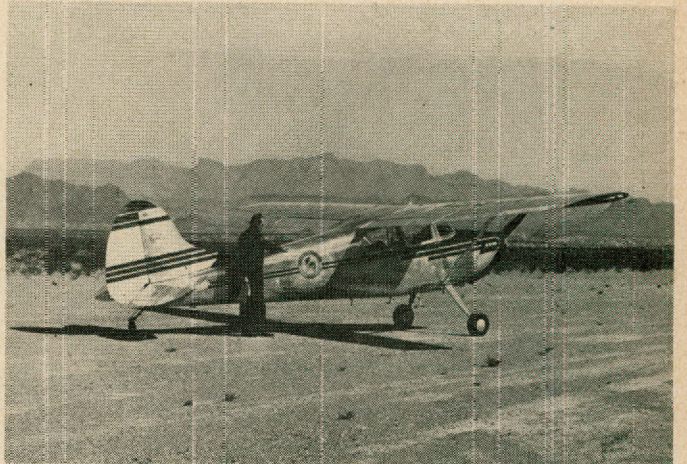
On the Gulf of Mexico . . .

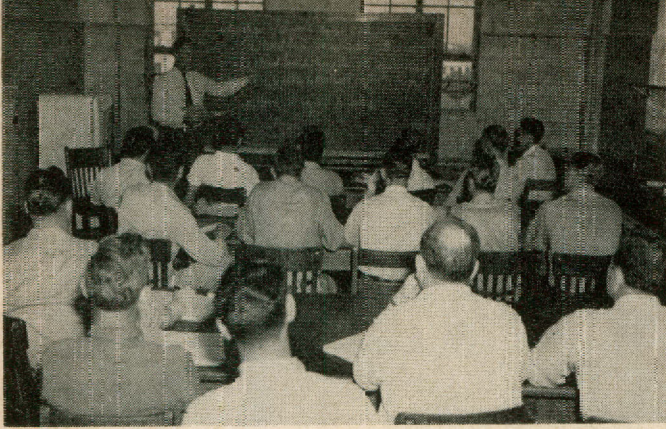
. . . coastal Game Warden patrols keep out an eagle eye for the use of illegal fishing methods and the taking of illegal catches. These patrols are also responsible for spotting pollution inlets that might become dangerous to fish life.



In the air . . .

. . . game wardens Frank Hamer, Jr. at Alpine and Claude E. Keller at Victoria utilize their aircraft for spotting violations of Game and Fish laws. They report these violations by radio to game wardens patrolling the area on the ground for further action.





The Game Warden school at A. & M. College provides an extensive course in wildlife and fish management, public relations, and the operational procedure of the Game and Fish Commission. Every potential game warden must pass his four-months' course before he is commissioned a game warden.



Game warden refresher courses are held each year at different locations in Texas. At these refresher courses there is a review of problems that have developed during the past year in various sections of the state.

doesn't see how he could be prosecuted.

The warden, after appraising the situation, would be able to advise the individual that he would have to have a collectors permit to hold the bird in captivity if he is holding it only for exhibition, but if he plans to sell or breed the cock he will have to have a game breeders license. He can also advise the individual that even though the cock was brought in from another state, it became subject to Texas law when it was brought across the border.

These are but two of the many

problems that a game warden must solve for individuals in his district.

In order to provide sufficient background for solving such problems the Commission has provided a school for prospective game wardens at Texas Agricultural and Mechanical College. All permanent game wardens now hired by the Commission must complete this course. Trainees are chosen from hand-picked and tested applicants who have had preliminary training in the field as seasonal wardens.

The four month school at Texas A. and M. includes courses in fish

and wildlife management, English, public relations, and game and fish laws. The course is designed to fit the potential warden for his future responsibilities to the people of Texas.

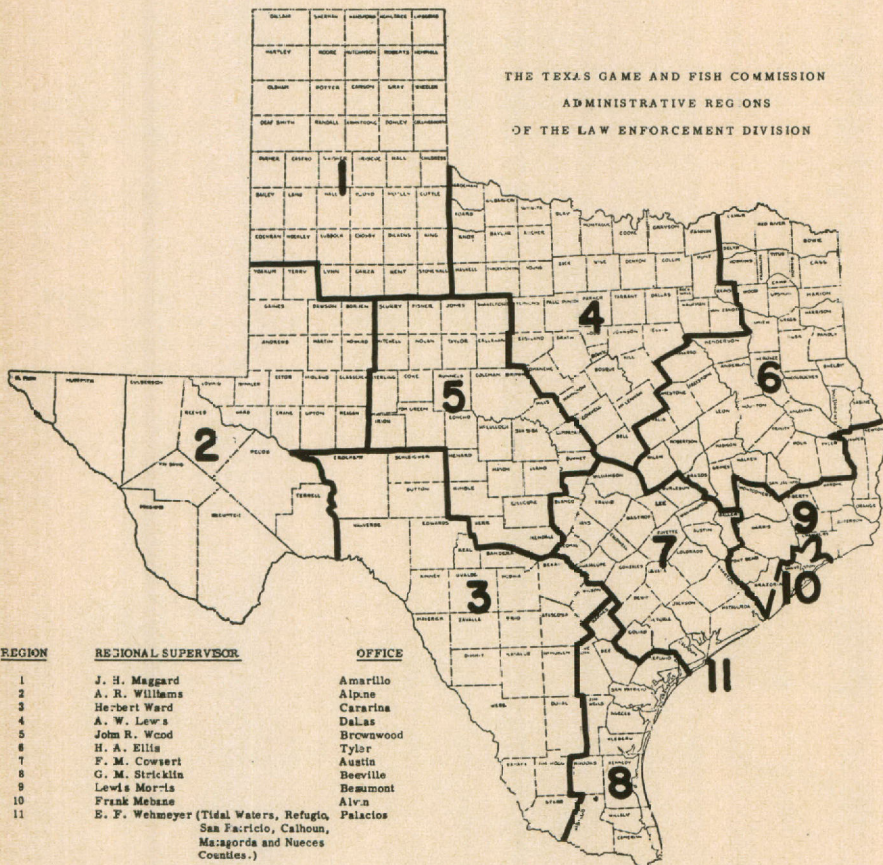
The Game and Fish Commission also conducts a refresher course in two sessions for Texas Game Wardens once each year. Each session of this refresher course lasts for three days. The warden force is divided into two groups so that no region of the state will be left without a warden at any time, and half the force attends each session.

At the refresher course game warden personnel review problems that have developed during the past twelve months and personnel from the Austin office discuss new policies set up by the department. Perhaps one of the most important functions of these refresher courses is the renewal of a personal relationship between field and office personnel which is so important in such a widespread organization as the Texas Game and Fish Commission.

One of the most important recent developments of the Law Enforcement Division was the innovation of a short wave radio network. The Division had long needed such a network for efficient law enforcement work; however, it was not until 1949 when equipment was purchased by local ranchers for the use of wardens D. W. (Blackie) Bowers at San Saba and Bill Sumbling at New Braunfels that the ball really started rolling for equipping wardens with short wave radio equipment.

By 1950, the Law Enforcement Di-

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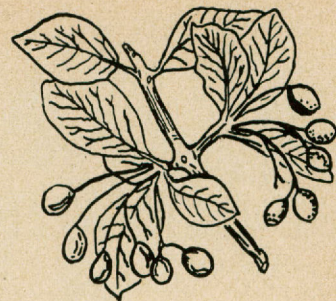


EAST
TEXAS

FLESHY FRUITS prove attractive to BIRDS



Hawthorn



Black Haw

For those interested in attracting birds, here are tips from a study made of East Texas plants. This is a condensation of the original paper.

By WILLIAM H. DAVIS

Illustrated by the Author

Although Trinity County's 204 square miles lie in one of the main flyways of migrating birds, it is known to have about 90 permanent species of birds which nest within the county.

With such a large number of native birds, it would appear plausible that its rich farm lands could fall heir to a number of migratory song and game birds if 37 fruits, available in small quantities for part of a year, could be increased to take care of year-around needs.

These fleshy fruits are important to the birds because of their fleshy pulp, which is easily digested, while the seeds furnish roughage needed in their everyday diet.

A study of the 37 fruits, recently made in an attempt to assist the public in planning the attraction of birds, includes a description of the fruit and its habitat; its availability; a list of birds attracted to the fruit; and other important information.

The hawthorn, a shrub widely distributed over the entire county, will thrive on almost any type of soil, but grows best in thickets along creek and river banks. It was found attractive to at least 39 species of native birds.

Growing in sandy loam areas and

important to birds for food, shelter, and nesting purposes, the black haw is also found throughout the county. Thirty-five birds are known to eat this luscious fruit.

A very popular shrub because of its thicket-forming habit, the huckleberry constitutes a haven for birds and other wildlife. Its fast growth in sandy soil along stream and river banks is especially ideal for at least 46 birds which feed on its valuable fruit.

The blackberry and dewberry are two species of thorny vines so much alike they are described as one species. Very popular for birds because of its fruits, protective cover and nesting habitat, the vine will form impenetrable thickets in a year's time, growing in any type of soil. Feeding on its fruits are 146 species of birds.

Taking to the open sandy hills, the sumac provides excellent food for birds throughout the winter months. Some 97 species of birds are fond of the fruit of this non-poisonous species.

A very beautiful shrub because of its flower, the dogwood bears fruit as valuable to birds as the flower is to man. It will grow in all types of soil, but predominates in creek and

stream areas. The array of desirable birds attracted to this fruit includes at least 93 species.

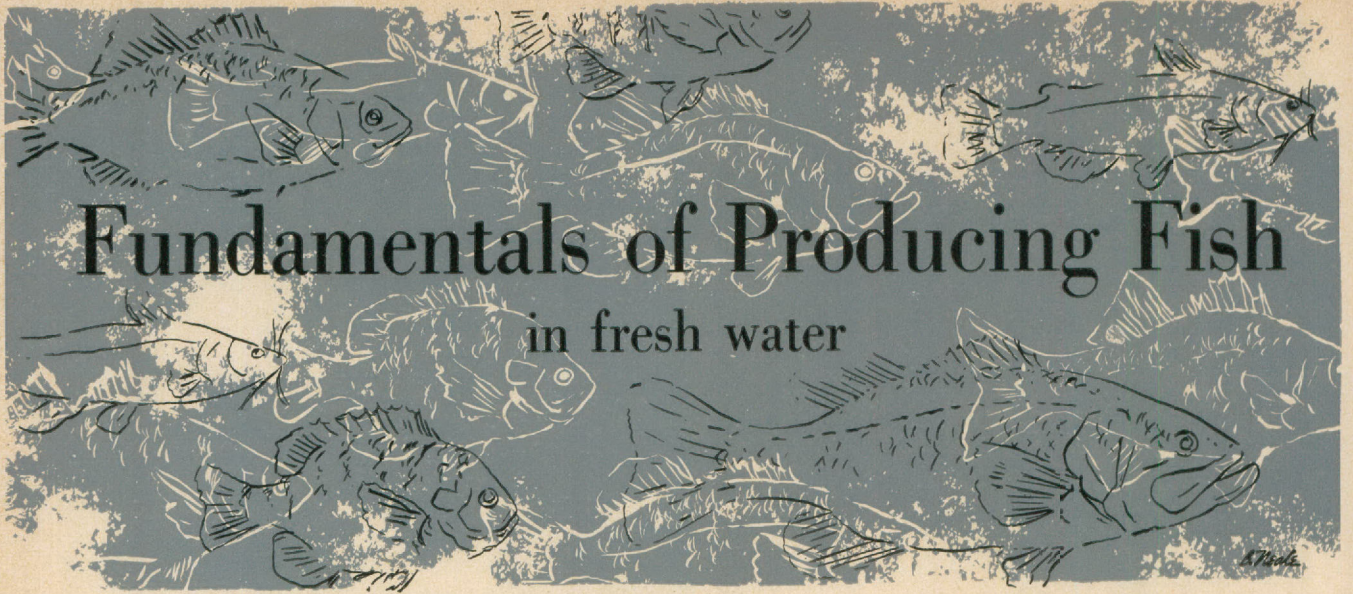
Prominent for its red berries around Christmas time, the holly is generally found in sheltered situations in sandy or moist soil. Its spiny evergreen leaves furnish food and nesting habitat to 48 species.

Also known as the smooth-leaved holly, the yaupon is found throughout the county in the sandy soil of sheltered creeks and ravines. Its berries, not quite as big as the true holly, are glassy instead of bright red. About 96 species known to eat this fruit in the United States are among the more important birds of Trinity County.

The elder or elderberry is found along streams and river bottoms where the soil is rich and loamy. Its fast-growing shrub usually grows in the thickets of other species, such as wild plum or hawthorn, and its fruit is attractive to 118 birds throughout the United States, as well as those in Trinity County.

Tree-forming habits of the mulberry, found throughout the county in more or less open spaces in almost any type of soil, are important to farmer and sportsman alike. Its

• Continued on page 28



Fundamentals of Producing Fish in fresh water

INSTALLMENT VI. CREATING MORE FISHING WATERS

By DR. R. W. ESCHMEYER

THE FARM AND THE CLUB POND

PUBLIC FISHING LAKES

BIG RESERVOIRS

CLOSED WATERS

PUBLIC ACCESS

IF THERE is a big demand for a farm crop, that demand can be met partly by increasing the yield per acre through fertilizing, use of better seed, better cultivation, or by some other method or combination of methods. However, if the demand is great, it can be met mainly by putting more acres into the production of this particular crop.

In areas where fishing waters are few, we can help the fishing somewhat by managing these limited waters as wisely as possible. But, on even the best-managed waters, the production of fish is limited. The answer to heavy fishing demand, in areas with few fishing waters, is a simple one. The demand can be met properly by putting more acres into fishing waters. Fortunately, this fish conservation "tool" is getting more and more use.

The only alternative to creating more water would be to stock the limited waters heavily and repeatedly with catchable-size fish. While undoubtedly effective, it is a method which would be financially imprac-

licable for warm-water species; and, it would be highly costly for trout.

The new waters fall into three major groups: farm ponds, public fishing lakes, and reservoirs built mainly for purposes other than fishing. Getting access to existing waters, too, can be regarded as a part of the "creating-more-fishing-water" program. The several kinds of waters will be discussed separately.

So far as we know, there is no exact information on the number of fish-producing farm ponds in the United States. The best estimate seems to be that this number now exceeds a million, and probably approaches two million.

Any one of these ponds supports only a limited amount of fishing, but the fishing potential on the ponds, collectively, is immense.

If we had only a million ponds, averaging a half-acre in size, and they were managed to yield a hundred pounds of fish per acre to the angler, the catch would add up to 50 million pounds of fish.

If each pond provided only ten

days of angling recreation, it would add up to one fishing day for each sixteen people in the United States.

A single pond may seem insignificant from the standpoint of national fishing, but the ponds, collectively, can and do contribute very decidedly to our angling.

There are still many problems; some ponds aren't built properly, some aren't managed intelligently, some are unproductive because of poor watershed management. But, these limitations are gradually being overcome by research and education.

Some farm pond advocates put heavy stress on the pond as a source of meat for the farmer. If our own rural background was typical, this argument has limitations. After a hard day of physical work, the farmer may enjoy catching fish, but cleaning them is another matter. There was a time when this created no problem—when men caught the fish and the women folk cleaned them—but that day seems to be past. Chances are that the average farmer will take care of his meat problem

by butchering a cow or hog at intervals.

The big future for the farm fish pond, as we see it, lies in its furnishing a cash income, by allowing others to fish the pond, for a fee. This will be true particularly during periods of low income from the regular farm products. The pond, admittedly, wouldn't be a big source of income, but such income would be an added value, with stock watering, recreation for the farmer's family, etc., as the major values.

Many sportsmen's clubs have built fishing lakes, usually for use by club members. Those are excellent projects. As a rule, they are bigger than farm ponds, though the problems are similar. The tendency is to expect too much from these ponds. An annual take of 100 pounds per acre would be well above average, because club ponds tend to be built on relatively unproductive (less costly) lands. For a club with a hundred members, this would represent one pound per member per acre year. Of course, the pond could provide an endless amount of badly needed relaxation, even though the yield in "meat" is limited.

A number of states are now using some of their fishing license and Dingell-Johnson (federal aid) money to build public fishing lakes, usually ranging in size from fifty to several hundred acres. A survey made by the Sport Fishing Institute in 1953 showed that some 163 such lakes had been built in the preceding five years, and that 70 more, averaging 120 acres, were under construction or in advanced planning stages.

The Alabama conservation department has demonstrated what can be expected from such a program, by keeping a record on its state-built fishing waters. In 1953 the state's eleven such waters (total acreage 591) attracted 100,183 fishermen (fisherman-days), and yielded 357,714 fish, weighing 99,871 pounds. This averaged out to 170 fisherman-days and 605 fish weighing 169 pounds for each acre of water. These lakes, built since 1947, are located in areas with insufficient fishing water, are fertilized, and are located in watersheds where they

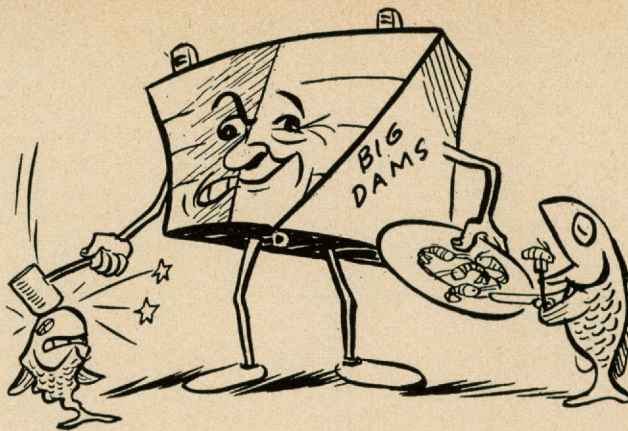
are relatively free from erosion.

In a number of states the lake-building programs should have high priority. Of course, they will have continued good fishing only if properly managed. Since we still don't know, in many areas, what constitutes proper management, it's essential that a good, down-to-earth fact-finding program accompany the lake building projects.

One item merits special consideration. There is a tendency to suggest building lakes on relatively unproductive land, because of the higher cost of land in productive watersheds. Despite the lower initial cost, this is a poor practice to follow. A study of two state-built lakes in Tennessee, similar in size and construction, showed that one draining productive soil had an excellent fish yield. The other, in a nearby but unproductive watershed, did very poorly. In water, as on land, the amount of nutrient materials available largely determines the potential carrying capacity.

Here we have a controversial subject, mainly because of the tendency to be all for or all against dams. Some have been highly beneficial to fishing; some have been harmful. You can't generalize on the effect of dams on fishing; each dam or potential reservoir must be considered separately, along with the present or proposed operation program for that particular body of water.

For example, dams built for other purposes have greatly increased the fishing in the South, from Texas



You can't generalize on the effect of dams on fishing; each dam or potential reservoir must be considered separately.

and Oklahoma to the Carolinas. They have been detrimental to fishing in other areas, particularly in the Northwest. Here, construction of high dams threatens extinction of important anadromous species of salmon and trout.

In the Tennessee Valley, after impoundment, fishing increased 45 to 50-fold on storage waters and 10 to 15-fold on the main stream. This survey was made some years ago; on some waters the fishing intensity has increased rather decidedly since that time. For example, fishing in the TVA tailwaters below the main stream dams has been rising steadily. Daily counts for the 1954 fiscal year showed 966,334 man-days of fishing immediately below nine main stream dams. This was nearly three times the 1947 estimate of 339,000.

Because of the dam-building program, fishing in parts of the South is much more extensive, and more successful, than it was twenty years ago. The improvement was by accident, not by design. It happens that here good fishing waters were few in pre-impoundment days. Too, in a normal year, operations do not prevent the development of a fair-sized crop of fish. Major drawdown is in winter, when it interferes little with fish populations. At spawning time the reservoirs are filling, with water levels generally rising slowly. Erosion is limited enough so that the waters are not too muddy over long periods of time for good fish

● Continued on page 30

Fish Reports

Field Data

Texas Tracks

By JAY VESSELS

HENRY OR MABEL?

Wildlife Biologist Willie Parker of the Game and Fish Commission staff, complains that the new Spanish red-legged partridges being introduced in West Texas "all look alike." That is the males and females have no distinguishing color markings. Parker says the only apparent reliable difference is that the male has a small spur on its leg. He added that technicians conducting the stocking experiment simply will have to watch closely to determine which ones start laying eggs.

NAUGHTY BUT NICE

Outdoor Editor Roy Swann of the Corpus Christi Caller-Times, closed a long report on an all-night "bobcat" hunt with: "So, after the dogs had been thoroughly disciplined for 'chasing a dern coon' we trudged back out tired but pleased." Actually, the spree staged near Swinney's Switch, wherever that is, had produced a prolonged hubbub when the pack jumped a cat but finally were tricked off the trail by the beast's cunning tree-hopping.

SAFETY FIRST

Outdoor Editor Woody Montgomery of the Temple Telegram, lectured fishermen and boaters recently on boating safety: "Time and again last year, the word came of a drowning and not one drowning victim had on a life jacket. Even if a person is a good swimmer, he sometimes loses his head in a boating accident and someone has to pay, maybe with a life." Incidentally, none of the first six boating victims reported this year wore life jackets.

CONCENTRATED CONFLICT

Balance of nature or what have you, marsh and Cooper's hawks gave Game and Fish Commission wildlife biologists a hard time during this year's mourning dove trapping in the Rio Grande Valley. The hawks winter in the area where the doves concentrate and apparently thought penning up the doves (for banding) was for the predators' own convenience. It required the combined efforts of biologists and helpers, and use of shotguns, to convince the hawks that the doves were doing their bit for scientific study and should be spared.

ANSWERS TO REMEMBER

The Sports Fishing Institute Bulletin contained this gem under the heading "Conservation Education": "Observations found in our daughter's notebook for Science (7th grade)—'Why do you kill off fish? We kill off fish because in some places there are too many fish. That makes not enough food. So the fish do not grow very big. Then we just kill off some and the others have enough food and grow to good sizes. Why do people tag fish and animals? People tag fish and animals so that they can find how far they go. Some fish have crossed oceans while rabbits have hardly crossed over more than about two to four acres. How is the land plowed and why? When a farmer lives on a hillside and he plants his crops on the hillside he would plant his crops across because if he planted his crops straight up and down the water would all run off taking good soil with it. Farmers try to make it harder for the water by planting their crops across.'"

MIGHTY MULLET

A six-pound, five-ounce mullet was netted by Aquatic Biologist Ken Jurgens' crew on Lake Buchanan near Austin. Its length was 24 inches. "Mighty large," observed Jurgens, "for a mullet this far from the coast, especially since there are six dams between Lake Buchanan and the mouth of the river."

HOW DEEP IS DOWN?

A new electronic depth sounder so small that it can be carried in a rowboat for charting the bottoms of lakes, rivers and shoal waters, is described in *Inventor-New Product Digest*, Austin magazine devoted to science and invention.

DUSTY'S BIG MOMENT

The Austin *Statesman* carried the story about Dusty, a Canadian Cocker, which was brought up with three kittens and thought he was a cat. That is he did until one night recently when a stray possum treed just off Dusty's backyard kennel. The yowls awoke everybody within ear range and proved conclusively that little plain meows just wouldn't get the job done.

COLUMNIST'S CONFESSION

Andy Anderson (there are two such outdoor columnists in Texas), writing in the Fort Worth Press: "Through the regular channels, I heard of 'a bush' in Lake Whitney where you could tie and get your limit. It wasn't too far, and I had four hours. It took an hour to go and an hour to find the 'bush.' In the next hour, using the Arkansas Razorback, I picked up eight black bass."

Press Views Game Notes

CRAZY LIKE A QUAIL

Roy Swann, Outdoor Editor of the *Corpus Christi Caller-Times*, broke down the hunting fatalities for the 1953 national season and found: 58 per cent of the hunters deliberately shot were mistaken for deer; 16 per cent for squirrel; five per cent for rabbits; four for bear and woodchuck; three for pheasant and turkey; and one per cent for ducks and quail. Gus T. McMammal says the whole thing sounds squirreley to him.

AIN'T NATURE GRAND!

At the north end of wild-like Lake Austin, a carful of city folks unloaded for their first spring outing. A girl about ten immediately began scrambling toward a bluff. Shortly, she screamed, "Wild animals up here!" She scurried back down, stopped again, then said, "Hear that?" There was a considerable scuffling of rocks along the cliff. "Had white tails," exclaimed the girl. "Maybe antelope," said an older woman. "Probably deer, with white tails," said a man. There was a craning of necks. Then came a "B-a-a-a-h!" "See, what did I tell you?" pressed sissy. What they finally deduced was not determined. But the herd of goats moved dejectedly on up the ridge. Their winter honeymoon was over.

EAST TEXAS DEER

Wildlife Biologist Dan Lay of Buna certainly stimulated happy dreams with his latest reports on East Texas deer prospects. He said progress in restocking plus better law observance "means that widespread good deer hunting is potentially just around the corner."

VARMINTS IN DISTRESS

Gus T. McMammal, an old farm boy, was out doing research with some No. 4 chilled shot a while back, when he walked across an old creek bottom. There, quietly lapping from a stagnant, cattle-stained pool was an anemic opossum. Gus walked right up to the pathetic creature but it just looked around and then went on drinking the greenish liquid. Returning later, Gus noticed a great turtle parked at the pool's edge. It, too, made no effort to move. The strange scene blended into the Animal Kingdom's plight from the drought. Verily, mass extermination of many species, large and small, is threatened by the prolonged dry spell.

PUSH-BUTTON TECHNIQUE

Courses in many of today's schools, all the way back to the lower grades, now include wildlife material. Arithmetic may include the number of eggs a quail hatches, and student artists may draw fish and deer as well as apples and fire engines. A young fellow from North Central Texas apparently got caught in the squeeze when he was having preferable thoughts such as baseball or swimming. Anyway, he wrote Austin headquarters of the Game and Fish Commission, which provides scholastic material: "Dear Sir: I would like one of those books and pictures. And a booklet of how to do that stuff."

FUTILE SALVAGE

Marion Toole, Chief Aquatic Biologist for the Game and Fish Commission, advises persons concerned with salvaging fish from drought-shrunk tanks, to catch the fish and eat them. He said the Commission lacks the facilities to handle such salvage and that efforts to save the fish for brood purposes generally fail. "For one thing," he said, "the water gets stirred up in the shallow tanks and the fishes' gills become so fouled with silt that few of them survive. My best counsel is for the folks to enjoy some good fish fries, and look ahead for the return to wet days and restocking."

SMELLY LOCKSTEP

Jake Petmecky, the pioneer outdoor outfitter, wanted to know if polecats migrate. Nobody could confirm or deny the theory. "Man, I saw a whole field full of skunks moving in one direction," said Petmecky. "Every one holding its tail high, too!" Jake took off in the opposite direction, like a horse with a high tail. Phew-e-e-e-e!

SLIT TRENCH TECHNIQUE

Julian Howard, manager of the Aransas Wildlife Refuge, is using a standard combat device to help maintain his waterfowl ranges. He has latticed low areas with jumbo size slit trenches, fifty feet wide, three hundred feet long and six feet deep. These are in addition to dikes and dams across drainage plots. They are designed to intercept water when the rains come and meanwhile, to catch seepage. Through the water program, Howard attracted just less than one hundred thousand ducks at the peak of the wintering season and also housed more than eight thousand wild geese. One of the reasons so many waterfowl deserted the upper coastal areas during the fall harvest was lack of fresh water in the feeding marshes.

BALD EAGLE NEWS

Ornithologists report that at least eight bald eagles have been counted in the South Texas county of Colorado this winter. Some of them have been around a great while, as birds go. They have white heads and tails. These birds are brown colored during their first two years of life. The mature eagles are massive in size and by comparison reduce a buzzard to sparrow-like proportions.

BARRED OWL? OUCH!

You just cannot win sometimes. Take those Dallas city fellers who organized a posse to curb the wolf menace in a North Texas community—and came home with everything but a wolf, including a barred owl, which turned out to be a protected bird.

GUNS

and

SHOOTING

The New Marlin 322

Every now and then a new gun or gun accessory makes its appearance. I usually look over the new stuff as it comes from the manufacturers, and try to weed out the really good stuff for notation in this space. Usually I let "Shooting Shorts" serve as the clearing house for these products. Recently, however, I have had occasion to examine and shoot Marlin's new Model 322 varmint rifle chambered for the Remington .222 cartridge, and I have been so impressed that I have decided to devote the whole column to it this month.

Physically, the 322 is a neat little gun. Its overall length is 42 inches. Its weight is about 7½ pounds, which is surprising since its 24-inch barrel is definitely on the heavy side. Marlin calls it medium weight, but it's about what a barrel maker would call heavy sporter.

The stock is American walnut, and is fitted with a hard rubber butt plate and grip cap. It is very tastefully hand checkered at the pistol

Shootin' Shorts

Bateman's Sporting Goods here in San Angelo now has Weatherby rifles and ammunition for sale. The ammo is in Weatherby brass, made, I believe, by Norma. Leonard tells me that he can also supply brass for Weatherby calibers.

I have one of the new Leupold Westerner 8X varmint scopes which I am going to try out and report on later. It's a pretty thing, and if it is typical Leupold quality, should be a little gem. More later.

grip and on the forearm. It is fitted with sling swivels.

The heart of the little rifle is the Finnish made Sako Mauser action. This action is very well made, and is fitted together with watchmaker precision. Scope blocks are integral, as can be seen in the accompanying illustration. The action is clip fed, with a magazine capacity of three rounds. The clip release is in the front of the trigger guard. The gun can be loaded single shot very readily, since the extractor will go over a round already in the chamber.

The trigger is fully adjustable, and can be made just about as slick as any trigger I ever saw. It is similar in construction to the Model 70 Winchester trigger, but I believe it is a bit smoother.

The safety rocks back and forth much in the order of an Enfield. There is a little firing indicator integral with the safety.

As it comes from the factory, the rifle is fitted with a hooded ramp front sight with a gold bead, and a slick little peep sight that fits on the back scope block.

This little peep sight is fully adjustable for windage and elevation and has the novel feature of an eccentric aperture with permit rotating the sight from a 100 to a 200

By JOHN A. MASTERS

yard position. This is a handy little feature, and seems to work out fine in practice.

The rifle features Marlin's Micro-groove rifling. This is a new thing in a way, and old in another way. It has been done before, but Marlin has a new look to it that seems to be working out splendidly.

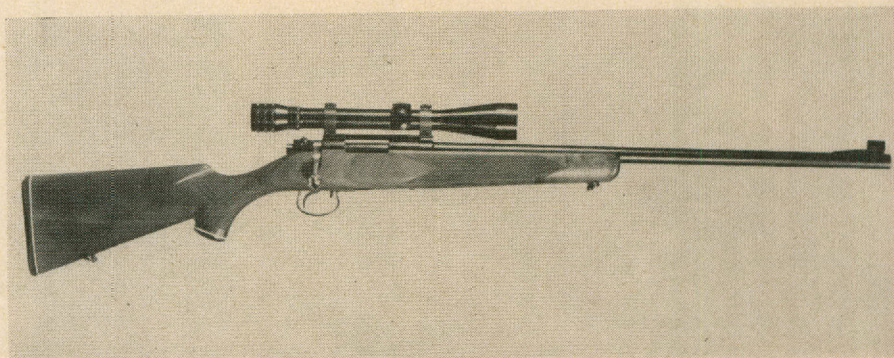
Briefly, the system consists of sixteen shallow lands and grooves, with a bore diameter slightly larger than standard. The idea is to cause as little bullet deformation as possible, and at the same time give a better gastight seal. It seems to do both.

My rifle has consistently grouped under one inch. It has done so with both factory loads and all sorts of handloads. I believe it is the only run of the mill factory rifle I ever shot that has done so.

My friend Harold Harton, stock maker of Lampasas, Texas, has reported some rather revealing figures. His Model 322 gave him the following: With 20.5 gr. 4198, and a 55 grain Hornaday—.255 inch at 100 yards. With 20.5 gr. 4064, and a 55 grain Hornaday—.490 inch at 100 yards. With 25 gr. Hogdon Ball and a 55 grain Hornaday—.497 inch at 100 yards.

These are excellent five shot

Marlin Model 322 with Stith dovetail mount.



groups from any rifle. Harold believes his will hold one-half inch at 100 for a five-shot group, and that's real shooting.

As mentioned earlier, the receiver is dovetailed for scope mounts. The accompanying illustration shows the Stith Dovetail mount for the Sako. That's what I have on mine, and it's a good solid rig. I like it.

Leupold makes a nice adjustable base for the Sako. Friend Gus Novak has his Stith 6X on one of these, and it's a nice lashup.

The Model 322 retails for \$119.95, and is, in my opinion, worth every cent of it. It is one of the finest factory products I have ever seen in the gun line, and should prove very satisfactory as a medium range varmint gun.

Free Bulletin Identifies Fish

A bulletin entitled "Food and Game Fishes of the Texas Coast" is available for the use of fishermen, schools, wildlife clubs, civic groups, and individuals, and may be obtained by writing the Texas Game and Fish Commission, Walton Building, Austin 14, Texas. It is free of charge.

A partial list of its contents includes food, names, and a diagram showing how to identify fish by the proportions of its body, the number of spines and rays in the fins, the location of body parts, the scale count, teeth, the eye diameter, and the internal anatomy. Also listed are seventy different species of fish. Each is illustrated and accompanying text gives its common name, its scientific name, description, range, and habits.

The Bald Eagle

• Continued from page 3

with a white face, for instance, is still often referred to as a "bald-faced" horse. A bald eagle also has a white tail, but the rest of his body is brown. He is about 30 inches in length and may weigh as much as 12 pounds.

Eagles mate for life. Only when bereft do they find another mate. They build the most spectacular nests imaginable, usually placed at a considerable height from the ground in the very tallest trees in the vicinity and never far from a large body of water. The nests may measure as much as six feet in height and six feet in width, and are built of sticks and lined with straw or cornstalks and any soft material available.

The mated pair, or its successors, return to the same nest for many years, adding on to it and repairing the damage incurred by their absence. In time the nest becomes enormous. An eagle nest near Vermillion, Ohio, was used continuously for thirty-five years. It measured 12 feet in height and was eight and one-half feet across its top. Its tremendous bulk finally caused it to fall; and the estimate of its weight after the fall was about two tons. Eagles sometimes bring queer articles to their nests—light bulbs, shoes, bottles, and the like have been found.

Young eaglets usually spend the first two and one-half months of their lives in the nest. During that time, both the father and the mother bird are quite devoted and conscientious parents; they bring in fish or other food, depositing it in the nest and then standing on it to tear off small pieces of the flesh for the young birds.

Not until the birds are about three years old do they acquire the plumage by which we know them—the pure white head and tail that glisten in the sunlight as the eagle sails through the air. Before this time, the young eaglet is completely brown and has therefore often been mistaken for the golden eagle. There is, however, one never-failing distinction: the lower part of the leg of the bald eagle is nearly bare, while the golden eagle is feathered

to the toes. Artists have sometimes portrayed the national bird mistakenly by showing these feathered trousers extending all the way down to his feet.

Some bald eagles eat nothing but fish. They live near lakes, shores, or large rivers so they may search for live fish on the surface of the water or dead ones cast up on the beaches. They also eat lizards, frogs, rabbits, and other small animals.

The water birds they sometimes capture are usually only birds that have been crippled or injured by a hunter or in some other way. If it is true that one-third of the ducks shot are never retrieved, then the bald eagle's hunting may have a humane angle. If he occasionally takes chickens from a farmer's poultry yard, these offenses are probably offset by his commendable scavenger work of keeping our beaches clean of dead fish.

There has been a decrease in the ranks of the bald eagle because its favored breeding places are being rapidly reduced in many sections of the country. In Florida, for instance, where the eagle is more numerous than in any other state, thousands of acres of large pines have been cleared for housing construction and for market gardening. Another factor in the decrease is a natural one: the small number of eggs laid by these birds, two being the average. Congress in 1940 forbade the killing of the bald eagle in the United States, so he now has federal protection; but we see him less frequently than in the past.

The bald eagle is pictured on many of our coins and on our dollar bill, and also on our United States coat of arms, which appears on the Great Seal. He is our proud symbol of freedom and independence in a mighty country. The sight of him soaring through the skies is as impressive as that of the newest flying machine.

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Hunters Harvest

• Continued from page 13

and they're showing it. Lot of them are little runty things exactly like you'd expect from that kind of reverse breeding program.

"I try to help my deer build up their herds the same way I try to build up my cattle—with management that lets nature take her best course."

"Sure," he added, "I guess you'd call it commercializing hunting. I know that's what it is. But we may as well face facts; that's another part of this changing day and time.

"It's either commercialize, and do it right, or not have anything left in the way of deer. Some of the ranchers are almost out of the deer business now, largely because they've cleared so much brush and overstocked with sheep and goats for a long time."

He got up and walked over to the fence and watched the half dozen doe that were still picking around in the alfalfa thrown them an hour earlier. They were fat and sleek, and one kept looking back as if she had a fawn close by some place.

"I take care of them now," he smiled. And as I get a little older—I figure they'll take care of me."

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Balance of Nature Three Texans Scan the Range

• Continued from page 10

those days, 300 head to the square mile was not uncommon. Grandfather remembers too that before his son could saddle a cow pony, the grasses had thinned and less than half as many steers could be fattened on the same range. Today, standing beside a fence that confines 35-50 head per section, comes the realization that a family name and an historical brand were bought and paid for by the land that now supports as much mesquite, cactus, lechuguilla, bitter brush and a host of noxious weeds, as it does range forage. Grandfather's view is disquieting because his mind answers the questions that his son and grandson would not ask of him. He never fully understood the meaning of biotic balance, although its absence is the lesson of his lifetime.

The father's view tells him what he thought could not be—that next year this range will hold only 30 head to the section. If only he could have rested the range—but taxes, bills, hoof-and-mouth disease, depression, drought and a war have forced him to urge the range to meet demands.

From spring to fall, he has seen the grass consumed down to its roots, and then, as if in scorn, the roots were trampled into the dust by too many hooves in search of more grass. From boyhood to manhood, he has seen the spring recuperation become less each year while more range has been left to the land-greedy nonpalatable weeds. No rest is yet in store for the weary range. "This is not my fault," the father rationalizes. If he recognized biotic balance as a remedy, its application was postponed in the face of economic expedience. That times will change is the hope of the father, whose view today indicates that thus far all he has given to the family legacy is an alibi.

The son, just home from college, knows that range can be classified according to the quantity and quality of the plants growing on it. He has learned from his training in range management about how many cattle can be maintained on a given

amount of forage. But to him the virgin range is a paragraph in a textbook or an old photograph; the longhorn is legend. In his own mind, too, is the awareness that something more than nostalgia causes the collective view of his family to be less than satisfying. It will take more than the "six gun—hell for leather" attitude of the cattlemen of grandfather's day to bring back the carrying capacity of this range. Any improvement on what he sees today is a step forward. He is young and will accept the challenge. However, unless he understands the importance of biological balance in the face of depression, disease, drought, war, high taxes, or rising standards of living, he, too, will stand next to this fence twenty-five years hence, and with bleached eyebrows and wrinkled, leather face, pass on to his son still another alibi.

Balance of Nature Fishing Ruined

• Continued from page 10

lake for a short distance; then the land rises and an almost mature stand of second-growth sugar maple with some hemlock and yellow birch completes the botanical setting. Three kinds of forests have given to this spot a variety of wildlife and a diversity of beauty.

The lake was also gifted with Wisconsin's finest sporting fish: the muskellunge. Twentieth century man in his quest for pristine surroundings could ask for little more. Such a place would have stirred the heart of Duluth or Radisson.

The man who holds title to this land was aware of its beauty and recreational value. He and his family spent many pleasant hours there. He was also generous in sharing his prize with others. But somehow he became uneasy about having always received from his land without giving something tangible in return. He decided to help the lake to produce more feed for the muskellunge by creating weed beds suitable for forage fish. A dealer in aquatic vegetation was consulted and in due

course plants from some distant point were transplanted into the lake. These introductions lived just long enough to inoculate the lake with a prolific alga which clung unnoticed to the introduced species. In a matter of a few years the lake began to "bloom." Each year since, an unsightly green scum has covered most of the lake by midsummer. The scent of pine is replaced by the stench of decaying algae. Whether the fishing has remained unchanged, it is difficult to say, since the time when the owner can fish is also a time when fishing conditions are least attractive. Only the solitude of his remnant wilderness was unaffected, and even this is best enjoyed elsewhere.

A desire to improve upon wild lands, if indeed improvement is necessary or even possible, must be preceded by a biological knowledge of the checks and balances which make for land harmony. In this case, a plant so small that individually it could not be seen by the naked eye, was added to an environment in balance. The resulting discord was felt both by the biota and by the man who are sensitive to the aesthetic as well as the practical value of biological balance, without knowing what it was or how it worked.

Too late, and as an afterthought, these things were made clear to him. That he understood is attested to by a statement made in retrospect: "Never again will I attempt to play God."

Balance of Nature When Predators Died, So Did Deer

Continued from page 10

buffalo was completely gone, cattle were filling most of its niche on the plains.

The wolf did not understand why his favorite food no longer had a humped back and shaggy mane, and probably cared less. But even with its longer horns, the humpless, maneless steer was also less belligerent and made an equally fine meal. In winning the West, the federal government disputed whether the wolf should have a meal of beef or any meal for that matter. The dispute was settled by the professional trapper in favor of his employer.

In the beginning of the trappers' reign, wolves and mountain lions were so plentiful it took a buckboard to bring in their hides. In short order a pack pony sufficed to haul in the grisly proof that man was still the supreme predator. Eventually a saddle roll was all the space required to take out the hides from a trap line that not so long ago necessitated a wagon. The law of diminishing returns, however, never set in on this type of trapper for he was on the federal payroll. His sole function was to eradicate the wolf to protect the cattle to help support the railroads to replace more wagon trains in order to bring men westward.

After the plains wolves were virtually extinct, the rattle and clank of trappers' hardware was heard in the hills. It was heard on the remote Kaibab where deer, mountain lions, wolves and coyotes were thriving and content in their own company. The Indian had ceased to become a biological factor on the plateau, and his absence made the biotic balance extremely sensitive. In less than a quarter century the professional trapper slapped his hands together obliquely, happy in the knowledge that undesirable animals had been removed from the Kaibab. The same might have been said of the trapper and his pack horses on their departure.

Soon the deer no longer held in check by their natural enemies began, like a restive volcano, to erupt. In a few short years the plateau was engulfed by a population of hungry

deer. The storehouse of food in the form of palatable plants became exhausted not annually, but permanently. The deer became its own worst enemy, and deer teeth, not lion and wolf fangs, accounted for the death of some sixty thousand animals in just two winters—by starvation.

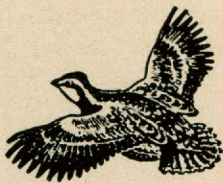
Here is a case where the stabilizing predatory animals were removed from an environment in balance.

'55 Duck Stamp Design Chosen

A black and white opaque watercolor, featuring three blue geese in flight over a cattail marsh, has been chosen as the design for the 1955-56 Migratory Bird Hunting Stamp. Drawn by Stanley Stearns, Binghamton, New York, the design will appear on the 22nd stamp to be issued in the Federal duck stamp series. A panel of waterfowl experts and post office officials judged Stearns' drawing as best among 93 designs submitted by 66 artists from every part of the country.

The "duck stamp" has become familiar to all migratory waterfowl hunters and to stamp collectors and conservationists throughout the country since the first issue in the series went on sale in 1934. A new stamp is issued each year by the Post Office Department. It goes on sale July 1 and expires the following June 30. Nearly twice the size of a special delivery stamp, it sells for \$2. Everyone over 16 years of age who hunts migratory waterfowl is required to have one of these stamps in his possession in addition to a State hunting license. Duck stamp revenues are used to supplement other funds appropriated to the U. S. Fish and Wildlife Service for the purchase, development, administration and maintenance of waterfowl refuges throughout the country.

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that all of the sodium arsenite should be applied to the water because if it is sprayed on marginal vegetation that cattle can get to and eat, the cattle will be poisoned.

Some species of minnows can be seined from a pond successfully but during warm weather golden shiners that are seined will be killed or will shortly die. If golden shiners are dipped out or trapped, however, they will be found to be a very hardy minnow that will live excellently in a holding trough, summer or winter.

DISEASES

This is a subject that alone requires a large size bulletin. Fortunately such a bulletin has been written and printed. It is *Care and Disease of Trout*, by H. S. Davis, Research Report No. 12, for sale by the Superintendent of Documents, Washington, D. C. for a price of 35 cents. This bulletin, while primarily

aimed at discussions and treatments of diseases of trout, is also most appropriate for diseases of minnows.

Three of the most common diseases encountered are fin rot, fungus and "Ich." Fin rot is caused by bacterial infection that is characterized by a progressive disintegration of the dorsal and/or tail fin. The disease can be detected by a white line that moves from the outer margins to the bases of the fins, destroying the tissue between the fin rays as it progresses. The best control of fin rot is accomplished by dipping minnows for one or two minutes in a 1 to 2,000 solution of copper sulphate (6.5 ounces of copper sulphate dissolved to 100 gallons of water). The minnows that are already badly infected should be destroyed because the dip will not cure them and it will prevent the other minnows not yet showing signs of the disease from becoming infected.

Fungus, *Saprolegnia*, a water mold, is readily discernible due to the fact that it presents a white hairy appearance. This organism usually occurs as a secondary infection following a primary attack on the fish by bacteria, flukes or protozoans. If scales should be knocked off by seining or the protective fish slime removed by handling it will permit spores of the organisms to attack the fish. In two of our hatcheries we have recently found that the spores attack fertile eggs of the black bass causing the death of the embryos. The control for fungus calls for dipping infected fish in either a 3 per cent salt solution until they show signs of distress or else dip the minnows for ten seconds in a 1 to 15,000 solution of malachite green (1/8 ounce in 15 gallons of water).

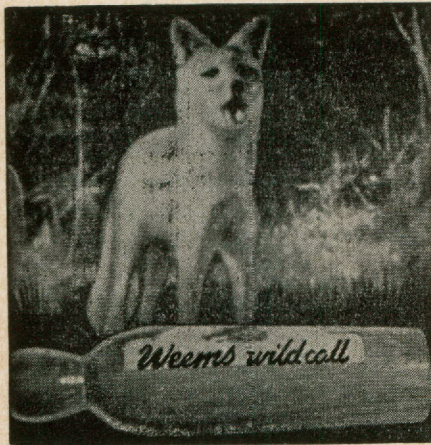
"Ich," *Ichthyophthirius multifiliis*, is a protozoan. Fish infected with this parasite look like they have been sprinkled with salt. Since it is hard to kill the encysted stage of these protozoans a suggested treatment is to hold the minnows in troughs that have a good current of water flowing through. The young parasites will develop from the adult

encysted in the epidermis of the fish and leave the cyst looking for fish that they in turn can use for their reproduction cycle but the swift water running through the trough will wash them away. The minnows should be kept in the trough of running water for several days after all the parasites on the fish have disappeared.

The best control of disease, however, is one of prevention. Our hatchery personnel makes a practice of giving all the fish a dip in the malachite green solution every time the fish are handled. When new fish are brought into the hatcheries they are checked for parasites, given a dip and quarantined for a day or so in troughs to see if any disease will develop. Another observation from our hatcheries reveals that when our fish are well fed, they are usually free of disease. This is particularly true with the small channel catfish's becoming infected with "Ich."

Under *Water Supply* it was stated that water introduced into the pond should be devoid of any type of fishes. One of several reasons for that statement is the fact that when fish are present in the water supply source, they can become infected by and incubate various types of parasites that can be carried by the water into the minnow ponds. Such cases have happened in several of our hatcheries.

The menace of disease epidemics is the reason that each pond must have its own water intake and waste outlet. The writer made a survey of one minnow hatchery that consisted of a series of twelve ponds in which water was pumped into the first pond that was provided with an overflow pipe running into the second pond and in like manner through the whole series until it was finally wasted from the last pond. An outbreak of fin rot occurred in the second pond and was carried through the next ten ponds in the pond series. Due to this epidemic, the owner lost over 750,000 marketable minnows. All minnows were killed except those in the first pond. With a different water sys-



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tem, he would have lost only those in the second pond.

HOLDING TROUGHS

Holding troughs can be constructed from wood, cement or metal. All new troughs should be treated before minnows are placed in them because no matter what type of material is used in their construction, a toxicant or pollutant may exude into the water from one of the materials that would prove injurious to the minnows.

New cement exudes strong alkalis of a caustic nature that is capable of destroying the fins of fishes. For treating a cement trough holding about 350 gallons of water, the trough should be filled with water and two pounds of glacial acetic acid added to the water. This solution should be left in the trough for several days giving it time to neutralize the new cement. The trough is then emptied and thoroughly scrubbed out. Another method is that of filling the trough with water, letting it stand for several days, draining the water out, scrubbing the trough, again refilling and repeating the above procedure.

New wood, on the other hand, can exude acids that might be harmful. Wooden troughs can be painted with an asphaltum paint, then filled with water which is left in the trough for several days for curing purposes, then drained and scrubbed well after which they will be ready to hold minnows. New wood can also be cured by holding water in the trough for several weeks.

New galvanized metal is capable of killing fish and they too can be treated by painting them heavily with asphaltum paint.

Holding troughs should be at least 12 feet long, 2 feet wide and 14 inches deep. Screen lids should be provided to prevent the minnows from jumping out.

Water for holding troughs should be obtained from an unpolluted impoundment, stream, spring or well. Practically all city water is treated with chlorine and since very low concentrations of free available chlorine in water can be toxic to fish, it is advisable not to use water from city water supplies. It is true that if water containing free avail-

able chlorine is permitted to stand for 24 hours, the chlorine will dissipate and the water can then be safely used for holding minnows, but to hold minnows in a trough, water must be constantly run through the trough to provide ample dissolved oxygen for the minnows' breathing requirements and therefore a circulating water system must be provided. A closed circulation system may be found to be detrimental, due to a possible build-up of parasites that will be retained in the trough, rather than washing them away as was previously pointed out in describing "Ich."

Before leaving the discussion on troughs it should be mentioned that troughs should be kept extremely clean to avoid possible minnow loss by disease. The best possible breeding place for fungus is a dirty trough. If minnows are fed while in a holding trough, the uneaten food should be removed after an hour. Holding troughs should be sterilized and scrubbed out thoroughly at least once a week.

Probably the best sterilizer to use is calcium hypochlorite, which carries various trade names, one of which is "HTH." About 0.024 grams of this chemical added to each gallon of water in your trough

should be sufficient. In order to ascertain the number of gallons of water in your trough the following equivalent is offered. A cubic foot of water contains 7.48 gallons. To help compute the amount of chemical to use, 28.35 grams are equal to one ounce or 453.6 grams equal one pound.

TRANSPORTATION

The transportation of our hatchery fishes has caused the hatchery personnel to try out many and sundry devices in the attempt to achieve better methods of transportation. The best method that has been tested and the one in current use consists of a box constructed out of galvanized sheet metal that has two electric stirrers or agitators attached. A photograph of the box is shown along with the photographs of agitators. The agitators are run by six-volt motors that operate from the truck battery. Shown in the photograph are two insert boxes that serve to separate the different species of fishes being hauled or to keep different orders separated. Four such insert boxes are used.

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Schertz Club Members Complete Projects

Among the state's more active outdoor organizations is the Schertz Sportsman's Club at Schertz. Its 170 active members meet the fourth Tuesday of each month for a program, which usually is centered around a wildlife movie.

Allan Biegert, president, reports that the club currently is planning to sponsor a Boy Scout troop. Projects completed by the outdoor organization include a rifle range, clubhouse, picnic grounds, and barbecue and fish fry grill.

Other officers are Howard Schneider, vice president, and Kenneth Schultz, secretary-treasurer.

Dallas Plans Outdoor Show

The annual Dallas Sports and Vacation Show is slated to run this year from Friday, April 15, through Sunday, April 24. Attractions in addition to extensive exhibits of outdoor equipment and vacation spots will be daily stage shows and the Texas Game and Fish Commission's traveling exhibit of live Texas fish and game.

Ray Osborne, in charge of special promotions for the Dallas *Morning News*, sponsor of the show, says more national tackle manufacturers will have displays this year at the Dallas show than at any other in the nation.

Much of the stage show will feature acts related to the outdoors,

such as logrolling and canoe tilting contests. One of the top attractions will be Swede Fuller and his five famous golden retriever dogs, performing both in water and on the stage.

Featured with the general vaudeville-type acts will be Vernon, Bumpy and Company, one of the nation's top balancing teams and a favorite with Ed Sullivan's "Toast of the Town."

Over 150,000 persons have jammed the Automobile Building of the State Fair Grounds in each of the past three years to see the Dallas outdoor show.

Fleshy Fruits Attractive to Birds

Continued from page 17

small fruitlets are eaten by several well-known species native to this area.

Widespread over the county and important to birds as food is the French mulberry. In some places, it also forms thickets for nesting and cover habitat. It grows in almost any type of soil, and its fruit is popular with several Trinity County residents.

A common tree of Trinity County, sparsely scattered but growing in any

type of soil, is the persimmon. Although seventeen species of birds have been observed eating its fruit, the actual number of birds feeding on it is unknown.

The juniper or cedar is also sparsely scattered over the county in dry soil. Important to birds as food, escape and nesting cover, its thick evergreen and fruit constitute ideal winter shelter for many birds.

Another sparsely-scattered shrub, important to birds as food, is the swamp privet. The foliage is not thick enough to provide good cover, but some birds use it as nesting habitat. Growing along creek and river banks, where there is sufficient moisture for rapid growth, it has 65 birds eating of its fruit.

The nut of the ironwood, a tree 20 to 30 feet high with long, slender branches and very tough branchlets, is relished by several colorful birds here. The tree is found in dry, gravelly slopes and ridges, often in the shade of larger trees.

A vine-like plant which is abundant in fields and waste places throughout the county is the passion flower. Its fruit is an edible berry as large as a hen's egg.


The palmetto, a shrub about 5 feet high with fan-like leaves from 2 to 3 feet wide, with smooth, straight stems, is found in the rich bottom lands and in sandy swamps. Fruits ripening in July are relished

by birds of several varieties.

A woody-stem vine that clings to walls, fences and trees by tendrils, the Virginia creeper is known for its three to four-seeded black or dark blue berries of which more than a few birds are fond.

The prickly ash is a tree or shrub from 6 to 30 feet high which grows in rich lands over the entire county. Several birds relish its fruits, which ripen in May and June in dense clusters.

Very poisonous to stock but important to birds as food, the nightshade grows wild over most of the county's vacant spaces. It is a peren-



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nial weed, coming up from seed year after year, and its fruit provides food for some of the important birds in Trinity County.

Confined to rich, moist soil along fence rows, margins of fields, uncultivated lands, creek and river bottoms is the pokeweed, its growing period from spring until frost makes it an important plant for birds in the summer.

Forming thickets over the entire county, the prickly vine of the smilax, or stretchberry, provides almost year-around food, cover, nesting and resting habitat. Its berries are relished by 43 species of birds in the United States, several of which are important to this area.

An evergreen herb that is valuable the entire year as shelter, food and nesting cover is the wax myrtle. It is confined to rich, sandy loam, and forms thickets in the right kind of soil. Approximately 75 species of birds are fond of its grayish-white clusters of fruit.

About six different types of grapes, all important to birds for food, cover and nesting purposes, grow in Trinity County. Their easily-cultivated vines may be found twined about on fences, in trees, and over the ground, even forming thickets in places. Scores of birds feed on this popular fruit.

The hackberry tree is important to birds as food and shelter. It grows in sandy soil over the entire county, making its tiny fruit available to 47 birds from September to May.

Small white berries of the poison ivy are relished by a number of birds. The poisonous vine grows wild all over the county in all types of soil.

Common in rich woods and sandy loam, the wild cherry is important to birds as food and cover. Over 75 birds are known to feed on this one-seeded fruit, which grows from June to October. Among them are some important ones in Trinity County.

The wild rose is rather scarce, but is easily grown. It makes excellent cover for birds because of its thorny habit, and also forms heavy thickets once it gets started. It grows almost anywhere in rich soil, with preference to sand. Thirty-eight species of birds feed on its fruit, or "hips" in

the United States, and some in Trinity County.

There is only one species of mistletoe in Trinity County. A parasitic evergreen found on the trees of black jack, live, red, and post oaks, it has brittle stems which offer little cover for birds. But its white berries are attractive to at least 63 birds.

An interesting observation here is that the sticky flesh of these berries adheres to the feet and beaks of the birds, thus transferring the parasite from one tree to the next.

The mandrake or May apple is quite common in the county in moist, shaded soil. This plant is a herb with fruits the size of a small lemon. Although the tree has poisonous roots, its fruits have been observed eaten by a number of birds.

A tree 40 to 50 feet high, with a trunk 1½ to 2 feet in diameter, the wild china is restricted to river bottoms and ravines where there is plenty of moisture for rapid growth. It is important to birds for both food and cover.

Honeysuckle is a climbing shrub, whose fruits ripen in September and remain on the branches until the following spring. Birds fond of this fruit number 18.

A tree 20 to 35 feet high, with a trunk rarely more than one foot in

diameter, the wild plum bears fruit which ripens in June, and is eaten by approximately 58 birds, several of which are natives of this county.

The sassafras grows in rich, sandy, well-drained soil in the creek and river bottoms of Trinity County. It forms a tree 30 to 40 feet high, with a diameter of one to 1½ feet. Ripening in September and October, its fruit is eaten by 18 known birds in the United States, several of them in Trinity County.

Gum elastic grows along streams and in sandy soil, forming a tree 20 to 30 feet high, with a trunk five to six inches in diameter. Approximately 25 birds relish its fruit, which forms on slender, drooping stalks ripening and falling to the ground simultaneously in the fall.

A tree 80 to 100 feet tall with a trunk three to four feet in diameter. the tupelo gum is confined to the deep swamps of Trinity County. Fruits ripening in the autumn are eaten by several important birds there.

The partridge or twin berry is a small, smooth, trailing evergreen vine with small, rounded leaves that creep about the base of trees in the dry woods. Its small, round, bright red berries with white flesh are eaten by at least 15 species.

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A number of states are now giving high priority to the problem of providing public access.

production. In waters where insects are few, good production is possible, nevertheless, because the main food chain (for desired species) is microscopic food to shad to crappie and black bass or white bass.

Despite the constant increase in numbers of reservoirs, insufficient fact-finding effort goes into these waters. Research might well point the way to improved fishing in some reservoirs which now provide poor angling.

Usually, the success of a reservoir for fishing hinges on the condition and fertility of the watershed. If the silt is kept on the land, and out of the water, the chances for having good fishing are greatly increased. Muddy waters don't provide good fish crops.

Where dams are installed and operated for hydro-power, flood control, or irrigation, the over-all management program should give proper consideration to the fishing interest. We know of few instances where such consideration is given. This may be due partly to our lack of knowledge regarding proper reservoir management from a fish production standpoint.

In effect, we are creating more fishing water when we provide access to waters which already exist. A number of states are now giving high priority to the problem of providing public access. This problem will increase as the population

grows, and as land values rise.

An owner who might allow limited public use, might install "no trespass" signs when that use increases considerably. Unfortunately, in any sizable group of anglers, we can expect a small number of them to have little regard for private property. These are the ones who clutter up the landscape with cans, paper containers, and other debris.

The alternative to free access is the buying or leasing of land and water by the state. It's a costly program in areas of high land values, but it will be even more costly as the population increases.

Some water supply reservoirs are open to public fishing, others are not. San Diego's water supply lakes have been fished for over twenty years, with no indication that the fishing was harmful in any way to the drinking water. The city has regularly charged a small daily fee, which pays for the enforcement of the sanitary regulations imposed.

Where water supply lakes are closed to fishing, as many of them are, the cause can generally be regarded merely as stubbornness on the part of the officials. They don't want to be bothered with public fishing. On municipal water supplies, sportsmen can demand that fishing be permitted, with sanitary regulations strictly enforced, and with the charging of a fee, if need be, to pay for the enforcement.

Some fishing waters are constantly being lost to the public by drainage, diversion of water, siltation, pollution, and posting. But others are being created. A number of states now have much more fishing water than they had a few decades ago because of the extensive farm pond and public fishing lake building programs. In some areas, too, fishing has been increased through the building of reservoirs used mainly for other purposes, and through public access programs.

In the face of constantly increasing angling pressure, the "providing-more-fishing-water" program is an extremely important one.

Disney Movies Now Available

Two of the Disney Academy Award True-Life Adventure films are now available to organizations and schools. They are 16 mm, sound, with color by Technicolor. Rental requests should be addressed to: Walt Disney Productions, 16 MM Division, Burbank, California.

Beaver Valley. Running time 32 minutes, rental \$10. Second in the True-Life series, this remarkable wildlife picture is an exciting account of community life and complete life drama of the beaver and his neighbors. The patient, skilful camera reporting by the foremost naturalist-cameraman takes the picture off the beaten path to eavesdrop on these wildlife creatures and catch them unposed and unaware. An exciting and fascinating picture to captivate the audience.

Seal Island. Running time 26 minutes, rental \$10. An authentic camera report of the life cycle of the magnificent Alaskan seal. Photographed on the great rookeries on Pribilof Islands behind the protective mists of the Bering Sea, this film shows how seals live, their group organization, motivation and development. The subtle humor achieved through the medium of the narrative and music, and the photographic excellence and the color all combine to make delightful viewing.



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Let's Get Acquainted

• Continued from page 16

vision had purchased about 20 mobile radios that could be used either on a spot location or in a warden's car. In 1951 twenty more mobile radios and four base stations permanently located were added to the network. At the present time the division has 41 base stations and more than 183 mobile radios. Two of these mobile radios are installed in Commission aircraft and 12 in Commission patrol boats.

The Law Enforcement Division now has effective coverage of the entire state of Texas with its short wave network. Airplanes operating at Victoria and Alpine have direct short wave connection with patrol units and base stations on the ground. Patrol boats on the gulf have direct contact with other patrol boats and with base stations on the shore.

To quote Warden Bowers, radio communications for the game warden has "as many uses as scotch tape." Bowers said that he felt that the psychological effect that radio

Lubbock Schedules Annual Sports Show

The 2nd Annual South Plains Sports Show will be held April 28-29-30, May 1, Fair Park Coliseum in Lubbock, Texas.

The 1954 South Plains Show was acclaimed by sportsmen, exhibitors, newspapers, radio and TV stations as an outstanding success. This year's show will be better, and all major commercial and educational exhibits will be under one roof. In addition to this, spacious parking will be provided.

There will be prizes, and sporting goods valued at \$2,000 will be awarded during the term of the show, while the best in professional and amateur entertainment is scheduled.

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communications had on the potential law violator was one important function of the radio system of the division. The man who has in mind headlighting a deer or netting fish illegally will think twice about it if he knows that the district game warden can flick the switch on his radio and call for assistance in apprehending the law violator.

The Law Enforcement Division of the Texas Game and Fish Commission is now in a position to protect wildlife in Texas' 254 counties. In conjunction with the Wildlife Restoration Division, the Inland Fisheries Division, and the Marine Fisheries Division it can be instrumental in enforcing laws that will help restore game and fish populations to the plains, woodlands, mountains, streams, lakes and coastal waters of the state. In addition, since its wardens are close to the people in their district, it can be a moving force in informing the public on the policies of the Texas Game and Fish Commission, and the reason for these policies.

The age-old idea that arrest and conviction is the only function of the game warden has now been laid to rest in Texas. "The Texas game warden must arrest a violator who willfully disobeys game laws set up by the Texas Legislature, and must bring the individuals responsible for the violation to trial," says Captain Earl Sprott, director of the Law Enforcement Division, "however, this function of the warden is no more important than the promotion of the educational activities of the Commission in the warden's particular district."

Sprott points out that the rigid enforcement of game laws is necessary because the law becomes worthless unless it is enforced. "However," he says, "we must realize that in addition to enforcing laws the Texas game warden must serve as a protector of the fields and forest, streams and lakes, rivers and coastal waters of Texas; as well as the many non-game birds helpful to agricultural life, and many other fish and wildlife not specifically protected by law. This he does by the process of informing the people in his district of

Worth Repeating:

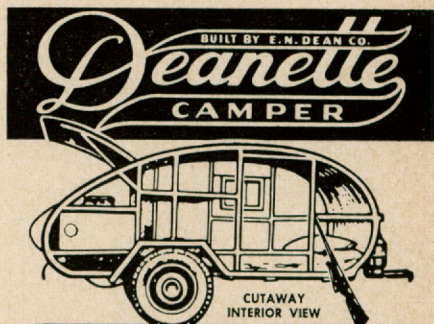
We can remember when sportsmen knew the answers. Today they are seeking them. It's an extremely important change.

Dr. R. W. Eschmeyer
In the Bulletin of the
Sports Fishing Institute

The management techniques for fresh-water fish developed by Dr. Eschmeyer have been credited with creating the fabulous fishing in the T. V. A. lakes. And his popular writings quite likely have been the most important single factor in the growing trend among the nation's sportsmen to "listen" to their trained game and fish biologists and technicians.—Ed.

the policies of the TEXAS GAME AND FISH COMMISSION and the reasons behind these policies. Good law enforcement is good conservation practice."

"In truth," said Sprott, "the most important function of the department game warden is that he be a builder in his community. He must handle the public tactfully, but he must impress upon them the necessity for their strict compliance with Commission game laws. He must also direct their efforts in wildlife conservation in the right channels. He is a practitioner in many fields, and not the least of these fields is that of being a human being."



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BOOKS



CARTER'S MAP AND COMPASS MANUAL by Jackson L. and A. E. Carter. 138 pages generously illustrated with line drawings. Published 1954 by Carters Manual Co., P. O. Box 186, Estacada, Ore. \$1.50.

This amazing little pocket-sized booklet must surely have taken a lifetime to compile, and at \$1.50 per copy the buyer surely will profit more than the authors.

The kind of information crammed into the booklet won't be found in any textbook on surveying, map making, or navigation. Yet here are practical, usable instructions—the kind the general outdoorsman can value—combining all three.

A must for anyone who has wanted to know more about the practical outdoor uses of compasses and maps.

THE FISHERMAN'S HANDBOOK edited by George H. Fichter. 512 pages generously illustrated with photos and drawings. Published 1955 by Fisherman Press, Inc., Oxford, Ohio. \$1.25.

The first annual edition of this series, published in 1954 by *The Fisherman Magazine*, was good. The 1955 edition is superb.

A partial listing of the subjects covered in this big book, plus the notation

that all phases are covered in detail and authoritatively, should give some idea of the book's value.

Partial contents: Fish and fish biology, including descriptions and drawings of many salt- and fresh-water species. Natural baits for fresh- and salt-water. Where to fish, with charts for all states. Fishing methods, including instructions, knots, and special rigs. Tackle. Boats and motors. Numerous miscellaneous subjects, plus charts, tables, records, and diagrams.

AN INTRODUCTION TO TREES by John Kieran. 77 pages with 100 full-color illustrations. Published 1954 by Hanover House, 575 Madison Ave., New York 22, N. Y. \$2.95.

This handsome guide book contains illustrations of 100 trees in full color by Michael H. Bevans, as well as Mr. Kieran's observations of trees and shrubs from all sections of the country.

In this book will be found many trees and a few of the shrubs that so often meet the eye along the city street or down the country lane. The author writes of distinctive identifying features, such as the bark, leaf, flower, or fruit.

AMERICAN GAME BIRDS OF FIELD AND FOREST, by Frank C. Edminster. Published 1954 by Charles Scribner's Sons, 597 Fifth Avenue, New York 17, New York. \$12.50.

This is the definitive book on American game birds. The author devotes a complete chapter to each species, tracing therein their origin and history; their geographic range, their eating, courting, and nesting habits; their relationship with man, and finally, a complete section on management and conservation techniques and requirements.

The treatment of the life histories is in language suitable for the general reader of natural history.

This big, handsome book is well illustrated with photographs and line drawings.

FAVORITE FLIES AND THEIR HISTORIES by Mary Orvis Marbury. The Charles T. Branford Company, 551 Boylston Street, Boston 16, Massachusetts. 520 pages, 32 color plates. \$15.00.

This is a good re-issue of a famous outdoor classic. It was written for generations of anglers years ago but it is as valuable and fascinating a volume today as it was when it was first compiled by the daughter of an early American fly-tier.

"Favorite Flies" is a reference history of 291 patterns of flies, all illustrated in full color. Adding value to the book are dozens of revealing letters from successful fishermen from all over the country, including the old master, Dr. James Henshall.

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A NEW SET OF

TEN COMMANDMENTS OF FISHING

By LORRAINE BASSFORD

The Palacios Beacon

1. Thou shalt not let thy zeal for a fishing trip awaken thy household at 3 o'clock in the morning to prepareth thyself. If thee must ariseth so early, moveth quietly.

2. Keepeth thy fishing equipment in good condition.

3. Thou shalt not request the lady of thy heart to prepareth ambrosia or a hearty breakfast for thee. Prepareth it thyself, or stoppeth at an all-night cafe.

4. Thou shalt not utter profane words if thee discovereth an airless tire on thy means of transportation. Be thy own man Friday, and repaireth it thyself.

5. Driveth not like a demon to a bait camp, or to the fishing spot of thy choice.

6. Shouldest thee entereth others' property, remembereth it is their kindness that permitteth thee to do so. Leaveth not an untidy spot, and closeth all gates.

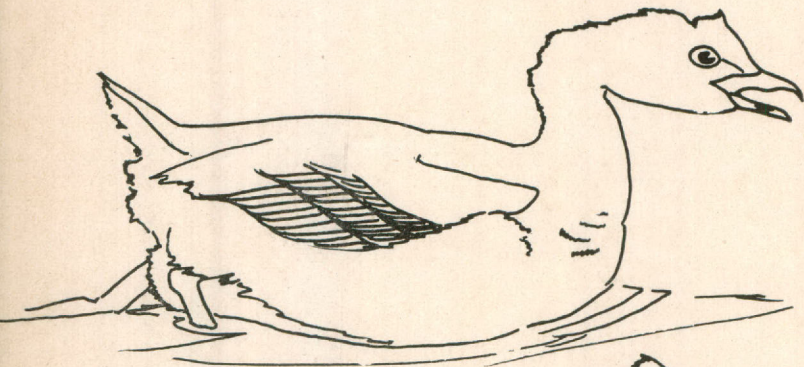
7. Casteth thy line into the water. The hook on thy line is to hooketh fish, not the ear, arm or garments of those nearest to thee.

8. Useth thy good judgment if thou seest foul weather coming.

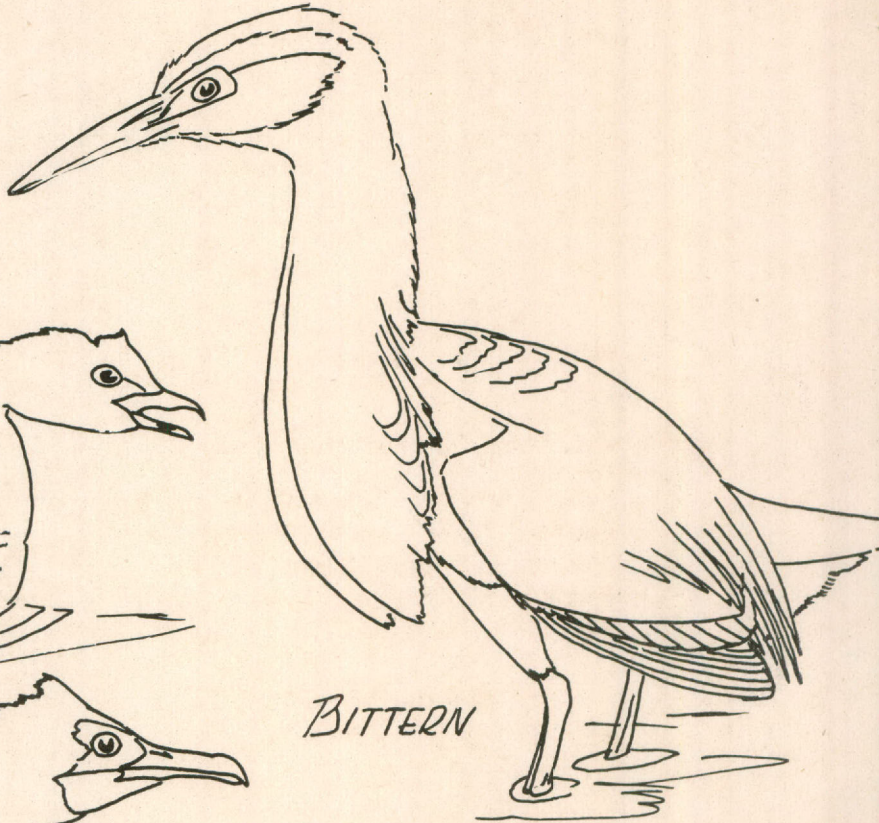
9. Thou shalt speaketh the truth when thy day of fishing is over.

10. If these commandments thou obey, thou shalt have a pleasant day.

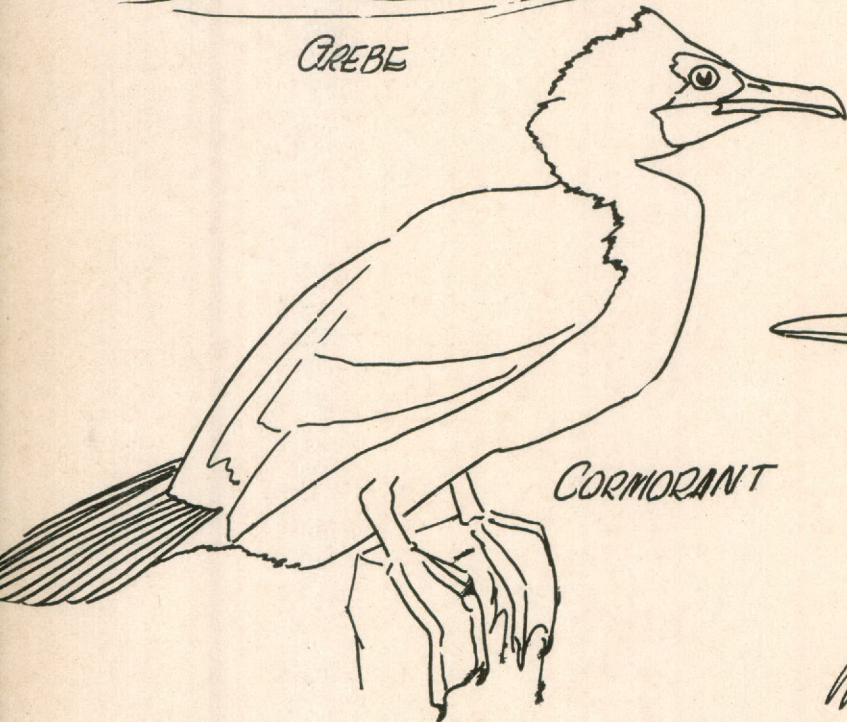
PREDATORS OF FISH



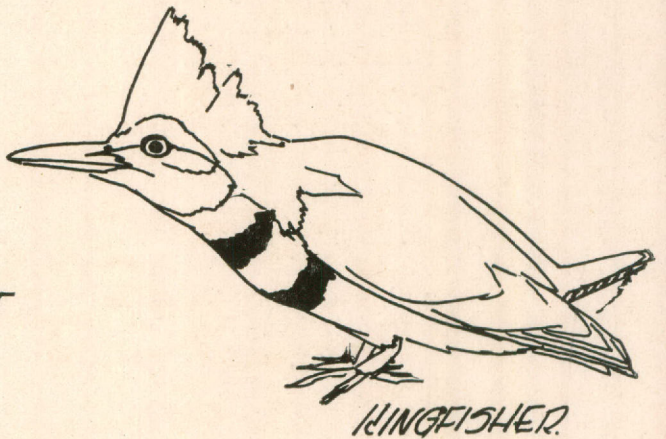
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