



**KANSAS**  
FISH & GAME



J. HARTMANN

1966

## Have You Recently Sold Your Boat?

The Kansas Forestry, Fish and Game Commission reminds all boat owners that, when you sell or trade your boat or ownership changes, you must notify the commission within fifteen days. All that is required is a short note stating that the boat has been sold and what number was issued for the vessel. Also, the certificate of number must be sent in at that time.

It has come to the attention of the boating division that several boat owners have failed to notify this department when change of ownership has occurred. In some instances boat owners have used their old number on a newly acquired boat. This is in violation of the law. The state boating act specifically states that when a registered boat is sold or ownership changes, the certificate of number is terminated and may no longer be used, either by the new owner or the prior owner should he acquire a new boat.

Fred Warders, assistant director and chief of the law enforcement division, states that game protectors will be checking for violations of this nature. Therefore, persons who have sold boats in the past and who have not notified the commission should do so immediately so that records can be cleared. Warders also points out that the law is not designed to place a hardship on boat owners; the purpose of this section of the law is merely to help in keeping the registration files current and accurate.

It is hoped that all boat owners will observe this requirement of the law. Those who do not will be subjecting themselves to a court appearance and a possible fine.

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# Kansas' First Deer Season

By BILL PEABODY

It all started just a few years ago. Kansas, the last of the states to have a deer season began to make preparations for the inevitable. In 1956 it was estimated that there were 3,000 deer in the Sunflower State, and by 1965 this small population had mushroomed to an incredible 30,000 plus animals. If we add to this the fawn crop of last spring, it can be conservatively stated that there were at least 35,000 deer in "Midway U. S. A." last fall and

*more than 22,000* in the management units open to firearms hunting. Deer management in Kansas has been tempered with the experiences of other states and is based on a basic knowledge of the animal and its interaction with Kansas habitat.

## The Beginning

If any one man deserves credit for getting the ball rolling, it is Leland M. Queal. Lee came to work for the commission in 1963.

A professional biologist, he took charge of the deer project and began planning, evaluating and initiating surveys to find out "WHAT, WHERE, WHY and HOW MANY?" Some of you may remember Lee from his story "Our Kansas Deer" which appeared in the Winter 1964 issue of KANSAS FISH AND GAME. He set course for a deer season in 1965, but left the state in May to take a job in Michigan and was not present when the first arrow was



drawn and the crack of a rifle echoed the presence of a deer hunter in the next draw.

#### Objective

In terms of the commission's objectives in establishing a season, all were met with unqualified success. *This didn't just happen — it was planned.* The 1965 deer season was the first step in the initiation of control measures to maintain a fast growing deer population within the economic limit tolerable to landowners and to provide some relief in the deer-car accident rate. Last year, a total of 562 deer were killed on Kansas highways as compared to 456 animals in 1964. In all, 696

known mortalities occurred. Just how significant is this? If we add together the archery deer kill (160) and the firearms harvest (1,340), we get a total 1965 legal harvest of 1,500 deer. This, by the way, represents only about 4 percent of the total deer population in the state. Nonhunting mortalities amounted to 46 percent of the season's harvest. This is a considerable loss in terms of potential hunter recreation, vehicle damage and personal injury, and wasted venison.

The season also provided recreation well within the limits of our deer resource. It *did not* provide the control that will become neces-

sary in the future. It did provide, however, the first step toward reaching that goal. Successful hunters were required to take their deer to a check station. At the stations, commission personnel went about the business of determining the sex and age of each deer, taking weights, determining hunter success, distribution and hunting pressure. In addition, blood samples of usable quality were collected from almost 800 animals as were over 200 reproductive tracts from antlerless deer. You might ask, just how is all of this information collected at the check stations being used? Until last year, the commission's knowledge of the sex



Game Protector Clyde Ukele, Norton, displays rack of deer taken during firearms deer season. The deer is being weighed at a check station.

and age structure of our deer herd was based largely on surveys conducted by biologists and state game protectors. We did not know what Kansas deer weighed, although road kills and estimates told us that most of our deer were fine physical specimens. We did not know if our deer were carriers or reservoirs of dreaded livestock diseases. When testing is completed by the Diagnostic Laboratory, Kansas State University, we will have the answer.

We know that Kansas deer are reproducing at a high rate, but just what is the rate of reproduction? By examining the female reproductive tracts turned in at the stations by cooperating hunters, we can tell how many fawns are being produced each year by various age

classes of does. If, as we suspect, many of our fawns are breeders when they are only six to eight months old, this will tell us that our deer population has the potential for tremendous growth. This information, when used in conjunction with yearly population trend data, hunter success, distribution, and hunting pressure information in the various management units, will enable the game division to make realistic season recommendations without endangering the future of this valuable wildlife resource, while at the same time providing maximum hunter recreation.

#### What Kind of Seasons

Actually, there were four seasons in one. A liberal 46-day archery season that began in October en-

couraged 1,220 bow hunters to take their chances in bagging a deer. And wouldn't you know it, two of these modern-day Robin Hoods bagged a pair of the largest white-tails taken in the state. Al Weaver of Wichita brought down a buck that field dressed at 300 pounds. Al, using a 72-pound bow, got his trophy on the Arkansas river several miles south of the city. Hugo Prell, a resident of Bremen in northwest Marshall county, bagged a buck that tipped the scales at 241 pounds. Archers killed 160 deer during the season for an overall hunter success of 13 percent. This is pretty fair shooting when one considers that many inexperienced newcomers were in the field after the buckskin for the first time. But, more important than the number



Archery deer hunting is difficult and the hunter must blend with the surroundings. Here an archer uses a tree stand.

of deer taken was the tremendous amount of recreation that the season provided for those who took the time to scout the woods looking for deer and deer sign and then, wait patiently in a blind for that "big one" to come by. As predicted by Queal when he prepared the 1965 recommendations, the highway deer kill in "65" far exceeded the legal harvest by archers.

In six management units where it was desirable to stabilize population levels in order to control increasing crop damage and highway deer kills more adequately, or where hunting was more difficult due to local habitat conditions, both antlered and antlerless deer were legal targets throughout the season. Instead of increasing the harvest of deer as this type of season is intended to do, hunters bagged fewer deer in the eastern part of the state where these regulations were in effect than in the north central and northwestern units. And, the eastern areas are where the bulk of Kansas' white-tailed deer population is found. The commission issued 1,281 permits in the "any deer" areas and hunters took home 296 deer for a hunter success of 23 percent. This figure is less than half

of the statewide accidental deer kill for 1965. This lower hunter success can be explained in terms of the species of deer hunted (whitetail), more difficult habitat to hunt in, general accessibility, difficulty hunters experienced in finding a place to hunt, and inexperience on the part of many.

The white-tailed deer is by nature a more secretive animal than his cousin the black-tail or mule deer. "Mr. Whitetail" is just not as easy to bag as the more open ranging, less wary "muley." Hunters experienced difficulty in finding this elusive creature of the wooded streams, valleys and upland timber. And when they did see him, all many saw was his white "flag" mocking them as he bounded off gracefully out of gun range through the thickets. Or maybe he just outsmarted them by staying put or circling around behind.

Throughout eastern Kansas there was concern over the type of firearm that would be used to hunt deer. Time and time again, facts and figures from the National Rifle Association and statistics from surrounding states were offered in evidence that the rifle was a safer weapon than the shotgun. And it

didn't matter what weapon was used, it was the person behind the trigger that counted. Hunters had the choice of using either rifles or shotguns at the option of the landowner on whose land they would hunt. Over 98 percent of the successful hunters (1,318) preferred to use rifles to bag their deer. Only 22 deer were taken with shotguns. Still, fear of the high-powered rifle prompted some landowners to close their land to hunting. The excellent sportsmanship, caution, and attitude displayed by Kansas deer hunters in 1965 should pave the way for another accident free year in 1966, and who knows, it may open more land to hunting now that Kansas residents have been assured that deer hunting under a limited permit system can be safe as well as enjoyable.

The third type of season authorized the harvest of antlerless deer on the last day to previously unsuccessful hunters. This type of regulation was initiated to exert some control over the population, but certainly *cannot* be used as a stabilizing measure. Three management units offered antlerless deer hunting on the last day and 1,698 permits were issued. Hunters harvested 612 deer for a hunter success of 36 percent.

Wisely, in selecting the type of season for the northwestern management units (High Plains and Smoky Hill), Queal chose "bucks only" hunting because the deer population was composed primarily of mule deer which are much easier to hunt than whitetails and the more open nature of the habitat allows almost unlimited hunter access to the deer herds. In addition, there were some areas where it was considered desirable to allow the population to grow unchecked. It has been proven many times that under "bucks only" regulations it is virtually impossible to remove any more than about 10 percent of the total deer population. "Bucks only" hunting was authorized in three units and 946 hunters bagged 431 deer for a 46 percent hunter suc-

cess. This very good success in the extreme western units is not indicative of a high deer population, but reflects the habits of the species hunted (mule deer), the method used in hunting, and accessibility as related to habitat. It pleases me to add that hunter-landowner relations were excellent—in fact, some landowners actually took the time to show hunters where the deer were.

**Results of Seasons**

Looking back, the firearms deer season went just about the way it was expected to go. All of the 4,575 permits authorized by the commission were not issued, but still there were approximately 3,925 hunters afield. Permits were issued on a drawing basis with 4,264 applications being received. You might ask then, since the number of applications did not exceed the quota of permits available, why didn't everyone get a permit? The answer is straight and simple. As long as it is advantageous to control the number of hunters in a given area, and more applications to hunt there are received than there are permits available, some persons will be eliminated in the drawing or offered a choice to hunt in other units where the quota of permits has not been filled.

A glance at the kill figures tells us that there was quite a bit of hunter selectivity. Bucks accounted for 80 percent (1,073) of the total harvest even though antlerless deer were legal in six management units throughout the season and in another three units on the last day. As is evidenced by the increase in the kill on December 15, unsuccessful hunters not bagging a buck early in the season probably waited until the last day to take a doe. This is not surprising—with an unharvested population containing many old patriarchs with trophy antlers—who wouldn't want to wait for a big rack to come by.

Commission personnel determined the age of deer by tooth replacement and relative wear. Some hunters may have wondered why the station attendant removed the lower jaw with his consent. This was done so that a more detailed examination could be made at a later date and would also tell us how well our own men were trained in the deer aging technique. As was expected, a large proportion of the harvest was made up of old deer. In fact, 55 percent of the deer bagged were 2½ years old and older. Thirty-two percent were yearlings (1½ years) and 13 percent were fawns (½-year class). In 1966

it is expected that the proportion of older deer in the harvest will be reduced, but those of you that may think that all the "big ones" are gone, just get out into the "deer country" and take a look for yourselves. While it is true that as Kansas continues to hunt deer each year the number of older deer bagged will decrease, there will always be the challenge of finding that "Ole Granddaddy" to mount and hang over the fireplace or in a den.

Frequently we have been asked, what do Kansas deer weigh? For the first time we can give accurate "no-guess" answers. Field dressed weights were obtained on 1,213 whitetails and mule deer. Surprising as it may seem, whitetails weighed more than the "muleys" except in the fawn and 3½-year-plus classes. Without exception, antlerless white-tailed deer weighed from 9 to 60 pounds less than bucks. In mule deer, does averaged from 9 to 73 pounds less than antlered deer. Mule deer does appear to be slightly heavier than antlerless whitetails, although the small sample size for mule deer weights does not permit us to make a more refined statement. Average weights for whitetails and mule deer are

*(Continued on page 11)*

**Average Weights of Deer in Kansas**

Age class	WHITETAILS		MULE DEER	
	Males	Females	Males	Females
½.....	(77) 75.4*	(59) 66.7	(7) 76.4	(10) 67.7
1½.....	(174) 123.6	(55) 92.9	(132) 114.6	(12) 101.7
2½.....	(118) 153.2	(42) 108.6	(98) 146.7	(9) 111.9
3½.....	(82) 173.3	(16) 119.4	(99) 170.0	(5) 123.0
3½ plus.....	(91) 178.3	(19) 118.1	(106) 179.6	(2) 107.0

\* (No.) = sample size. Average field dressed weights in pounds.



Game Protector Alvin Ayers, Manhattan, and biologist Capel release wild turkeys in northeast Kansas. (Manhattan Mercury photo by Mike Robinson.)

## Commission Stocks Turkey, Antelope

The month of January was a busy one for the game division of the Forestry, Fish and Game Commission. Actually, every month is that way for all employees of the commission but there was something special about January, 1966. During this month several years of planning and negotiation were brought to a climax.

From the west and the south came trucks bearing cargos of a special nature. Colorado's eastern slope was the origin of two sepa-

rate shipments of antelope and the Lone Star State of Texas provided a big boost for the Kansas wild turkey population.

It all began several years ago when game biologists laid plans for projects involving the reintroduction of these two species of wildlife. Historically, Kansas had been host to large numbers of antelope and wild turkeys. With the coming of white man, these populations were rapidly depleted until none remained. In the case of antelope,

some suitable range was present. It was decided that an attempt would be made to establish the beginnings of a herd in these localities. As far as turkeys were concerned, most of the major watercourses in the state had suitable habitat adjacent.

In the fall of 1964, 76 antelope were released in the upper reaches of the Smoky Hill river in northwest Kansas. The release was made to the east of an area which already contained a few of the animals



which had crossed over the Kansas-Colorado line. These antelope were obtained from the state of Montana through the cooperation of the U. S. Fish and Wildlife Service. This was a beginning, but there still remained areas where it was hoped that antelope could find sufficient range for establishing a herd. Negotiations were begun with the Colorado Game, Fish and Parks department which resulted in the acquisition of seventy of these fleet animals.

The first shipment of 51 antelope arrived the evening of January 18. Trucks of the Colorado department were met at the state line and escorted to the release site in Barber county. 43 of the animals were released on the Davis ranch approximately twenty miles southwest of Medicine Lodge. The remaining eight antelope were transferred to a Fish and Game Commission truck and were taken to the Maxwell State Game Refuge in McPherson county. Two days later, 19 more pronghorns arrived from Colorado and the release was made on the Boggs ranch, a few miles from the first Barber county release site.

It is hoped that these herds will increase in size and repopulate adjacent suitable habitat. The goal of the antelope herd establishment is to allow Kansans the chance to observe antelope in the wild and set up conditions favorable to a limited hunting season at some time in the future.

The story of antelope in Kansas is a continuing one and the results of these efforts will be judged by time.

Turning our attention to wild turkeys, the historical range of the eastern wild turkey included most of Kansas at one time but it was definitely limited to the heavier timbered areas along rivers. Even when the area which is now Kansas was still the domain of the red man, the eastern turkey was an inconsistent producer in all areas except the extreme eastern portion of the state. With the settlement of the state the wild turkey disappeared; apparently he needed much more se-



**A little reluctant to leave the truck after a long ride from Colorado, this antelope needed a little encouragement from biologist Bill Hlavachick. (Pratt Tribune photo by Don Wright.)**

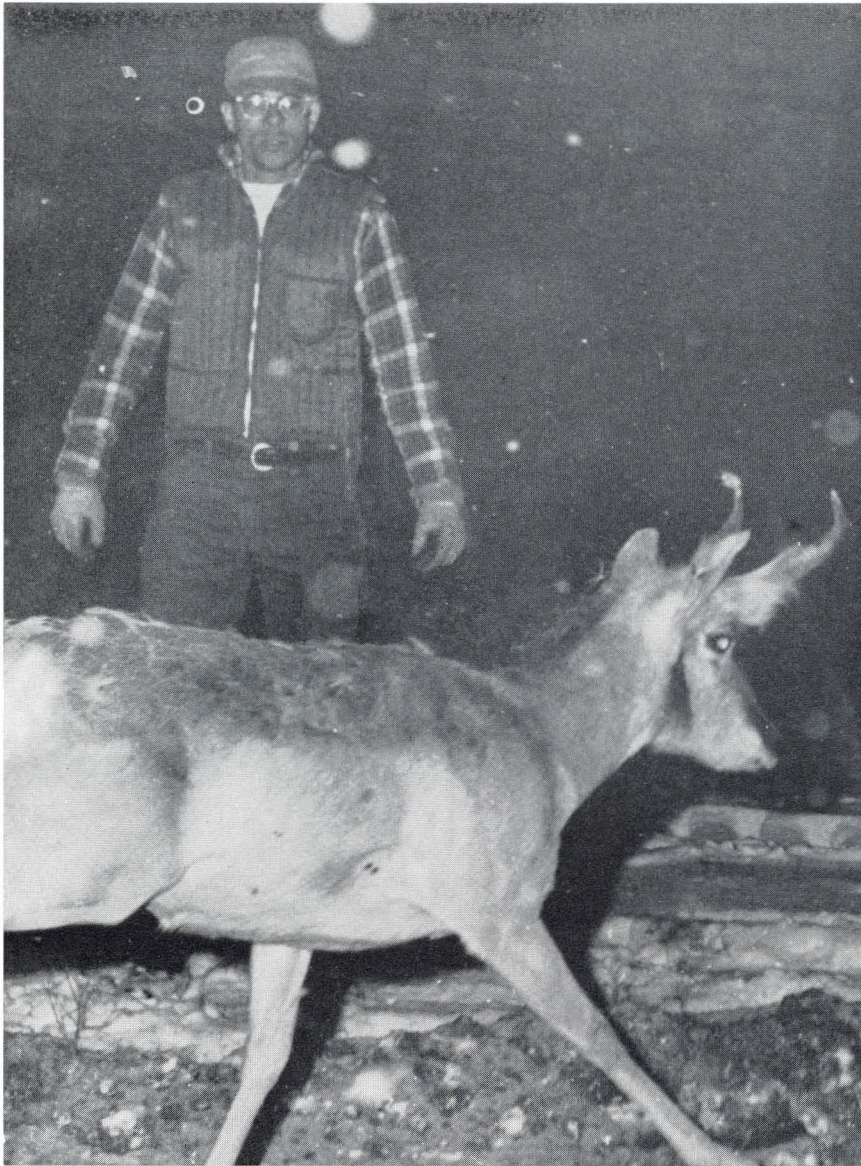
clusion in this more open cover than the invading white man gave him. However, when the turkey project was begun in 1961, no eastern turkeys were known within 150 miles of the Kansas border.

At the same time two other states, Oklahoma and Nebraska, had been having much success with other subspecies of wild turkeys. The Merriam wild turkey was thriving in the pine ridge area of northwest Nebraska, and Oklahoma was obtaining fantastic results with the Rio Grande bird. Rio Grande turkeys had also been introduced into Nebraska in 1959-60 and were more than holding their own. Since the Rio Grande turkey required habitat similar to that found in the river bottoms over much of the state, it was decided that this was the turkey for Kansas. This decision was also predicated by the fact that Oklahoma turkeys had invaded the extreme southern part of Kansas

and were apparently doing quite well in the tree covered bottom lands along the border. Because of this latter fact, there is room for much optimism for the future of the Rio Grande wild turkey in the Sunflower State.

Exactly one week after the last shipment of antelope from Colorado, 125 wild Rio Grande turkeys arrived by truck at the headquarters of the Kansas Forestry, Fish and Game Commission. The birds were wild-trapped on the King ranch in Texas and dispatched immediately to their Kansas destination. Banding and tagging of the birds began immediately and they were transported directly to the ten release sites previously selected. The sites were chosen well in advance of the turkey delivery and cooperative agreements were executed with the area landowners. The farmers agreed to permit the birds to be

*(Continued on next page)*



With heavy snow falling a buck pronghorn heads for freedom in his new home in Barber county. (Pratt Tribune photo by Don Wright.)

trapped for transplanting to other areas as the flocks increase. Also agreed to was the proposition that they would allow hunting on their land should there be a wild turkey season declared for that portion of Kansas.

Turkeys were released at the following locations: On Tuttle Creek Reservoir near Olsburg in Pottawatomie county, north fork of the Ninnescah river near Arlington in Reno county, Lovewell Reservoir in Jewell county, Oak Valley on

the Elk river in Elk county, south fork of the Solomon river near Bogue in Graham county, the Arkansas river near Alden in Rice county, on the Saline river in Ellis county, the Marais des Cygnes river near Boicourt in Linn county, the Chikaskia river near Argonia in Sumner county and on the Cimarron river in Morton county. Five of the birds were also used to supplement a wild turkey stocking made previously on the Arkansas river near Kinsley.

It is estimated that there were nearly 500 wild turkeys already in Kansas prior to the release of the Texas birds. Most of them are in the southern tier of counties along the Oklahoma line. The introduction and stocking is designed to speed the establishment of flocks all over the state and thus hasten the day when there will be enough to establish an open season.

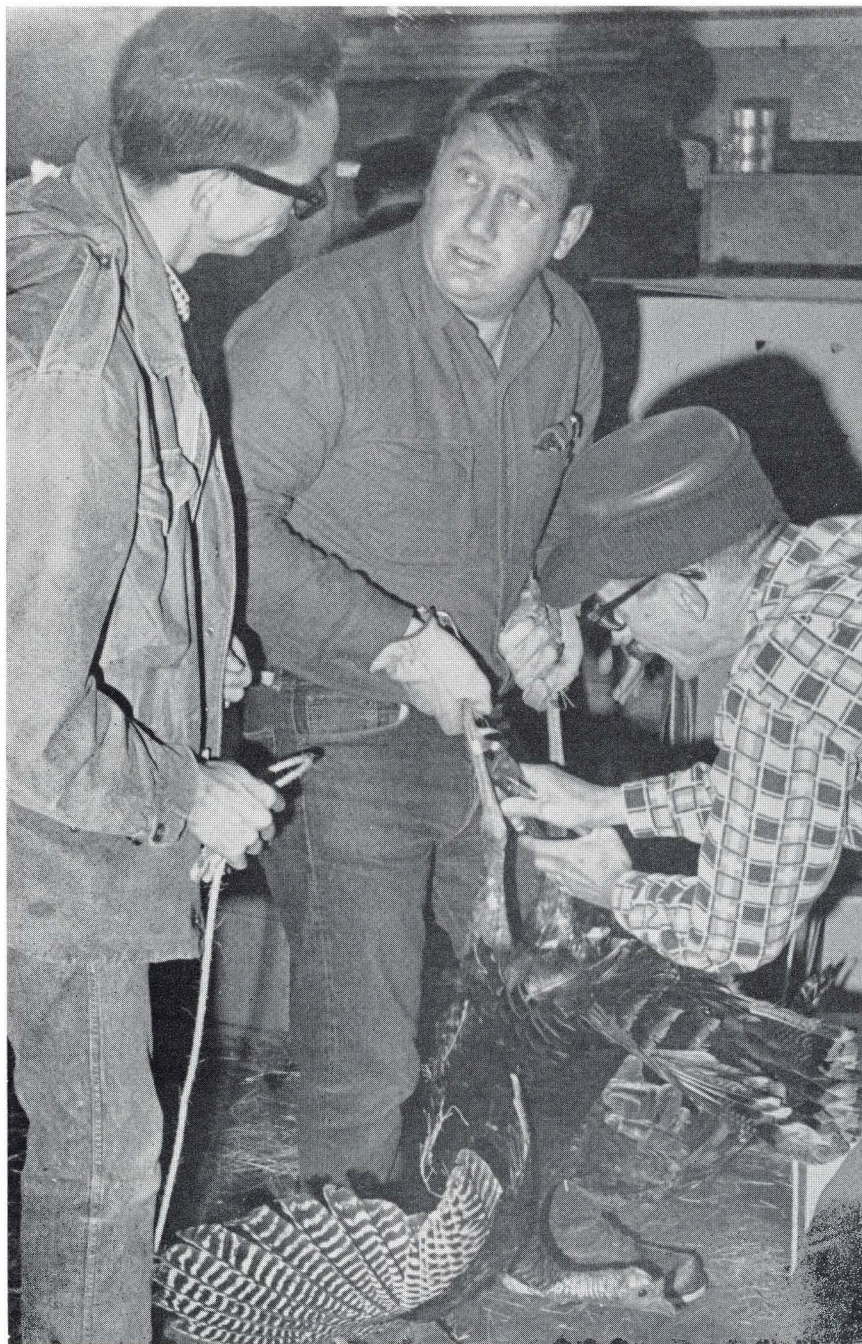
Kansas is now indebted to Texas and Colorado. In exchange for the antelope, the Fish and Game Commission will trap and send lesser prairie chicken and white-tail deer to our neighbors to the west. Kansas will also repay Texas with lesser prairie chicken and the first shipment of these birds has already been made. Wildlife agencies often arrange such trades where an agreement of this nature is to their mutual advantage.

It will be interesting to follow the progress of the antelope and turkey projects in Kansas. Who knows? Maybe one of these days hunters will be enjoying the opportunity of hunting turkeys in the wild or stalking an antelope in the Gypsum Hills of Barber county. If such a thing should transpire, we can look back to January of 1966 as the starting point and a big step in the right direction.

(Additional photo on page 19.)



Game biologists Steve Capel (left) and Bill Peabody load banded turkeys into truck for final leg of journey.



Larry Mull, Pratt assists game biologist Bill Hlavachick, Hays and Federal Aid Coordinator Oliver Gasswint, Pratt in leg-banding one of the wild turkeys. (Pratt Tribune photo by Don Wright.)

## Deer Season

(Continued from page 7)

given in the table below. The largest deer harvested during the firearms season was a whitetail buck that hog-dressed out at 235 pounds.

As one might expect, the bulk of

the deer harvest occurred on opening weekend with 710 animals being bagged. This represents 53 percent of the total statewide kill. A total of 375 deer were taken on December 15, the last day of the season, and amounted to 28 percent (375) of the harvest. This increase

in deer bagged can be explained by the fact that three management units offered a previously unsuccessful hunter antlerless deer on the last day. Also, as was mentioned earlier, quite a number of hunters in "any deer" areas waiting for a buck earlier in the season, took a doe on the last day to fill their permit. Although not bringing home a trophy buck might have been disappointing to some, hunters taking antlerless deer probably had better quality venison to set on the table than those that bagged a buck that had just been in rut or was still in the rutting condition.

Approximately 90 tons of hog-dressed venison was harvested this past season. Like good livestock management, the harvest of surplus deer on a sustained yield basis will provide Kansas hunters with many hours of recreation, and we hope for many, pleasant eating.

### Comparison

Just how well did the general resident fare as compared to the landowner-tenant in bagging a deer? Our statistics show that those hunters living on rural land came out slightly ahead of the general resident. Thirty-five percent of the landowners were successful whereas 31 percent of the general residents filled their permit. This could be expected, because persons living on rural land would have a better opportunity to see and locate deer, and certainly most would have no difficulty in finding a place to hunt.

From start to finish, Kansas' first deer season provided hunters with many thrills and unforgettable moments. The four types of seasons mentioned: (1) Archery, (2) "Any deer," (3) Antlerless deer on one or more days, and (4) "Bucks only," will form the deer management framework in "Midway U. S. A." Based on yearly population trend surveys, results of the previous hunting season, and common sense, each deer season can be as good, if not better, than the last.

# Wildlife and the Watersheds

By GEORGE VALYER



A scene from a newly completed dam in the Frog Creek Watershed District.



Water storage and fishing are the only direct benefits of this watershed dam. The absence of cover and food preclude much benefit to the general wildlife community.

Persons who have been traveling around the countryside in Kansas have become increasingly aware of something relatively new on the face of the land. During the past four or five years, many who have been out for a Sunday drive have noticed huge earth movers at rural construction sites or perhaps a large earth fill where once there was only a small creek or draw. If you ask the local landowners about this activity, they are proud to tell you that these are detention dams and that they are a part of a Watershed Program.

With the advent of so many projects of this kind, the thinking individual is bound to inquire as to the overall effect these areas may have on the recreation scene and, in particular, the effect they have on the wildlife resources of the community. Such questions have been carefully studied by an agency of the state, the Kansas Forestry, Fish and Game Commission. Since it is their responsibility to look after Kansas wildlife, it is the duty of the commission to seek answers to these questions and to help in an advisory capacity with the planning of the watershed developments.

First, let us examine the basic purposes of the watershed program. This development has some basic goals which are certainly admirable and of great benefit to the people of the state. A publication of the Upper Verdigris Watershed Project states these goals concisely and clearly: "Watershed protection through an effective conservation program based on the use of land within its capabilities and treatment in accordance with its needs; flood prevention through the construction of floodwater retarding structures (detention dams); the control of erosion on croplands in the valley

due to overflow." This publication also explains that the Watershed District is an organization of the local people for watershed protection and flood prevention. The Federal Government, through the Soil Conservation Service, furnishes the engineering services and provides the money to cover the cost of construction for flood prevention measures. The local watershed organization furnishes the land rights and provides maintenance after the structures are completed.

With this background, we are now ready to review the recreation and wildlife aspects of these watershed detention dams. It should be noted that these watershed lakes vary in size from a few acres to nearly 100 acres in their permanent pools. The lakes already constructed also have a wide diversity of settings ranging from the oak-covered hills of Chautauqua County to the open rangelands of northern Greenwood County to the tree-covered valleys of northeast Kansas. This diversity naturally makes a difference in the types and species of wildlife found in the vicinity of these lakes.

Let us see what benefits can be chalked up to the existence of these watershed lakes. Perhaps the most apparent asset is the existence of additional habitat for fish and generally this habitat is of high quality. Due to the fact that soil conservation practices are carried out in the drainage area above the dams, the impounded water is relatively clear and provides good habitat for game fish. In most instances, these lakes are stocked by either the Forestry, Fish and Game Commission or the U. S. Bureau of Sport Fisheries and Wildlife as soon as sufficient water has been impounded. Some of the older lakes are now producing excellent fishing.

Another decided benefit to wildlife which is readily apparent is the attraction for migrating waterfowl. Ducks traversing the Central Flyway will find resting and loafing spots more numerous and may be more prone to spend extra time in

Kansas. In times of excessively dry weather when smaller bodies of water have dried up, these lakes will be especially valuable in maintaining waterfowl flights through a given locality. Certain upland game may also receive benefits from the existence of a permanent water supply.

But, there is a debit or minus side to the picture. In most instances, the construction of the watershed lakes has resulted in the loss of cover for game birds and animals. Since the bulk of the affected land is located in lowlands of creeks and draws where cover is normally heaviest, the destruction of this cover means a loss in the overall game populations of the community and, in most cases, no plans are in existence for the replacing of this lost habitat.

The most difficult and nagging problem associated with these new watershed lakes is the problem of access to persons who seek their recreation in the out-of-doors. With the existence of these water areas in a community, it is only natural that local fishermen and hunters desire to use them for their sport. Herein lies the difficulty. Although the dams are constructed with public tax money, nearly all the lakes are located on private lands. Easements are acquired from landowners for the construction but the farmer or rancher still has control over the land itself. Anyone entering upon the property is guilty of trespass unless he has first obtained permission to be there. Solutions to this problem are not easy and it will require much thought and effort on the part of both sportsmen and landowners to reach a fair and equitable agreement.

One watershed district has considered this problem and done something about it. The Delaware Watershed organization acquired title to the land for one of its larger detention lakes and has opened it to public use for fishing, picnicking and camping. This represents a realization of the needs for community recreation facilities and a fine

public relations effort on the part of the watershed district.

The attitude of landowners upon whose land the lakes have been built ranges greatly. Some of the farmers have indicated that they want no one outside of their family and friends to use the facility. Others have leased fishing and hunting privileges to groups of sportsmen. Others plan to sell or lease cabin sites next to the lakes. One other landowner contacted probably indicated an attitude which is shared by many others; he said, "the taxpayers money built this lake and I don't believe in being a hog. Anyone who wants to fish or hunt can do so if they come to me and ask. The only thing that will change my mind is for a bunch of vandals to tear up the place. If they do that, I may have to close it up."

Several things can be done to improve the valuable recreation and wildlife resource created by the construction of watershed lakes. Consideration for wildlife can be incorporated into the plans of the watershed districts. This would entail the replacement of habitat lost through construction and impoundment. This can be accomplished through adequate planning and a small outlay of money and effort. Sportsmen should be happy to assist a district in the development of these plans. This can best be accomplished through an organized sportsmen's club or service group. Through mutual understanding, progress can be made in solving the problem of access for persons interested in using the areas.

Another important aspect of development for wildlife is the complete fencing of the lake so that livestock will not have direct access to the area. Provisions for livestock watering can be included in the detention dam construction by providing piped water to a tank below. This will allow the growth of wildlife cover adjacent to the lakeside and prevent cattle from roiling the water.

*(Continued on page 16)*

# Common-sense Boating Rules

Most boating rules are just common sense. They have been established to insure maximum safety afloat, and, when correctly followed, they even add to the fun of boating.

Whether you're a newcomer or seasoned skipper, an occasional review of the basic rules is a good idea. Here's a guide prepared by the Evinrude News Service. It's also smart to check additional regulations on the lake where you plan to do your boating.

**Meeting** — When two boats approach head on, each skipper steers to the right or starboard and the boats pass port side to port side.

**Overtaking** — When one boat is overtaking another, the slower boat has the right-of-way.

**Crossing** — Similar to automobile regulations, the person to the operator's right has the right-of-way. If necessary, the operator is expected to slow down, stop or reverse his craft to accomplish this.

**Getting Underway** — Boats leaving slips, wharves and piers have no rights until they are in open water. Therefore, you must proceed with caution.

**Sailboats** — With only one exception, the sailboat has the right-of-way over power craft. The only exception is the unlikely situation of a sailboat passing a power craft.

**Fishing Boats** — Take it easy when you are passing near fishermen. Fishing boats whether anchored or underway with nets, lines or trawls out, have the right-of-way.

**Accidents** — In any emergency, it is the duty of the boatman to stand-by and render all possible assistance.



## Outboard Thefts Hit Million-dollar Mark

Carelessness cost the outboard boatman \$1,000,000 last year. That's the price tag for engine thefts in 1964 based on a recent survey conducted by Evinrude Motors.

The problem of stolen engines has grown steadily in recent years. More than 500 thefts were reported to Evinrude last year, an all-time record, and that's just one manufacturer. Multiplied across the board, engine thefts probably hit the million-dollar mark.

The problem of motor thefts is probably worse than the survey showed. Evinrude believes many thefts were never reported to the company.

Portability is one big reason why thousands of boatmen prefer small horsepower motors. Apparently



this feature attracts the thief as well. Better than one-third of the thefts involved motors of less than 10 horsepower. That should serve as a warning to the fisherman who has the habit of leaving his rig unattended.

Get  
PERMISSION  
to  
HUNT or FISH

Weight is no deterrent. The Milwaukee firm stated that 60 outboards in the 60-, 75- and 90-horsepower ranges were lifted by light-fingered but strong-backed thieves.

One of the prime reasons for this rising crime rate is carelessness. Outboard owners don't take the same precautions with their rigs that they do with their automobiles. Most people roll up the windows and lock all the doors when they leave their car in a dimly lighted parking lot. Strangely, many boatmen think nothing of leaving their boats in isolated areas secured by a single mooring line or parked aboard their trailers ready to go.

If your motor is stolen, it's probably gone for good! The recovery rate is less than one percent, says Evinrude, one good argument for adequate insurance coverage. It's a sign that boatmen don't take the time to properly register their equipment. Many can't identify their motors even when they see them again.

The low recovery rate also indicates that there is a market for the "hot" motor, and we're not talking about speed. There's a double danger involved for the customer looking for this "quickie deal." A New York man purchased an engine that was later identified as stolen property. The insurance company that paid the original owner for his loss had a legal right to reclaim the engine. They did just that. That left our New York friend without his money or the motor.

Manufacturers recommend that you purchase a used motor from an established dealer or someone you know. When you buy, get the motor's registration card. It is issued only once to the original buyer.

Evinrude offers the following suggestions to protect your boat and motor against theft:

1. Record all serial numbers on the boat and motor and register them with the manufacturer. Keep a copy of these numbers for yourself.

2. Use a chain and lock to secure your motor to your boat.



**K. Mark Scott, Manhattan, holds state record northern pike taken from outlet tubes below Tuttle Creek Reservoir.**

The Kansas Forestry, Fish and Game Commission has now certified the first northern pike record for Kansas. Although northerns were introduced into some Kansas waters only four years ago, the record fish weighed a whopping 13 lbs., 8 ozs.

The lucky angler is K. Mark Scott of Manhattan who caught his prize while fishing at the outlet tubes below Tuttle Creek Reservoir. Scott took the fish on February 6, 1966, while fishing with a spinning outfit baited with a yellow leadhead jig. The northern measured 37 inches long with a girth of 17 inches.

The original stocking of northern pike was made in Tuttle Creek Reservoir in April of 1962. An experimental spawn taking program was tried this year on northerns with the artificial hatching process carried out at the Kansas State University fish rearing station.

3. When trailering your boat, don't leave it unattended. At night, wrap the trailer safety chain around a tree or post and secure it with a lock. Don't think your rig is safe parked in your garage. Thieves have been known to pull right into driveways, hook-up and pull away.

4. If your motor has electric starting, never leave the key in the ignition. Protect manual starting motors by removing a spark plug.

5. Report all thefts immediately to local authorities, your marine dealer and the manufacturer.

Here are some suggestions to protect yourself against the "good deal" on a motor from someone you don't know:

1. Be suspicious of anyone who's quick to sell a motor at less than its reasonable market value.

2. Make sure you get the registration card issued by the manufacturer. If he doesn't have the card, have the seller write out a full description—make, model, color and any identifying marks.

3. Be suspicious if the motor is missing any of its electrical connections. Many times thieves in their haste to make a clean getaway cut the wires and connections with a knife.

**PROTECT  
AMERICA'S  
CLEAN  
WATER**



WATER  
POLLUTION  
CONTROL

# Why Go Fishing?

Many persons have asked this question of many anglers in the past and I'll wager that someone, sometime, will ask this question of you. To one who has never gone fishing, this may seem to be a legitimate question.

When someone does ask the question, "Why do you go fishing?", the ardent fisherman usually dismisses the inquiry with a shrug of the shoulders or a sad shake of the head. After all, anyone who would ask a question like that has never really been fishing and he wouldn't understand the answer if you told him. And, away you go, mumbling about drugstore dudes and guys who wouldn't know what to do if you got 'em off the seat of their pants.

So what are you going to do when I ask you this question? Well, I hope you don't dismiss me as a guy who belongs to the uninitiated clan. After all, I've dunked my share of crappie minnows and I can tell the difference between a chunk of 20-pound monofilament and a 3x tippet. I also know that you find baits on something besides a bucket and in a barn.

"So, what are you driving at," you ask? It's just this. How many of us fisherman have really asked ourselves, "Why do we go fishing?" The answer to this question goes a lot farther than the stock reply "'cause it's fun."

I've known a lot of fishermen who claim to fish because they like to eat good fresh fish. Then there are those who never eat the fish they catch; they either throw them back or give them away.

There are some who fish alone and like it that way. Others I've known won't go fishing at all if they can't find someone to go with them and the more the merrier, provided that they are the "right kind" of fellows.

There are some who go for the exercise and spend all day flipping a plug and there's the other type who goes to get some rest. This latter type baits up, casts out and leans back for some sky gazing. If he gets a strike and hooks a fish, that is a bonus for an otherwise satisfactory day. I even knew a fellow once who, after fishing hard all day without a strike, threw his rod, reel, tackle box and everything right into the lake, vowing he was through with fishing. However, the next morning he was back with a heavy, borrowed rod trying to snag out his discarded equipment.

Yes, there are certainly all types of fishermen and I don't suppose that any two of them would give you the exact same answer to the question at hand. There are as many different reasons to go fishing as there are fishermen.

Even with all of their differences, I'm wondering if there isn't some sort of a common denominator that is shared by nearly all those who enjoy being called an angler. In first place, I would put the *challenge* of fishing. Man, in his constant search for a nebulous reality, needs a challenge without pressure. This need is satisfied in many through the sport of fishing. If he makes a good catch, he has met the challenge. If he doesn't there is always another day and another opportunity to pit his skill against an unpredictable creature.

Then, there is the change of pace. This is the refreshing part about fishing since the methods can vary so much. The farmer or mechanic who spends his working day in a busy flurry of physical activity can unwind taut nerves and a kinked back while waiting for the catfish to bite. The bookkeeper or business executive can unlimber muscles and relax his mind while casting a plug for bass. Each of these types of

fishing provides the change of pace for certain individuals.

Another aspect of fishing which we often feel but seldom realize is the value of just being out and away from the concrete and asphalt and close to the blue of the sky by day and the wonder of the stars at night. It's the joy of association with the squirrel and the marsh hawk, the plaintive call of the poor-will at dusk and the rustle of wings as an unknown creature passes by in the night. It is the feeling of oneness with nature and the Creator.

You can probably think of many reasons for going fishing that I haven't even thought of. If you do, so much the better. You'll have just that much more reason for loading up the car with tackle and heading for your favorite bend in the creek or your favorite spot on the lake. Anyway, we can both feel sorry for the guy who seriously asks us, "Why go fishing?" — G. VALYER.

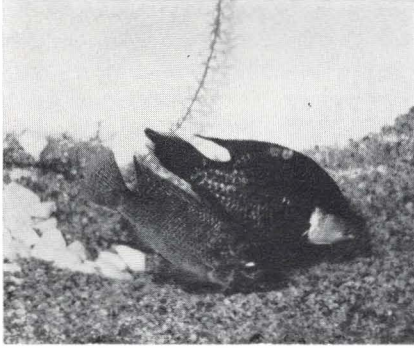
## Watersheds

(Continued from page 13)

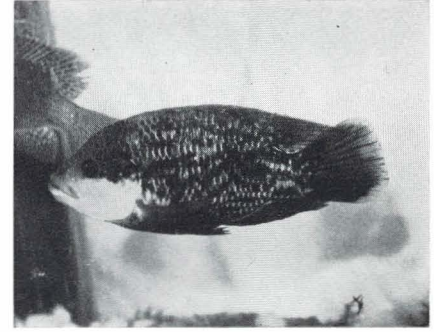
The Kansas Forestry, Fish and Game Commission has indicated an interest in the development of watershed lakes for additional fishery resources. Where watershed lakes are still in the planning stage, the commission may be interested in providing additional monies to build a larger reservoir than is planned provided that the land on which the lake will lie can be titled to the commission. The latter stipulation is to insure public access at all times.

The potential for watershed lakes is great indeed, but full realization and utilization of this potential is yet to come. It can only be realized through cooperation of all interested individuals and agencies.





Courting behaviour over nest of male Java Tilapia and female Nile Tilapia.



Male Tilapia Mossambique.

# The *Tilapia*

By DR. ROBERT J. BOLES

Department of Biology, Kansas State Teachers College

EDITOR'S NOTE: *Tilapia* are not available from the Kansas Forestry, Fish and Game Commission. Studies so far are in an extremely preliminary stage and considerably more work will need to be carried out before it is possible to determine if these fish have any value in fishery management programs in Kansas.

Fisheries biologists are constantly searching for fishes and fish-stocking combinations that will produce a larger supply of fish of a desirable size for the angler.

In general, it is better to use fish native to the area, as they are adapted to meet the annual climatic variations that occur throughout the year. Also, as all the available niches in the aquatic habitat are occupied, any introduced species succeeds at the expense of one or more of the species already present. The introduction of carp by early-day fishing enthusiasts has shown how an exotic species may explode in numbers, and in many cases become quite undesirable, competing for food, nesting, and living space with those already established there. Once established, the elimination of such fish becomes almost impossible. In the light of past experiences, extreme care and adequate study and re-

search should be undertaken before a new species is liberated within the waters of the state.

The bass-bluegill combination used by many states has not proved too satisfactory in a large number of cases. The bluegills usually increase to such numbers that they become stunted, as well as interfering with the nesting success of bass, until there is no longer desirable fishing available.

One of the fishes now being studied for possible use in the stocking program is the tilapia. Swingle (1960) states: "One of the most spectacular developments in freshwater fisheries within the past quarter century has been the rise of a cichlid, *Tilapia mossambica*, to major importance as a pondfish throughout much of the world."

The family Cichlidae contains over 600 species of fishes in addition to the Java tilapia mentioned above. These fishes are distributed mostly in Africa and South and Central America. The two species which have received the most study to date are the Nile tilapia, *Tilapia nilotica*, and the Java tilapia, *T. mossambica*.

The Nile tilapia was introduced into southwestern United States in

1957 as a prospective pond fish and a fish to control various types of noxious aquatic vegetation. Much of the early work was done at Auburn University in Alabama.

The fish has the general appearance of a sunfish. Spawning occurs continuously throughout the summer, with many sizes being represented in the population. When conditions become favorable for spawning, the males establish territories in water about two feet deep, which they defend against intruders. They build saucer-shaped nests, and females visiting the area pair off with the males. As the eggs are laid and fertilized the female gathers them into her mouth and leaves the male, who again resumes his courting activities. In the two species previously mentioned all incubation duties are carried out by the female, though this is not true of all species of tilapia.

The young remain with the female for several days after hatching, and, with the approach of danger, are taken into the mouth cavity through the mouth and gill clefts. Each female may produce from 50 to over 1000 fry per spawn, depending upon the size of the fish.

## Wisdom and Understanding

THE Imperial Chancellor, Kung-sun Hung, petitioned the Emperor, saying: "The people should not be allowed to possess bows or crossbows. When 10 bandits bend their crossbows to the full, a hundred officials dare not advance. . . . If the people are not permitted to possess bows or crossbows, then thieves and robbers will carry only short weapons, and when 2 groups carrying short weapons meet, the larger number will be victorious. . . . In your subject's humble opinion, it will be advantageous to forbid the people to carry bows or crossbows."

When the Emperor sent down this suggestion to his council for discussion an elder, Shou-wang, replied, saying:

"Your subject has heard that when the ancients made the 5 kinds of weapons, it was not for the purpose of killing each other, but to prevent tyranny and to punish evil. When people lived in peace, these weapons were used to control the fierce animals and to be prepared against emergencies. If there were military affairs, then these weapons were used to set up defense and to form battle arrays. . . .

"Your subject has heard that the Sage Rulers brought the people together and practiced shooting to demonstrate instructions, and he has never heard any prohibition on bows or arrows.

"Furthermore, the cause for prohibition is that the bandits use them to attack and rob. The crime of attacking and robbing is subject to death; yet that they have not been stopped is because the great law-breakers do not care, indeed, to avoid severe punishment. Should the suggested prohibition be enforced, your subject fears that wicked persons will still carry weapons and the officials will not be able to stop them from carrying them, and that the good people who keep their weapons for self-defense will encounter the prohibition of the law. This will make the power of robbers exclusive and take away the means of defense from the people. . . ."

When the petition was presented, the Son of Heaven questioned the Imperial Chancellor, Hung, who promptly withdrew his suggestion.—From *The History of the Han Dynasty, 124 B. C.* (Reprinted from *The American Rifleman*, Washington, D. C., July, 1965.)

Females may produce young about every 45 days, allowing each one to reproduce several times during the summer.

The rate of growth is rapid. Under favorable conditions, a fish may reach a length of four inches in about 50 days and up to seven inches 90 days after hatching. A production of over eight tons of tilapia per acre was reported from the tropical waters of Thailand (Pongsuwana, 1956). In Alabama,

using both fertilization and feeding, a production of over 4,000 pounds in 196 days was obtained.

Bass-tilapia combinations in Alabama showed a much faster bass growth than was obtained in bass-bluegill combinations. Comparable figures for Kansas are not yet available.

Both the Nile and Java tilapia offer sport for the fisherman. Ponds stocked with Java tilapia in May may produce a catch equal to 500

pounds per acre late in the summer, over twice the average from bluegill-bass ponds during the second year after stocking. It appears that tilapia, with feeding, can produce fishing within a short period of time. In Kansas this fishing would be during the late summer and early fall months, as tilapia cannot over-winter in ponds in the state. The catchable fish will be primarily in the five- to eight-inch groups. Tilapia should be of special interest

to individuals considering a fee-fishing enterprise, as the fish will provide excellent sport under heavy angling pressure.

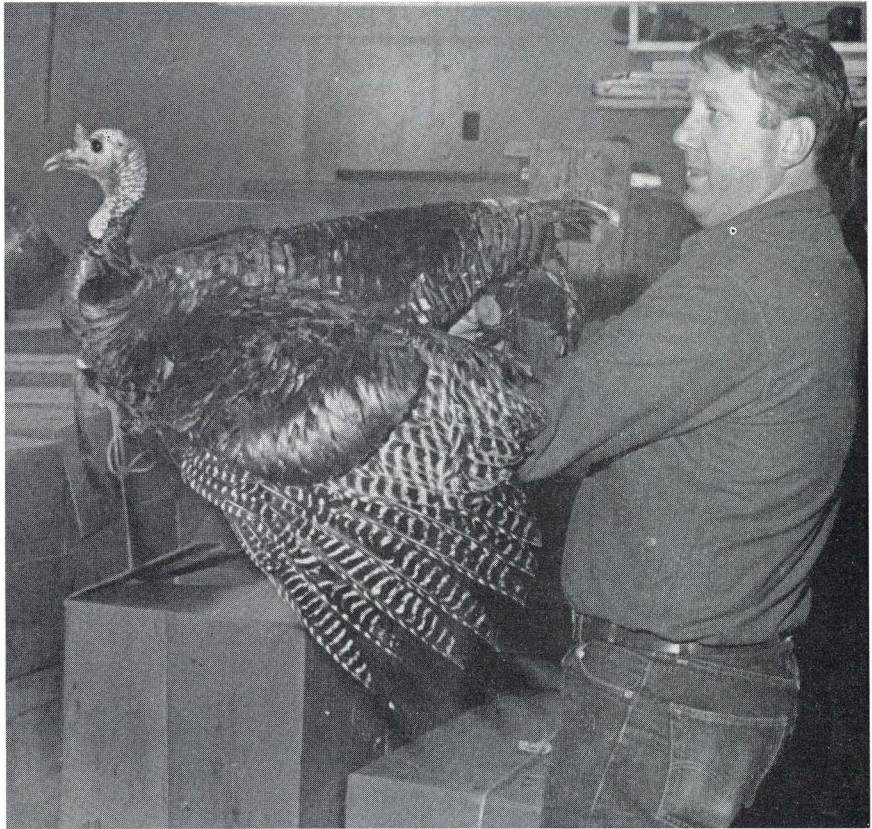
A number of Nile tilapia were acquired last winter from the Fisheries Division at Auburn University, and kept in the laboratory at Kansas State Teachers College until spring, as the fish cannot withstand temperatures below 50° F. The fish, kept in large metal tanks, fed readily upon prepared catfish food. They were transferred each week to clean water, and no losses were experienced due to handling.

Sixty fish were released in the two-acre pond on the Ross Natural History Reservation on May 5, when the water had reached a temperature of 70° F. Numerous nests were observed in shallow water 17 days later, and schools of young tilapia were common about the edges of the pond by June 15.

Spawning continued throughout the summer, and ¼-inch fish were plentiful when the temperature fell to lethal levels late in November. Fluctuations in water level, as is common to Kansas ponds, appear to have little effect upon reproductive success, probably due to the fact that the eggs are picked up by the female as soon as they are laid and fertilized and carried to deeper water.

Several hundred two- to four-inch fish were seined from the Reservation pond late in October for keeping in the laboratory until spring. Some of these will be stocked in ponds containing (1) channel catfish only, (2) bass only and (3) channel catfish and bass. Reproductive success of the tilapia in the face of bass predation, as well as food utilization in conjunction with channel catfish feeding, will be observed.

A small supply of Java tilapia has been obtained and is being kept in the laboratory for stocking in the pond on the Natural History Reservation in the spring, in order to compare the spawning success and behavior of this species with



Hlavachick displays Rio Grande wild turkey ready to be placed in release box for transportation to its new home. (Pratt Tribune photo by Don Wright.)

## Grange Opposes Restrictive Gun Laws

The National Grange has registered its opposition to unduly restrictive federal firearms controls.

In a policy statement adopted at its annual meeting recently, the 850,000-member farm organization opposed legislation that would "lead to or impose" a federal system of firearms registration or "infringe upon the rights of citizens to own and bear arms."

the Nile tilapia grown there the past summer.

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The Grange also called for tougher sentences for criminals convicted of major crimes.

In its policy statement on crime, the Grange said that "one of the most effective deterrents to crime is the certainty of punishment. . . . In recent years, there has been an increasing tendency on the part of many magistrates to permit convicted criminals to escape punishment . . . by suspended sentences once they have been pronounced."

To combat this, the Grange called for "sentences proportionate to the gravity of the offense," greater public support for law enforcement officers, and a more careful screening of parole applicants.

The Grange also said it would support reasonable measures to keep handguns from juveniles, felons and mental incompetents.

# Wild Animals as Pets

By EDWIN J. FRICK, D. V. M.  
Kansas State University

Every once in a while some sportsman has the yen or opportunity to obtain a wild animal as a pet. Wild animals as pets are cute, they are interesting and very entertaining. Such pets cause comment among the neighbors and, whether you are the possessor of a captive raccoon, skunk, wildcat, opossum, squirrel, or coyote, it marks you as different. However, you should be advised of certain facts which would give you distinction in another way. Some animals taken from the wild may not be legally possessed. The law states that game and furbearing animals may not be possessed except during open seasons. Also, the possession of wildlife is a likely means of bringing you a lawsuit especially

if a neighbor's child gets bitten. The damage you do to your lovable pet by making it unfit to cope with a normal life in the wild should bother your conscience. Most cute, baby wild animals are unpredictable and dangerous as soon as they mature. I have known of some serious injuries inflicted by grown pets. If a sudden movement is made near a wild animal, their instinctive reaction often overcomes any tameness. Such instinct is inherited through the generations in order to survive in the wild.

In obtaining an animal from the wild, you are dealing with an unpredictable and unknown factor. Take the couple in Buffalo, New York, last year. They found a nice skunk in the wild. They had it

descended and hoped to domesticate it. However, the skunk bit both the man and his wife and also the veterinarian and his two attendants before it was obvious that the skunk was becoming rabid. Five people were exposed to the most dangerous of diseases not to mention the pain and expense of the necessary shots. Here in Kansas in the first nine months of 1965, one hundred and ten cases of known, proven rabies in skunks were reported at the Kansas State Diagnostic Laboratory at Manhattan. Wise people leave wild animals in the wild. That is where they belong. That includes baby deer and birds, rabbits and all of nature's creatures. All should be left in their natural surroundings.

Rabid mothers often desert their young along with infecting them. A bite or scratch can do more than a little damage to you and yours. If you must have a wild pet and want to accept all the inconveniences that it entails, buy a ranch-bred animal and, later, when the novelty wears off, donate it to your local zoo. With over one hundred diseases of animals transmittable to man, it is wise to leave wildlife in the wild. It is better for them and much better for you.

(EDITOR'S NOTE: State law prohibits the taking or possessing of wild game animals or fur-bearing animals except during open seasons. Game animals includes squirrels, rabbits, deer and antelope. Furbearing animals are declared to be beaver, otter, muskrat, skunk, mink, raccoon, opossum, civet cat, badger, bobcat, lynx, marten, weasel, red or gray fox and swift or prairie fox. The regulations should be consulted to determine the legal open season for each species. Animals lawfully obtained from a licensed game breeder may be possessed at all times; however, one must obtain a game breeders license before selling such animals.)

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## Note on Trap and Skeet Shooting

TRAP and SKEET are two separate shotgun sports. They are based on the shooting of clay targets thrown from a device known as a "trap."

Both TRAP and SKEET are organized sports with regulating national associations, formalized tournaments, and governing rules. They are shot over competitive fields of precise, constant specifications. Although both sports are followed throughout the world, their greatest popularity is in the United States

Trapshooting dates back to 18th century England. Trapshooters (usually five in number for a "squad") fire from five adjacent positions in a crescent-shaped formation 16 or more yards behind the "trap." Shooting is done in rotation with the person in number one

position firing first and so on. Each person fires at an individual target. After each person fires five shots from a particular spot on the crescent, all move one position to the right until each has fired from all positions—for a total of 25 shots.

The "trap" is concealed in a low concrete building ahead of the shooters. Clay targets are thrown out of the building at various angles unknown to the shooter. The clay targets usually sail from 48 to 52 yards and in any direction within a 45-degree angle. A perfect score (25 consecutive hits) is called a "straight."

Doubles, where two targets are thrown simultaneously, are shot from the 16-yard line. A round accounts for 25 pairs, or 50 targets.

# Public Hunting at Norton Reservoir

By GRAYDON W. CLARK

Norton Dam and Reservoir is located on Prairie Dog Creek in Norton County, approximately two and one-half miles southwest of the City of Norton.

The dam, spillway and some of the major roads were completed in December, 1964. As an irrigation, municipal water supply and flood control project, the reservoir will provide many benefits, both economical and recreational, to the community as well as to the state at large. At conservation pool level, elevation 2,304 feet mean sea level, Norton Reservoir will impound 2,230 surface acres of water creating a shore line of approximately 35 miles and backing water seven and one-half miles upstream in Prairie Dog Creek.

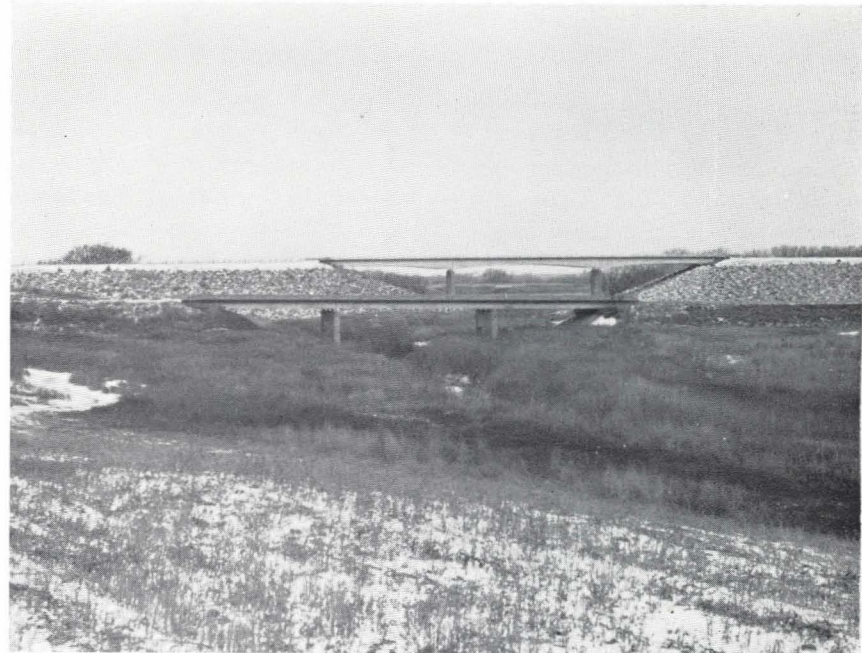
The Kansas Forestry, Fish and Game Commission assumed the responsibility of administration of the water and the wildlife lands in April of 1964 through an interim license with the Bureau of Reclamation. This license allows the commission to operate approximately 3,700 acres at the reservoir site for fish and wildlife management previous to the actual completion of the reservoir. The Kansas Forestry, Fish and Game Commission will have about 5,500 acres of land and water for fish and wildlife management through the negotiations of a "General Plan" with the Bureau of Sport Fisheries and Wildlife, and a "Memorandum of Understanding" with the Bureau of Reclamation upon the completion of the construction and land acquisition at that reservoir.

A program was started in 1964 which called for the development of extensive wildlife habitat. This program provides for the establishment of food and cover plantings for both upland game and waterfowl species. The commission has leased the agriculture lands

*(Continued on next page)*



Felled trees, arranged in brush piles and tied down, will offer high quality fisheries habitat. These will be marked for fishing purposes.



The old U. S. Highway 383 bridge in the foreground across Prairie Dog Creek will be altered and left for fisherman use.

**Norton Reservoir***(Continued from page 21)*

to local farmers on a share crop basis with the state's share generally being left in the fields for utilization by wildlife. Numerous food plots, tree and shrub plantings will be initiated in 1965 to improve the upland game habitat on the project. All of the lands will be fenced in the future and signs designating those areas open to hunting and those closed to hunting will be erected.

Approximately 640 acres of land and water administered by the commission will be set aside as a waterfowl sanctuary just east of the relocated US-383. The purpose of the sanctuary is to provide an area where waterfowl may loaf and feed without being molested, resulting in larger numbers of these birds being held in the area for a longer period of time, thus increasing the opportunity for the hunter to harvest waterfowl.

Access to the dam is possible from the southwest at Colby by US-383, from the west at Oberlin by US-36, and from the east at Norton by US-383. U. S. Highway 383 spans the upper reaches of the reservoir. Access along both sides is possible by numerous all weather roads, some of which are yet to be constructed.

**A Note on Skeet**

Skeet shooting is an American invention, circa 1910. The word "skeet" itself is an archaic Scandinavian word for "shoot." The average "skeet" squad is composed of five people each of whom shoots a round of 25 shots. The similarity to trapshooting ends there.

The skeet field is laid out in a semicircle (or half-"clock") with eight stations for shooting. Seven stations are positioned at equal distances on the perimeter of the "clock" with the eighth in the middle on a line between position one and seven. (Station one would be the numeral "12" on a clock; posi-

tion seven would be the numeral "6.") High targets are thrown from station one at one end of the semicircle; low targets from station seven at the other end. The trap houses at station one and seven are called the "high house" and "low house." Targets are always thrown in the same pattern of flight, but the angle of the shot varies because the shooter changes positions as the skeet squad moves from station to station. Two targets are shot from each of the eight stations—one from each house.

Doubles, where targets are thrown simultaneously from both houses, are then shot from stations one, two, six, and seven. The 25th shot is called "optional," for it is a repeat of the first miss. If the shooter breaks all of his first 24, he can call for a target from any station or house as his optional shot.

The National Skeet Shooting Association is the regulating body of skeet and issues all rules governing the sport's formalized, registered tournaments. Skeet is shot over competitive fields of precise, constant specifications. Skeet is followed throughout the world with its greatest popularity in the United States.

**Gun Cases**

Gun cases, particularly the sheepskin lined variety, are designed for carrying, not storing, guns according to experts at Remington Arms. When you get home from a day of hunting or target shooting, you should take your gun out of the case and put it in a rack. Stored in the case, it may sweat and then rust.

Perspiration is a major enemy of firearms. After a gun has been handled, the metal parts should be wiped off with a lightly oiled rag. Otherwise fingerprints may be preserved in rust. Taking a gun in out of the cold to a warm room can also cause rust-producing condensation if you're not careful.

**Head Space**

The dimension in a gun or rifle that determines whether the cartridge is tightly breeched up in the chamber when the breech, breech block or breech bolt is shut is called the *head space*. Or, it is the distance in the chamber between the face of the breech bolt and the face of the cartridge. A minor variation in the cartridge can be compensated for by this clearance, which usually is under three one-thousandths (.003) of an inch. When head space is too little the breech will not close on the cartridge. When there is too much head space, it not only will cause misfires, but will create a hazardous condition. Too much head space indicates excessive wear on the bolt-locking lugs and their protective wells.

**3-Dram**

The term, "3-dram equivalent," abbreviated "3 dr. equiv." in describing a load means that the amount of smokeless powder used produces the same shot velocity as would 3 drams of black powder. To clarify: A dram is a unit of measure. There is an average of 16 drams in one ounce—256 in a pound. (The powder charge in black powder shot shells at one time was measured in drams. Today's smokeless powder is more powerful.) When loading a shell with smokeless powder, a smaller weight of powder is needed to give the same muzzle velocity as would be obtained if the shell were loaded with black powder.

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