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Spring 1967



Operation "Walleye"

*Wild Turkey--Our
Next "Big Game"*

Stripers in Kansas

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It's Not Just Our Guns . . .

For the third year in a row, a strict antfirearms act has been introduced in Congress by Senator Tom Dodd (D-Conn.). This year, it has been given the distinction as Senate Bill Number One, more commonly called SB 1.

The bill is long, and contains a lot of legal language—too long to itemize its many parts. However, in a nutshell, it would drastically curtail the ways in which we—you and I and all sportsmen of our nation—are allowed to buy, use, transport, and own sporting firearms.

Fortunately, Dodd's previous efforts have not come to a vote. However, this year, there is added emphasis for passage of the bill. Unfortunately, the President has put his powers and the weight of his office behind it, apparently believing it would be a deterrent to crime in our land. This belief, however, has been disproved in New York, New Jersey, Philadelphia and elsewhere where curbs have been imposed on the sale and use of firearms. Crime in these places, in fact, has increased sharply, because criminals pay no attention to antfirearms laws.

At the same time, there is more at stake in Dodd's bill than just control of firearms. Our Constitution guarantees the right to keep and bear arms. If the Dodd bill is adopted, it will mean that the Constitution will be changed without direct consent of the people. Would this signal the beginning of the loss of our basic freedoms without our consent? Would other constitutional guarantees be removed in the future without our vote?

There is more to be lost than just our guns . . . EST.

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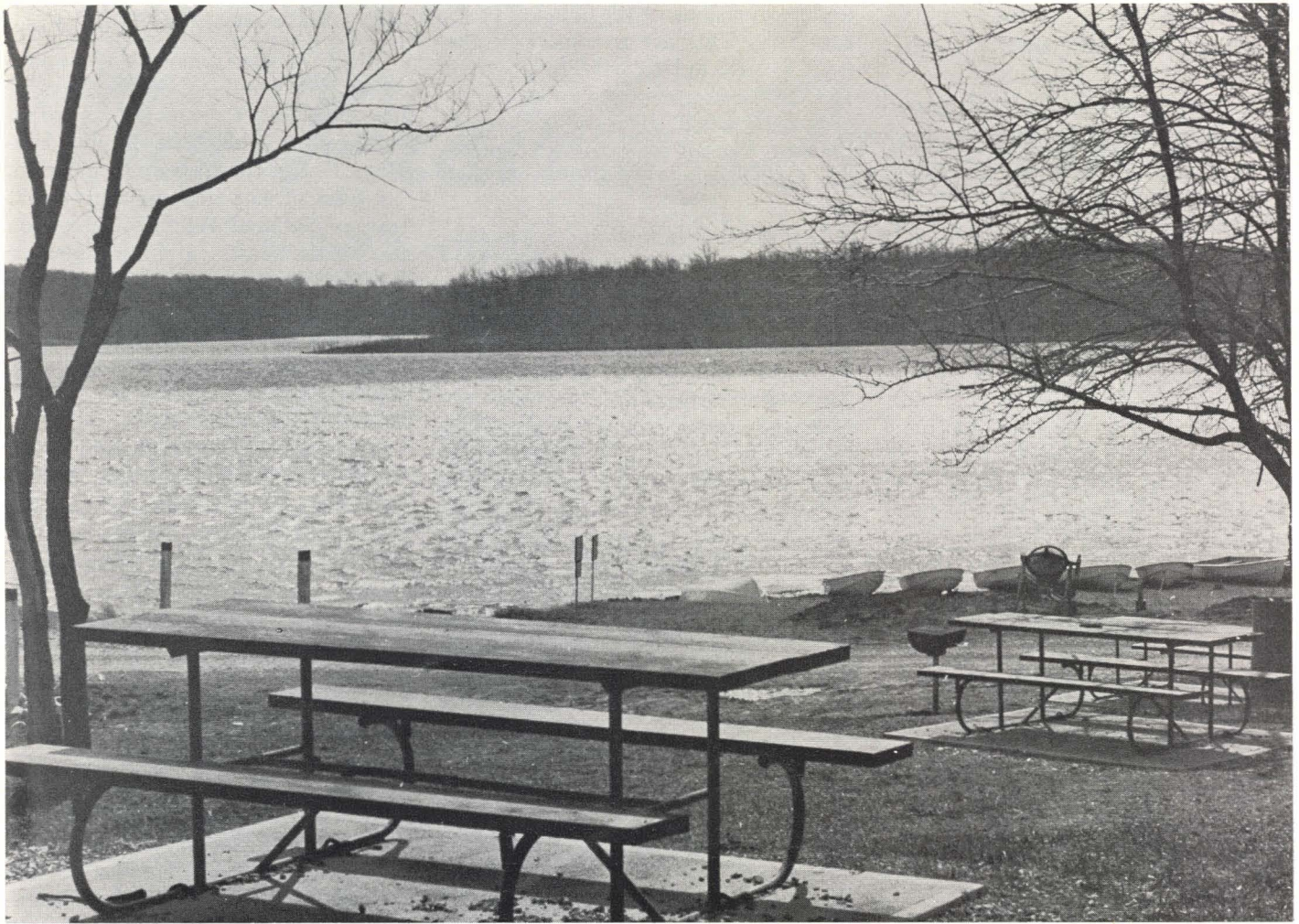
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PRETTY AS A PICTURE—Picnic tables, boats and other outdoor recreation facilities frame the blue, fish-filled waters of scenic Douglas County State Lake near Baldwin.

Douglas County State Lake

By GEORGE VALYER

29th of a Series on the State Lakes of Kansas

Just talk to anyone from the northeast part of the state. "They'll tell you that this lake is a "hum dinger." As one young college student put it, "This is a real fishy puddle." Far from being a puddle, Douglas County State Lake has a lot going for it in its 180 acres of water and its "Ozark" type of surroundings. It's a real surprise to some people to find this kind of country so close to the bustling town of Baldwin. Those who have traveled through the area on U. S. 56 are usually not aware of the fact that the gently rolling countryside you see from the highway breaks away sharply about a mile northeast of town. Suddenly you find yourself in narrow valleys surrounded by steep, wooded slopes.

Located in the headwater area of Coal Creek, the drainage is primarily composed of woodlands and small pastures interspersed with cultivated lands. Upland areas above the lake are more gently rolling than the immediate surroundings and considerable farming activity is practiced. An increased awareness on the part of the landowners concerning soil conserva-

tion has helped to maintain the clarity of the lake waters.

Douglas County State Lake is quite irregular in shape with a ridge of land dividing the lake on an approximate north-south line. The dam itself runs in a general east-west direction across the valley. Since the flow of water is to the north toward the Wakarusa river, the lake backs up south of the dam and the ridge points north like a giant finger toward the center of the dam. On the east side of the dividing ridge, the lake extends up three different arms. To

the west of the ridge, there is only one large arm with several smaller bays.

The city of Baldwin is justly proud of the lake which lies near its back door. Although this lake was opened only a short time ago, its economic impact on the community is already being felt. Merchants report that sales of outdoor related merchandise were up considerably during the spring and summer of 1966 following the opening of the lake in March. Although the concession, a good one, is in operation at the lake, sportmen must still pick up some of their supplies in town. The two miles from the lake to downtown Baldwin takes only a few moments and, there, one can find almost any desired supply or service.

At the lake fishermen can rent a boat and motor, get a variety of bait and fishing tackle or drive away the hunger pangs with a snack. The concession is located at the west end of the dam and provides mooring and docking space, in addition to other services. Straight across the lake arm to the south is the boat launching area and parking space for boat trailers. Picnic tables and sanitary facilities are spaced at intervals along the west shore.

The east side of the lake is reached by driving north from the dam and making a right turn at every public intersection. The east shore area is popular with bank fishermen but access by car is available only to the one developed area next to the dam. From this point, the angler can take off on foot into relatively secluded territory and fish in comparative solitude. Boat fishermen use these waters but the good sportsman respects the rights of the bank fisherman and usually gives him plenty of room.

Douglas County State Lake had its beginnings in 1959 when a preliminary survey by engineers indicated that construction at that site was practical. The dam was completed in 1961 with a total construction cost of \$240,691.

Three-fourths of the cost of the lake came from federal aid monies

under provisions of the Dingell-Johnson Act. This act is a part of the total federal aid to wildlife program and the funds come from an excise tax on fishing tackle. The state's share of the cost, like all other funds spent by the Commission, came from license sales.

Dry weather following construction delayed the filling of the lake but, by the spring of 1963, enough water was impounded so that the lake could be stocked. Bass, bluegill and channel catfish were placed in the lake in April of that year but the lake remained low for another year. This delayed the growth of the fish and the opening of the lake to fishing did not take place until March 5, 1966.

Those who participated in the lake opening will probably not forget it. A cold north wind whipped the water into whitecaps and periodic snow flurries reduced the visibility to a few yards. Fishermen were plagued with lines freezing in the rod guides and the strong winds made casting difficult. None-the-less, fishing was great for those who were brave enough to face the elements. The catch was primarily channel catfish the first weekend with some specimens weighing up to four pounds. Fishing remained good all spring and prospects look fine for the future.

In April of 1966, Douglas County State Lake received a stocking of 300,000 walleye fry as a part of an experimental program to see if these fish will be suitable for smaller lakes. With only a few months passed since their introduction, it is too early to evaluate the effort in any way. Only time will reveal whether or not this lake will produce good walleye fishing.

Five hundred and thirty-seven acres of public land surround the lake and, for the most part, it is excellent game habitat. For this reason, the Forestry, Fish and Game Commission has opened the area to public hunting. These lands are a natural for squirrel and quail and many local hunters report good duck flights during parts of the season. Temporary blinds may be erected provided they are removed immediately after the season closes. An abundance of nut trees—walnut

Whooping Cranes

PRATT—The majestic whooping cranes now number one less than at this same time a year ago, according to reports reaching the Kansas Forestry, Fish and Game Commission.

A total of 43 whoopers are now at Aransas National Wildlife Refuge on the Texas coast. Refuge manager Phil Morgan states that this is one less than the 44 which were counted there last winter.

Several persons reported seeing whooping cranes in Kansas during the fall migration period. This is a normal occurrence since the migratory flight path of the whoopers takes them through the state during both spring and fall.

and oak—are found on the area which creates an ideal situation for squirrels. Quail habitat is also good and hunters report fine success on this species.

Douglas County State Lake is an ideal spot for a family outing. Even if some of the members of the party are not interested in fishing, there are many other activities possible for those interested in the outdoors. A variety of trees and plants provide interest for the amateur botanist and bird watchers should find a variety of species. Although there are no marked trails, the hiker will find numerous fascinations in the rocky hillsides and draws. Horses may also be rented nearby for those who enjoy a canter through the countryside. At the concession, a foot powered paddle boat is available for short cruises or, if you are really energetic, a trip around the lake.

Access to the west side of the lake is by way of an all-weather road leading north from Baldwin. It's only 2½ miles and the road is plainly marked. Several of the lake-side access roads have recently been graveled and wet weather should present no problems to the fisherman.

All-in-all, Douglas County State Lake shapes up as an ideal spot for either the casual fisherman or the serious angler. The fish are there and, with another season or two of growth, many should fit into the lunker classification.

A Spectacular In Springtime

The Prairie Drummer

By MARVIN SCHWILLING

The moon was full, but the first red rays of sunlight had not yet begun to show in the east when I stopped at a gate leading into a big pasture in the heart of the Flint Hills. The activity could be heard from afar, and stepping out of the car into the morning chill I paused to listen. Prairie chickens were whooping it up on a booming ground. They, no doubt, had been there most of the night under the light of a full moon, booming sporadically.

I carefully opened the gate, drove through, then closed it, and followed the meandering trail, with lights off, up a ravine to the top of a big hill.

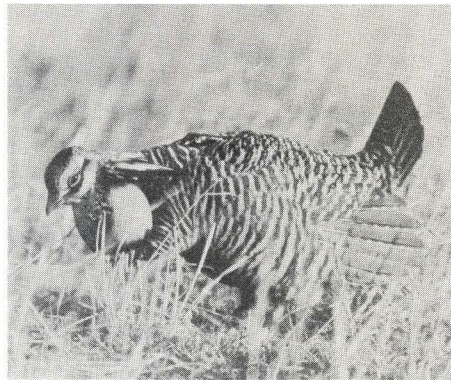
All activity stopped and heads went up on alert as I eased up near the "ground." I stopped the car so that the birds could become accustomed to it. When the rituals resumed I moved the car a little closer. As I edge closer—a hundred feet from the scene now—seven of the birds flushed and flew to a neighboring hilltop. I decided this was as close as the birds were going to let the vehicle approach.

I jockeyed the car into what I considered the best position for observation and shut off the motor. The seven birds which had flushed earlier returned, and mingled with others within my view. Following a short period of inactivity and much suspicion of the iron horse I was driving, they gradually accepted me and went about their awesome rituals, paying me no mind.

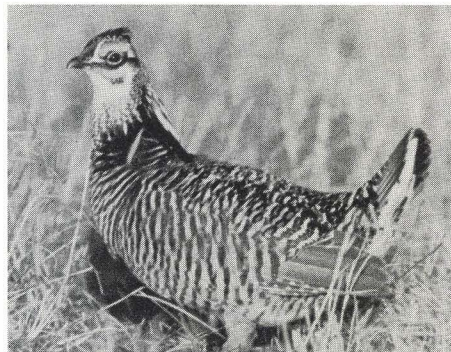
Light improved, and the first rays of the morning sun fell on the hilltop. The sparkling dew on the short grass made a fitting setting for an unbelievable, weird dance.

One of the males close to me characteristically lowered his head, stretched his neck forward parallel to the ground and erected his neck tufts until they pointed up and forward.

As the large golden orange air sacks began to swell on his neck, his tail was spread and held vertically, and sometimes was even inclined slightly over his back. The wings



Drummer Boy . . .



. . . And His Mate

were extended downward and held firmly against the body and legs, and the long wing feathers almost touched the ground.

Except for the lowering of the head, his tail and wing display reminded me much of the stance of a strutting turkey gobbler—appearing strained and rigid. When the air sacks inflated to appear fully as large as an orange and the golden eyebrows were flexed to appear to cover the entire top of the head, the bird made a short run forward, stomped his feet vigorously, shook his head

slightly, and let forth with a "caoor-who-who-who-who-who-who." Then, omitting the first call, and continuing only the "who-who-who-who-who-who," he continued to chant. Each series lasted for a period of about four seconds, after which the air sacks were deflated and they and the golden eyebrows slowly disappeared again under the gray, black and white barred feathers.

The bird paused shortly as if resting. Then, sitting henlike—with no stance preparation—began a "ca-ca-ca-ca-ca-ca-ca-ca-ca" cackle, jerking the tail slightly with each syllable.

This was the activity of only one bird. While he was strutting, 30 others were engaged in similar dance activities.

As I tried to record their sounds in my mind, I found some "cackle" calls shorter than others, with several variations—"ca-ca-ca-ca-ca-ca-ca-ca-ca-kee." Other calls were also used, appearing almost to be a vocabulary—"Caaa-caaa-caaa; kwirk-kward, krk-krk-krk; klee-klee."

Then a challenger confronted my star performer. They faced each other with necks low and outstretched, ear tufts erected, tail spread, wings dropped, but the air sacks not inflated.

Uttering low, whining sounds, they cautiously edged toward each other,

For a few seconds, they eyed each other, then the battle was on. They leaped into the air, flashing their feet and bills forward, tearing at the chest and breast of the opponent.

They met in mid-air for a second, and several feathers were lost. The battle continued into four such contacts before the challenger decided he had enough and turned and ran. The victor vigorously inflated the air sacks and "boomed" his victory.

As I watched these antics, and
(Continued on page 23)

QUAIL: Do They Really Change?

By GEORGE C. MOORE

Quite often I hear sportsmen remarking about the actions and colors of quail which would imply that they look and act differently than they did 25 years ago.

This question, of course, varies frequently with the ability of the hunter to fill his bag. Sometimes, when we have had bad days and all the birds are found in brush-filled draws or they run in front of the dogs, or maybe flush wild, we notice that they are different from their ancestors a few years ago. When we have good days, and find lots of birds that hold well, we think very little about what is taking place. Actually, we sportsmen are correct in assuming that quail have changed from those that we hunted 25 years ago. All kinds of plants and animals adapt themselves

to their surroundings and way of life.

When conditions are constant, animals generally act in a similar manner, although variations within individuals occur all the time even though extremely slowly; but, under changing conditions, these variations become more prominent as a result of the needs for the plants or animals to meet the changing environment.

In other words, our civilization

has not become static. It is dynamic, which results in our quail habitat continuously changing. These birds must adapt themselves to the changing conditions or they will not survive. These changes are made easier because of the continuing variations in individual species that occur each generation.

Let's take a minute to analyze what is really happening to quail and see if we can tie in selective variation with the bird's behavior. I realize that almost every sportsman advances a theory as to why quail act as they do. I doubt seriously if they have been able to recognize the need for these changes that must come if we are to be assured quail and quail hunting survive.

We are all familiar with Charles Darwin's theory of the *Origin of the Species by Means of Natural Selection*. We are also familiar with the many advancements that have been made in agriculture by the process of selective breeding, yet we fail to recognize that this same process is taking place in game birds and animals. Some of this selectivity results from man's activities that are not directly related to the plant or animal. Other characteristics are directly related to man's pursuit of quail.

All of our elderly sportsmen remember that about 30 years ago only a handful of quail hunters were found in each country. Today we have hundreds of thousands of people pursuing the same number of quail that were present only a quarter of a century ago.

Also, a few years ago, quail were normally found in fallow fields or broom sage patches. These birds were not heavily pursued; consequently, they held well to the point. When they were flushed, they frequently lit within a few hundred feet in the



WHUR-R-RR OF BEATING WINGS—John Peterson, Washington, D. C., left, Clarence Poort, Topeka, center, and Bob McWhorter, Manhattan, Northeast Kansas Regional Game Manager, suddenly find themselves in the midst of beating wings as two quail break cover pitting their swift flight against the hunters reactions. The hunters found quail hunting tops in heavy cover near Milford Reservoir. (Photo by Leroy Lyon.)

same open field. By so doing, they were left vulnerable to continuous hunting pressure and sometimes individual coveys were heavily shot because the singles were easy to find.

Because of the certain inherent characteristics, one or two individuals, instead of flushing with the rest of the covey, went into the thickets or timber. These individuals survived. Year after year their offspring would become a little more adapted to this selective characteristic of flushing long distances and into extremely dense cover. Therefore, over a quarter of a century, those individuals

that had adopted the characteristic of flushing wild and into thick cover survived. So, today, we have unintentionally developed a strain of quail by killing those that did not change through selective breeding that do not hold as well as they once did. They tend to light in trees to escape the hunter and, above all, they have learned that the extremely dense thickets afford protection.

This method of changing the habits of the birds may not be as striking as developing a new hybrid seed corn, but it has been just as sure and effective.

Catfish Recipe Booklet

A twenty-page publication, "Fancy Catfish" is now available to those who are looking for different ways to prepare this delicacy. Eighteen different recipes fill the pages of the publication produced by the Department of Interior's Bureau of Commercial Fisheries. If you have some catfish left in the freezer or expect to catch some, this booklet will provide you with some tempting ways to utilize your catch. Copies are available for 25 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.



QUAIL AT REST—Male (left) and female Bobwhite quail. Have they changed through the years?

Wild Turkey— Kansas' Next Big Game

By LEROY LYON and STEVE CAPEL

Kansas-raised wild turkey for Thanksgiving? Such may be the case in the near future as the highly popular, all-American game birds are making a significant comeback in the Sunflower State. Wild turkeys (*Meleagris gallopavo*) have not always been scarce in Kansas. Before the advent of white man, turkeys were common in the eastern two-thirds of the state while in western areas smaller numbers of wild turkeys were also found in timbered areas along rivers and streams.

With the westward advance of white man and with subsequent clearing of land and indiscriminate hunting, wild turkeys began to disappear from the game picture in the area which now constitutes the state of Kansas. Linn County was the last recorded stronghold of the wild turkey in the state.

After the disappearance of wild turkeys, many sportsmen and game breeders became concerned and began to release pen-reared turkeys in areas of prime habitat. Most of these early releases were made with the Eastern wild turkey subspecies as "Easterns" were the most prominent subspecies of wild

turkey in Kansas before the westward march of civilization.

These early introductions of turkeys, although attempted with good intentions, met with failure or with very limited success. Some birds became temporarily established but for the most part pen-raised birds proved to be physiologically and psychologically incapable of adapting themselves to the harsh environment of the wild where the cardinal rule of "eat or be eaten" is a proven way of life.

In 1961 the Kansas Forestry, Fish and Game Commission, operated by and for the sportsmen of Kansas, began the current wild turkey restoration project hoping to find a successful method of establishing the birds in Kansas. The long range goal of the Commission was to provide Kansas sportsmen with a wild turkey hunting season.

The Commission, after considerable research, made two decisions both of which have played a major role in the comeback of the wild turkey. One decision was to livetrapped and transplant the wild turkeys while the other choice was the selection of the Rio Grande subspecies as the bird best suited for Kansas.

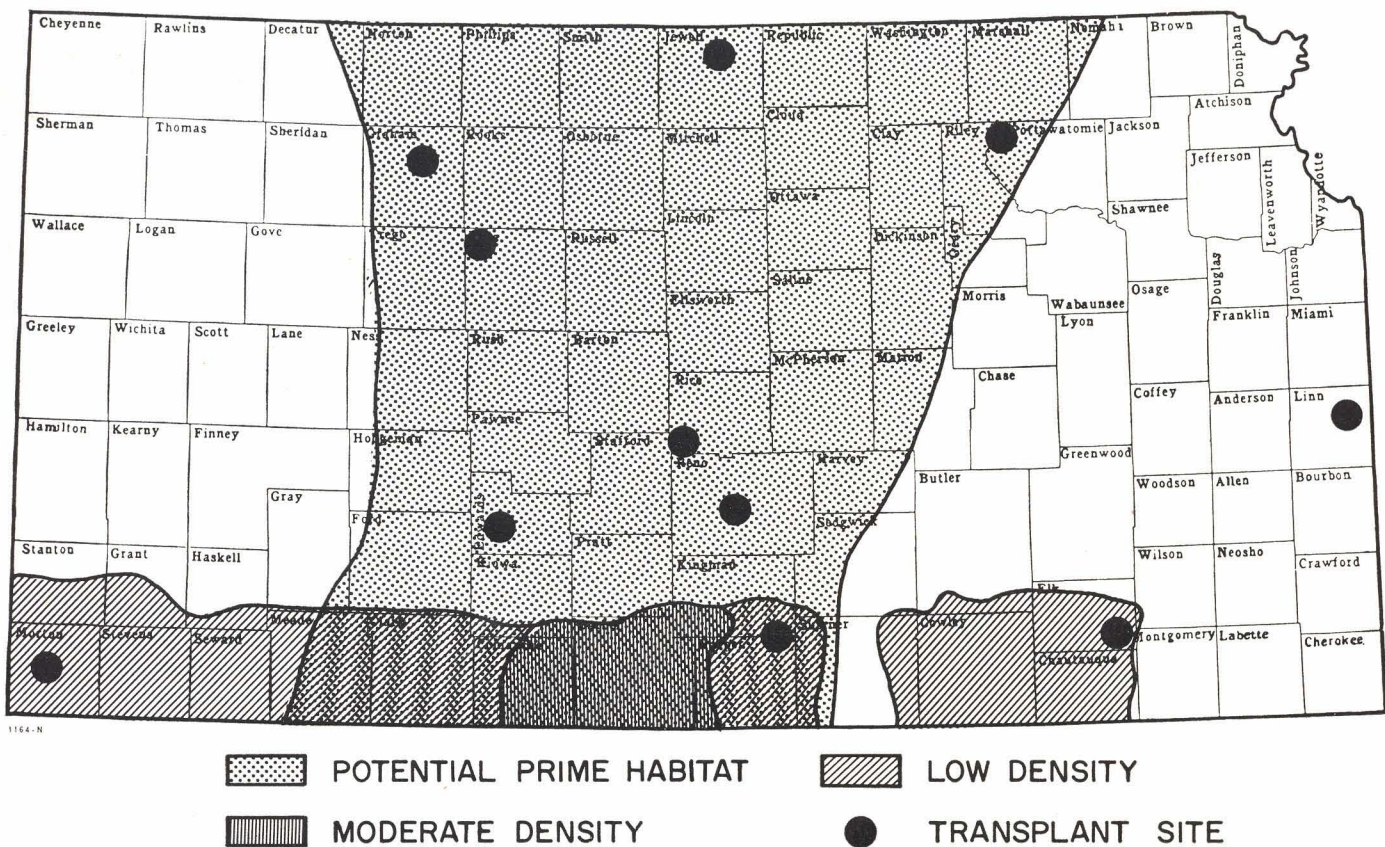
The practice of livetrapping and transplanting had worked exceptionally well in all states using this technique as a means of restoration. Oklahoma, Kansas' neighbor to the south, had hastened the establishment of turkeys by transplanting. It was only logical to assume that Kansas could use the same method provided that large numbers of turkeys could be obtained through trade negotiations with other states who had large populations of the desired Rio Grandes.

The Rio Grande subspecies was chosen as the best wild turkey for the largest percentage of Kansas' land area. This same subspecies was thriving well in neighboring states of Texas, Oklahoma and Ne-



SOME WATCH—OTHERS LOAF—It's all seriousness for some of the pictured wild turkeys in Barber County while others could care less. However, when anyone moves in too close all are in agreement—it's time to be on the move. The extremely wary birds are on the comeback in the state causing optimism for a hunting season in a few years. (Fish and Game Photo.)

TURKEY DISTRIBUTION IN KANSAS 1966



braska—states with conditions similar to Kansas.

The Rio Grandes have been found to reach their greatest density on sandy soil along timbered creek and river courses. They also thrive well in areas where the mean annual rainfall ranges from slightly less than 20 inches to slightly more than 30 inches.

The reason Rio Grandes were selected over "Easterns" was due mainly to a change in Kansas' habitat. The Easterns, most predominant subspecies originally native to Kansas, required large tracts of nut producing trees and large expanses of timber or woodlands. Acorns are an essential item in the late fall and winter diet of this bird. Timbered areas, important to the Eastern turkey, were cleared for agricultural purposes.

Rio Grandes, on the other hand, do not require heavy timber and oaks. In the spring and summer, Rio Grandes feed mostly on greens and dry seeds with insects, mainly grasshoppers, and fruits becoming more important during the summer.

In winter these birds feed on dry seeds of weeds and grasses as well as nuts. During the entire year waste agricultural grains are important in the bird's diet.

Another reason for selecting the Rio Grande subspecies was that there were already a small number of these birds residing in Kansas after migrating into the state from Oklahoma. The turkeys for several years had been using the many watercourses that connect the two states as avenues of travel.

Most of these Rio Grande wild turkeys, called "native flocks" are located in south-central Kansas with the largest concentrations presently centering in the Barber-Comanche County area. They may be found along the southern tier of counties from Elk and Chautauqua counties west.

Considerable research was conducted on the "native flocks" by the Commission with data revealing that the general population trend and expansion was slow. Many of the birds would nest, bring off

young and spend the summer in Kansas only to move back into Oklahoma to flock together in winter. It became obvious that livetrapping and transplanting would have to be carried out if a large, huntable population of wild turkeys in Kansas ever became a reality.

In March of 1965 the Commission conducted its first transplant releasing four hens and three gobblers along the Arkansas River west of Kinsley in Edwards County. From all indications there was at least one brood, possibly two, produced from this transplant. Three young poults were found dead shortly after the big flood on the Arkansas River and three adults were accounted for in the Garfield region. Four other adults and three young were located in the Kinsley region so obviously there was some reproduction.

The Commission negotiated an agreement with the Texas Parks and Wildlife Commission in late 1965 agreeing to trade 200 lesser prairie chickens for 125 livetrapped Rio

Grande wild turkeys. On January 27, 1966, these birds, 94 hens and 31 toms, were delivered from Texas and transplanted at 11 release sites throughout the state. Nine hens and three toms were released in each preselected site except for the release at Kinsley where four hens and one tom were used to supplement the previous 1965 transplant.

One release, made on the Marias des Cygnes River near Boicourt in Linn County, as strictly an experimental test to determine if the Rio Grande wild turkey could adapt itself to far eastern Kansas habitat, conditions and climate.

Other sites where imported turkeys were released were: (see map on page 9) 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 near the Elk River in Elk County and south fork of the Solomon River near Bogue in Graham County; the Arkansas River near Alden in Rice County; Saline River in Ellis County; the Chikaskia River near Argonia in Sumner County and the Cimarron River in Morton County.

The first goal in the restoration program was to establish a flock on each of the major drainages in the state's major turkey range. When the flocks at the release sites increase enough to warrant it, the Commission hopes to live-trap some surplus birds and transplant them to new areas to speed up the restoration program. Trapping wild turkeys from areas that have adequate populations and releasing them where habitat is suitable is most important in turkey management.

It may be too early to safely predict the outcome of preliminary efforts made by Commission personnel. However, data recently compiled indicates that the imported, transplanted wild turkeys have adapted well and are reproducing at a rapid rate.

At present the wild turkey population in the state is at the highest level since the turn of the century with from 750 to 1,000 wild turkeys estimated.

Most significant is the number of



IT'S TIME TO LEAVE—At least that's what these Rio Grande wild turkeys seem to be thinking as they slip through tall grass trying to escape detection. The heaviest concentration of flocks in the state is in the south-central section in Harper, Barber and Comanche counties. (Fish and Game Photo.)

young hatched during the spring of 1966 at the release sites. Game protectors, game biologists and landowners have counted a total of 210 poults on 10 of the 11 release sites — an outstanding hatch for the first spring following release. No population count has been obtained from the other release site in Morton County.

Not only has reproduction been significant but also noteworthy is survival of adult breeders. Less than 25 of the original 125 released are unaccounted for.

Everyone is familiar with the appearance of the domestic turkey but not so many have seen a wild turkey. The wild turkey is a streamlined version of his domestic cousin, with a longer neck, longer legs and a head more predominantly blue. True wild gobblers seldom exceed 24 pounds.

The Rio Grande subspecies has a tail and upper and lower tail coverts tipped with buff-tan; the primaries have wide bands of black and narrower white bars and the lower back is bluish-black with a small amount of iridescence.

Nests of the Rio Grande turkeys are usually made in depressions scratched in ground litter and are often located under some type of brushy cover. They may nest in alfalfa or grass near field borders or at the edge of a clearing.

Egg laying begins about mid-April and runs through the first week in May. They lay an average of two eggs every three days. The clutch

consists of from five to 17 eggs averaging 11. It usually takes two weeks or longer to complete the clutch and about 28 days of incubation to hatch the eggs. Most nests apparently hatch in late May and early June.

The hen is very shy during the egg laying and incubation periods. She may desert the nest rather easily if disturbed during the egg-laying period or during the first days of incubation. Thereafter she becomes increasingly broody, to the point that she rarely deserts during the last week of incubation.

For any one nest, the actual period of hatching and drying off of young is completed within a 24-hour period. The brood will be ready to leave the nest as soon as they are dry and when the weather is agreeable.

A hen produces one brood a year. Renesting occurs, although not to the same degree as with pheasants and quail, and only if she was disturbed early in her first nesting attempt.

Upon leaving the nest a brood usually heads for brushy cover where berries and insects, especially grasshoppers, are plentiful. They begin roosting in trees when they are able to fly, usually at least one month after hatching. During the developmental period, several hens may group together to raise their young. They may be observed in single file moving across a field picking insects — continually alert.

"Families" will flock together dur-

ing fall and winter forming large flocks. Old toms begin solitary lives during winter while young males either form smaller flocks or wander singly. As the breeding season approaches, gobblers compete for hens and will gather harems of two or more.

Turkey hens may possibly breed as yearlings but gobblers usually do not breed until two years of age. However, there are indications that yearling toms will breed in the absence of older toms.

The disturbance or destruction of nests by livestock, crows, skunks, dogs, opossums, raccoons, bobcats, coyotes, eagles, badgers, snakes and man will cause the hen to abandon the nest. Turkey hens manage to hatch about half of the nests initiated which is enough to maintain a healthy population. Flooding accounts for some nest loss since turkeys are inhabitants of river bottoms.

Because of the turkey's size, it's speed on the ground as well as in the air and because of its tree roosting habit, it is generally believed that predation is only of secondary importance as a limiting factor for wild turkeys.

Until the turkeys, both native and transplants, are able to build up a sizeable concentration, many factors may prevent rapid expansion. The small, widely distributed flocks are vulnerable to virtually any whim of nature. With the thinly distributed "native" birds anything can knock production for the year.

Release sites have been selected by the Commission and will continue to be chosen on a basis of suitable habitat combined with the interest and cooperation shown from people living within the area. People exerting some effort in behalf of the program will give greater protection to the released birds.

In selecting release sites with ideal habitat, the Commission looks for large, remote tracts of land, preferably from 5,000 to 10,000 acres with a widely distributed supply of surface water. The larger the tract, the better site it makes as it provides for subsequent population increases.

The ideal site calls for sandy soil

with wide belts of good mature roost trees. The land should be interspersed with grass and agricultural crops to provide food-producing vegetation and sufficient cover for nesting and general concealment.

In addition, release sites are marked by an absence from domestic poultry flocks and are also isolated from any areas where previous introductions of pen-reared wild turkeys have been made.

An absence of domestic poultry flocks is essential for two main reasons; to prevent wild turkeys from obtaining domestic fowl diseases and to prevent crossbreeding. During the nesting season and other times, wild toms will call tame hens away from farm and ranch yards or tame toms will call wild hens into the farm yard. The result is usually a half-wild turkey which has lost its desirable characteristics both for surviving in the wild and for hunting.

For the reasons listed, wildlife clubs and private citizens are discouraged by the Commission from buying other turkeys for bolstering Commission released flocks.

To obtain release sites, the Commission and landowner, or cooperator, sign a cooperative agreement. Under it's terms the cooperator agrees to permit Commission personnel on the land for live trapping of surplus turkeys and to conduct biological checks on the wild turkey population. The cooperator, under the agreement, is to grant hunting privileges during declared open seasons on the species when Commission personnel determines there is a huntable population. However, such power to grant hunting to individuals remains with the cooperator.

New releases, combined with continued outstanding reproduction, may result in the Commission's long term goal—that of providing a hunting season for Kansas nimrods within a few years.

It's entirely possible that before long Kansans will be sitting down to a turkey dinner on Thanksgiving counting another blessing—the privilege of having the all-American bird restored in the wildlife and hunting picture of the Sunflower State.

36 More Turkeys Stocked in Kansas

An additional 36 wild-trapped turkeys, obtained from the Oklahoma Department of Wildlife Conservation, were stocked at three Kansas sites in early March.

The sites are at Pierceville, near Garden City, on the Arkansas River; at Gaylord, on the north fork of the Solomon River, in Smith County, and near St. Francis, on the Republican River.

In exchange for the turkeys, Kansas will provide from one to three million walleye eggs to Oklahoma during its walleye milking operation at Webster Reservoir this year.

The turkey and walleye exchange was arranged some time ago by Wendell Beaver of Oklahoma and George Moore of Kansas, directors of the two state wildlife agencies.

New Boating Film

The Kansas Forestry, Fish and Game Commission has acquired a new boating safety film, "Suddenly Upon the Waters." The 16mm sound movie is available to all interested groups for public showing.

The film was produced in color by the Outboard Boating Club of America in the interest of safer and more courteous boating practices. "Suddenly Upon the Waters" tells, in a graphic way, the story of today's crowded public waters and what can be done to make boating more pleasurable. It is an entertaining film for any group interested in outdoor activities.

To obtain this film for a scheduled showing, inquiries should be addressed to the Film Library, Forestry, Fish and Game Commission, Box 1028, Pratt, Kansas 67124. Requests should be made at least two weeks in advance of the desired showing date.

Antelope Play in Kansas

"And That Song Ain't So

By ROY MILLER

Bill Hlavachick must have been of sound mind in 1962 when he accepted the job to head Kansas' antelope project. But it's doubtful the big game biologist fresh out of Colorado State University knew someday he'd be chasing pronghorns as part of an "army" across the Sand Hills of Nebraska. Bill Peabody was hired by the Kansas Forestry, Fish and Game Commission at almost the same time to study birds. As for Glen Davis, he has been manager of the Maxwell Game Refuge since 1958. Davis was too worried about feeding buffalo and elk to be concerned with antelope.

Antelope? Why, isn't that animal just a prominent part of the official state song?

The pronghorn was known largely in Kansas because of "Home on the Range." People didn't really think Kansas was "where the deer and the antelope play" when Hlavachick, Peabody and several other specialists were hired to upgrade wildlife management in the state.

But, it was discovered, the state had enough deer to support hunting. Two successful seasons are history.

The wild turkey program is going good. Someday Kansans may not have to go to Nebraska, Oklahoma or Missouri to shoot their Thanksgiving bird.

And there might even be an antelope season in Kansas someday. At

least Hlavachick was hired to direct the work toward that end.

As one of his first duties, Hlavachick tried to determine just how many antelope were in the state. By aerial and ground observation, 56 were spotted in Wallace and Sherman counties.

Through stockings in 1964 and 1966 (see KANSAS FISH & GAME, Winter, 1966), the state antelope herd included nearly 200 head. Moderate to excellent reproduction had been reported and even the more pessimistic could see another big game season at some future date.

The time is January 9, 1967. The sun is just beginning to light the sky in snow-covered Western Kansas. It was the day after the close of pheasant season. So, of course, the ring-necks were plentiful along the highway. Near Oakley, a deer in a wheat field watched four cock pheasants feed.

Even if they talked about the pheas-

ants or the deer, three Kansans' thoughts were on antelope. Hlavachick, Peabody and Davis were thinking about the pronghorns they hoped to trap at the Sioux Army Depot near Sidney, Nebraska, and then stock in Kansas.

Getting their first look at the Army depot, the Kansans had never seen such tame antelope. Hlavachick had to whistle or beat on the side of the truck door to make the animals raise their heads. With Peabody taking pictures, Hlavachick walked within 15 feet of one group of 20.

There were few visions of an easy time trapping the animals. The biologists realized the depot covered 36 sections—23,040 acres. The animals were scattered. And, the men reasoned, wild antelope might be easier to dive into a trap.

That night, Harvey Suetsugu, district game supervisor at Alliance, Nebraska, talked about the depot herd. At the Army's request, the antelope were moved from Pueblo, Colo., Army Depot to Sidney in 1958. The animals became a study herd. One of the biggest studies came in the winter of 1963-64 when a big



THE DRIVE started in the administrative area of the Sioux Army Depot. Although they kept their distance, the antelope didn't seem too disturbed by Bill Peabody's state truck. (Photos by Roy Miller and Perry Riddle, Topeka *Capital-Journal*.)

Very Far From Wrong"

"die-off" occurred. Poor grazing land was a big factor. Biologists pointed to malnutrition as the culprit.

Since the depot was being phased out, Nebraska had to move the antelope. The Cornhusker state already had enough of its own. Suetsugu told Hlavachick about the animals at a national antelope conference at Denver, Colo., in the winter of 1966. Kansas wanted the animals.

Cooperative agreements were signed between landowners and the Kansas Forestry, Fish and Game Commission for the animals' range. Other necessary arrangements were made and now the Kansans were in Nebraska after the antelope.

Tuesday, the second of the five days in Nebraska, the trap was constructed under the direction of Karl Menzel, a senior game biologist of the Nebraska Game, Forestation and Parks Commission. The Kansans, besides providing some labor, watched intently for the day they might conduct a similar operation in Kansas.

Basically, the trap consisted of nylon netting spread over an iron framework. It was 96 feet long and 48 feet wide at its widest point. Even the gates were covered with netting so the animals wouldn't kill themselves in excitement to escape.

Hog-tight fencing led away from one end of the trap. One wing of about 50 yards connected with an existing chain-link fence to form one side of the irregular "V." The other wing wound its way up and around the crest of a hill for nearly half a mile.

(Continued on page 14)

(EDITOR'S NOTE: Roy Miller, author of the two articles on antelope in this issue of *Kansas Fish and Game*, is a veteran outdoor writer. He has been outdoor editor, assistant state editor and a sportswriter for the *Topeka Capital-Journal* at Topeka for several years, after attending the University of Kansas. He is a member of the Outdoor Writers of Kansas, Great Rivers Outdoor Writers and Outdoor Writers Association of America. His paper assigned him—at his own request—to accompany the Kansas Fish and Game Commission crew to the Sioux Army Depot in Nebraska to cover the trapping and subsequent transplanting of antelope in Kansas.)



A SMALL gathering of townspeople was on hand when 33 antelope were released south of the Arkansas River near Kinsley. Some of the spectators were landowners who had signed cooperative agreements with the Fish and Game Commission.

He'll Have a Tall Story To Tell His Grandchildren

By ROY MILLER

Someday, when my grandchildren go antelope hunting in Kansas, I'm going to tell them about the good ol' days when their grandpa was part of the state's effort to upgrade big game hunting in the state.

Actually, I went to Nebraska to write about other people chasing antelope. I had great visions of sitting back and taking notes and snapping pictures for a story in *Midway*, the Sunday magazine of the *Topeka Capital-Journal*.

I wanted to see first-hand how the Kansas Forestry, Fish and Game Commission goes about building the state's antelope herd. I found out—and became an antelope herder in the process.

The first indication I was an integral part of the operation came the second day. I held one end of the tape measure as the crew started constructing the trap.

The third day I was in my glory. Thinking we could move the stubborn pronghorns better if we were on foot, some of us jumped out of vehicles. When the animals made a break in the wrong direction (at least to our way of thinking), I discovered my shouting and waving arms wouldn't stop them.

After herding them on foot and as a passenger in a truck, I have no argument for the statement that antelope are the second fastest animals in the world.

When the workers started bulldogging the antelope in the trap prior to loading the fourth day, I pretended to be too busy focusing the camera to work. I'd seen one animal bloody the lip of one of the Nebraska game biologists. And I watched Bill Peabody nearly lose an eye when one determined buck reared back.

So I stayed on the sidelines. But I wasn't alone. Harvey Suetsugu, the Nebraska district game supervisor who let Kansas know the animals were available for stocking, kept his distance, too. You see, he's allergic to antelope.

Antelope Play in Kansas

(Continued from page 13)

If everything worked as planned, the antelope would be driven in the general direction of the trap, which was hidden by a hill. The animals would run along the long wing toward the trap. Finally, they'd reach the part where the two wings converged.

The workers, in the meantime, would be in pursuit in automobiles. They would hop out of their cars and trucks when the animals reached the "funnel" and throw up two back-up fences before shoving the animals on into the trap and closing the gates.

It was as simple as that. And, once

the workers moved the animals to the long wing of fence, it did go pretty much like that. Getting the animals to the general vicinity was something else.

And that matter came Wednesday. It took nearly two hours to move 70 animals out of the main building area of the depot. Many of the antelope had been born right amidst the drab buildings. It was evident they didn't appreciate being moved from their favorite weeds.

If the antelope decided to change direction, neither vehicle or "herders" on foot could stop the Gale Sayers of the animal kingdom. Vehicles hit 40 mph over the rugged terrain and still couldn't contain the speedsters, the second fastest in the world.

It was late afternoon that Wednesday before any antelope were moved to the trap. But, by the time the workers left the depot, 76 were in the trap. Thirty-eight more were "captured" on Thursday.

The biggest excitement came when the antelope were diverted by the long wing. Then grins lit up the faces of the workers as the vehicles converged for the "kill" with the low-flying airplane providing the most effective pushes.

A major stationed at the depot was standing on the running board of an U.S. Army pickup, shouting and stomping. Others were beating on car doors and one game protector's siren whined to keep the animals moving. In the excitement, Peabody



ONCE THE ANIMALS were moved into the trap, workers had to bulldog the animals, so to speak. The antelope would leap high against the nylon netting in the effort to escape the trap. The animals apparently didn't want to leave the Cornhusker state.

didn't see a nasty ditch and his truck suddenly became airborne for a brief moment.

"Man o'mighty," Davis said later. "I don't know if you knew it, but when you were pushing that bunch across it looked like an army coming over the hill. The dust!"

And when the animals were in the trap after the biggest drive, 27 smiling men were on hand. Leonard Spoering, the pilot, wore a satisfied look. But he'd never experienced so much trouble before. "These antelope," he said, "aren't wild enough."

Once the animals were trapped, they were blood tested, checked for sex and age and marked for observation in Kansas. Then they were loaded onto an oversized livestock truck and the long trip back to Kansas.

At 6 a. m. on Friday, the fifth day, 50 animals leaped onto a hay-bale platform and scampered across the Kansas prairie near Kanopolis Reservoir in Ellsworth County. Under a bright sun in the sand hills south of the Arkansas River near Kinsley, 33 more were released at mid-morning. That night, 20 more were released at Davis' refuge near Canton.

With the antelope from Nebraska, Hlavachick estimated the Kansas antelope population at more than 300 head. The effort to keep the animals from extinction was making progress.

Now it's up to the antelope.

"These two stockings from Nebraska may complete our stockings from other states," Hlavachick said. "What we're going to do now is watch how our herd builds and then transplant within the state. This probably will be the last time we'll trap outside the state."

The Kansas big game biologist will be watching "how they reproduce, how they extend the range."

Nebraska's antelope population has prospered by transplanting the animals within the state. Game officials estimate about 1,000 head were "transplanted" within the state in about 25 different trapping operations. Now, the state's herd totals nearly 7,000.

The first hunting season came in 1953. In 1966, 1,275 permit holders killed 1,059 animals for a success ratio of 83 percent. The highest unit re-

ported 90 percent success, the lowest 57.3 percent.

"The antelope permits go faster than any other permits," said Lloyd Vance, chief of Nebraska's game division.

The same might be true in Kansas someday. Hlavachick says it will be a "minimum" of five years before there's any antelope season. And the first season will probably be on a highly-limited basis.



PRIOR TO LOADING the antelope on a truck, the animals were processed. With three of the workers holding the antelope still, the animal was ear tagged.

Operation "Walleye"

Men With a Mission

By THAYNE SMITH

STOCKTON—Their occupants bundled against the chill north wind, the two small, flat-bottomed boats skimmed hurriedly across the choppy waters of Webster Lake. The men were on a special mission, and there was reason for their speed. The cargo they carried was alive, and precious. How well they carried out their job in the next few minutes, hours and over the next two weeks might well determine whether a lot of Kansas sportsmen were to enjoy untold thousands of fishing trips in the future.

It was the start of another year's "operation walleye" at Webster—the beginning of the many tasks necessary to provide Kansas lake waters with this battling and highly desirable game fish.

Manning the boats were biologists and game protectors of the Kansas Forestry, Fish and Game Commission. By this time (late March, 1966) they knew their task well, because it had become a yearly ritual with them. They were and are now experts at netting, "milking" and hatching walleye.

The task starts, of course, with the use of the flat-bottomed boats to set long, hoop-type nets along the rocky rip-rap of the dam at Webster, the prized spot for the big walleye in the lake to lay their eggs.

The secret, in turn, is to prevent natural spawning by the fish, to catch them while they are "ripe" for reproduction, but not quite ready to drop eggs and sperm; to "rob" them, if you please, of their eggs; to hatch the eggs artificially in a portable hatchery, and in turn, finally, to stock the fry, or very young walleye, in the various lakes of Kansas.

Why all this trouble? The answer is simple. Through the knowledge that man often gathers in years of research, biologists and fisheries experts have learned to take the walleye eggs and do a much better job of hatching them artificially than Mother Nature can do naturally.

Once the big hoop nets are set, just right, perpendicular to the dam so

morning, and their ends untied to take the trapped fish, gently, from them.

that the prowling and ready-to-spawn fish will become entrapped but unhurt, the process is well underway. Now, the nets must be "run" each

Out of the net, they are divided by sex (yes, the biologists can tell males from females just by looking) and placed in washtubs filled with cold lake water inside the flat-bottomed



FINE SPECIMEN—John Ray, Pratt, fisheries biologist, displays nice female walleye before she is released back to the cold waters of Webster Reservoir. Fish this size often yields a pound of eggs for hatching.

boats, for transportation to the "milking" site.

The milking operation takes place on a rock bar across a cove from the dam at Webster, where a bluff and hill provide a little protection from the north wind, where the water is shallow enough that the workers can wade it with hip boots, and where the eggs can be extracted and washed quickly and accurately.

Arriving at the scene, the men in the boats, with their cargo of large, freshly-netted walleye put the fish into individual pens, again by sex, made of chicken wire and half-submerged in water.

Then, someone like Jerry Bump, game protector from Smith Center, takes them out one-by-one, a male then a female, and hands them to the "milker," who relieves them of their precious, life-giving commodities—sperm and eggs. The "milker" is Clyde Ukele, game protector from Norton, now an experienced hand at the walleye operation.

Sitting on a small bench, which he long ago dubbed his "milking stool," he grasps a fish firmly but gently, its head locked under his right arm, and its tail in the clutches of his left. Then, he firmly presses the underside of the fish with his right hand, and the eggs or sperm, spill forth into a small pan sitting on the milk stool in front of him. In a two-week period, he will spend many hours putting more than 1,000 fish through this ritual.

Once the fish are "milked," Ukele hands the painful of eggs-sperm mixture to a biologist, like John Ray of Pratt, who quickly mixes the entire contents with some liquefied, gray-colored clay. This process is used to remove a stubborn, adhesive-like stickiness from the eggs, allowing them later to be suspended and tumbled individually in the long, tedious hatching process.

Almost as quickly as it is applied, the clay must be washed from the eggs, before it can cause them damage, and to complete the process of removing the adhesive and excess sperm. This is accomplished in a sieve-like affair by Frank Shryer, Hays, another fisheries biologist, who handles the eggs with the greatest of



DELICATE JOB—Eggs stream from female walleye as the gentle and practiced hands of Clyde Ukele, Norton game protector, apply just the right amount of pressure. After "milking," fish are released, none the worse for wear.

care and tenderness, like precious stones.

With the washing operation completed, the eggs are dumped into large plastic containers, resembling buckets, for transportation to the portable hatchery. The hatchery, an old "traveling exhibit" semi-trailer van which roamed the state for many years carrying the Fish and Game conservation message to thousands, is parked at the Webster spillway area.

The complexion of the van has changed over the years. The exhibit areas, pens and individual aquariums are gone. In their places, there are

row after row of long, plastic contained of about two-gallon capacity each. Each is arranged under a faucet, and has a small plastic hose running from it, allowing continuous water circulation—with the water pumped from the spillway pool to the van—through each container. The water pouring from the containers spills through a series of fine screens, arranged below in big, stock-type tanks. The screens later catch the small "fry," "eyes" or freshly-hatched eggs as they spring to life, go to the top of the jars and seek to swim away through the plastic hoses.

Depending on the number of fish

trapped per day, their size and the number of eggs milked from the females, several thousand eggs are placed in each of the plastic containers, there to bounce, to bubble and tumble for a number of days until time and temperature are right for them to hatch and become real-live, minute fish.

Once the hatching process starts, trucks of the Commission, equipped with 150-gallon water tanks with temperature controls and always-churning aerators to supply precious oxygen, converge on the hatchery to pick up the prized, milling, wiggly new-born fish. Quickly and swiftly, they are delivered to the lakes, where stocking has been pre-arranged, planned and scheduled for many months—with just the right numbers to be delivered for the size and needs of the lake.

It goes without saying that “operation walleye” has grown through the years in Kansas, since started in 1957. Last year, it produced a whopping 32 million eggs, with a hatch of almost 60 percent, for stocking of big lakes. In fact, the results were so good last year that biologists placed a few of the walleye in seven small state lakes in Kansas, in an effort to determine if they might survive and grow in smaller bodies of water. The small lakes, of course, were chosen in advance, with deep, clear lakes picked for this particular experiment.

Once the fry are stocked, time has shown that the walleye do well in most big Kansas lakes. In new waters, growth is extremely rapid, sometimes a pound a year or more. The present state record is a 10 pound, 8-ounce specimen from the outlet at Kanopolis, caught in 1961 by Roy Laster of Hutchinson.

The biologists and game protectors who carry out “operation walleye” at Webster know, however, that bigger walleye are awaiting anglers in Kansas waters. Last spring, for instance, they netted a whopping 13½-pounder from Webster—a female containing almost three pounds of eggs. With walleye eggs—which can be described only as tiny—weighing about 75,000 to the pound, this mother fish made a giant contribution to the fu-

ture fishing of Kansas. Imagine, 225,000 eggs from one fish!

The milking and hatching process to the casual observer is unusual, and produces many different, if not unique, items. The spawning of the walleye generally starts about the last day of March, and continues to mid-April. At its peak, the nets may produce as many as 200 fish per day, but the number of males generally runs much higher than females. The netted fish average from four to five pounds, according to Shryer who heads the project each year for the Fish and Game Commission.

“We have operated in water tem-

perature of 48 degrees,” he said, “but it’s most desirable to take the fish with the temperature at 51 to 54 degrees.”

The nets, Shryer said, are set from four to 12 feet deep along the dam, and are checked once each day.

The hatchery, a makeshift affair constructed from the old van with a lot of hard work and no direct money appropriation, has served the Commission well, but has many drawbacks.

“We don’t have the temperature control we’d like,” Shryer said. “If we had a constant temperature, the eggs would hatch in about 15 to 17 days and we could plan our stocking



WASH JOB—John Ray, Pratt, left, and Frank Shryer, Hays, both fisheries biologists, gently pour processed eggs from plastic tub into large container for quick shipment to portable hatchery.

schedule right on the money. Without control, the water temperature changes with the weather, and we never know when we might be caught with a big, sudden hatch. If we get in trouble, we just start calling and get all the trucks here we can and get the fish stocked as quickly as possible."

What happens if the fish hatch and you don't get them out?

"After a short time, they start 'chain-ing up'—trying to eat each other," Shryer said. He went on to explain that the tiny, hatched "eye" can live on the egg yolk for a short time, but then must start foraging for itself. If it is not stocked in waters where there are microscopic organisms of food, like plankton, cyclops, copepods and others, they will try to eat each other. This can be imagined when he points out that the hatched walleye is less than $\frac{3}{16}$ of an inch long.

It's hoped, of course, that the artificial hatching process can be eased in future years, and will be supplemented at least, by natural reproduction. However, Mother Nature has not as yet done a real good job of keeping Kansas waters stocked with walleye.

"We know that it takes three years for walleye to spawn for the first time," Shryer said, "and our success in some lakes hasn't been too good for some reason. We don't know just why, but we hope that time may give us some answers. Perhaps our waters are too warm most of the time, and perhaps our lakes don't contain enough of the right kind of habitat for walleye spawning.

"However, we're really not concerned as much about natural reproduction," he added, "as we are in a good survival rate. We know now that it's economical to carry out what we call a 'put and take' operation with walleye in most Kansas waters. Through artificial hatching, we can stock the lakes periodically, and the fishermen can take them out. With an average of 60 percent reproduction on eggs, compared with 10 percent by natural methods, we can keep all the Kansas waters well-stocked with walleye as long as there is a good supply of "milking" fish.

The walleye program has been



THOUSANDS OF WALLEYE EGGS tumble in plastic jars in portable hatchery, where 37 million were hatched and stocked in Kansas waters last year. Walleye operation starts annually in late March. (Fish and Game Commission Photos.)

readily and enthusiastically accepted by the Kansas angler. It has not only given him a fine game and table fish, but has actually opened new avenues for his pleasure.

With the coming of the walleye to the big, new impoundments in the state and their ability to thrive and do well, the angler who will brave a little cold and inclement weather has a "year around" fish to seek.

They've discovered that the big, saw-toothed fish fights as well in winter as in summer, perhaps even better, and that he can be taken at about any time of year by the "good" fisherman.

Fishermen throughout the state find it heartwarming, too, that the program is growing, and that more and more lakes are being stocked each year with these battling northern natives.

There's no doubt the walleye is welcome in Kansas.

Cover Photo

Bundled against a chill north wind, John Ray, Pratt, and Frank Shryer, Hays, fisheries biologists of the Kansas Fish and Game Commission, place large hoop nets in the icy waters of Webster Reservoir, to trap spawning walleye.

The yearly ritual is carried out along the face and rip-rap of Webster dam, where transplanted Walleye have grown large with the years, and produce an abundance of eggs. The eggs, of course, are taken, as related in the "Operation Walleye" story on page 16, for hatching by artificial means and stocking in the reservoirs and lakes of Kansas. (Photo by Thayne Smith.)

Stripers in Kansas

From Saltwater to Sunflower Lakes

By JOHNNY RAY
Fisheries Biologist

The striped bass, rockfish, rock, or surf striper, is it a sea bass or a freshwater bass?

This is the question that fishery biologists are currently trying to answer, and it appears that the answer is "both."

For a number of years, most fishery experts would have called the striper a sea bass; however, in light of recent discoveries, it has been found that the striper is equally at home in either fresh or salt water. As far back as history relates, the striped bass could be found along the Atlantic Coast, from the St. Lawrence River, Canada, to the St. Johns River, Florida, and in the tributaries of the Gulf of Mexico, from Western Florida to Louisiana. The striper was not native to the Pacific Coast and was introduced to California waters in 1879. The adaptability of this fish to the Pacific Coast was nothing less than phenomenal, and within a few years, hundreds of stripers were being taken by both sport and commercial fishermen.

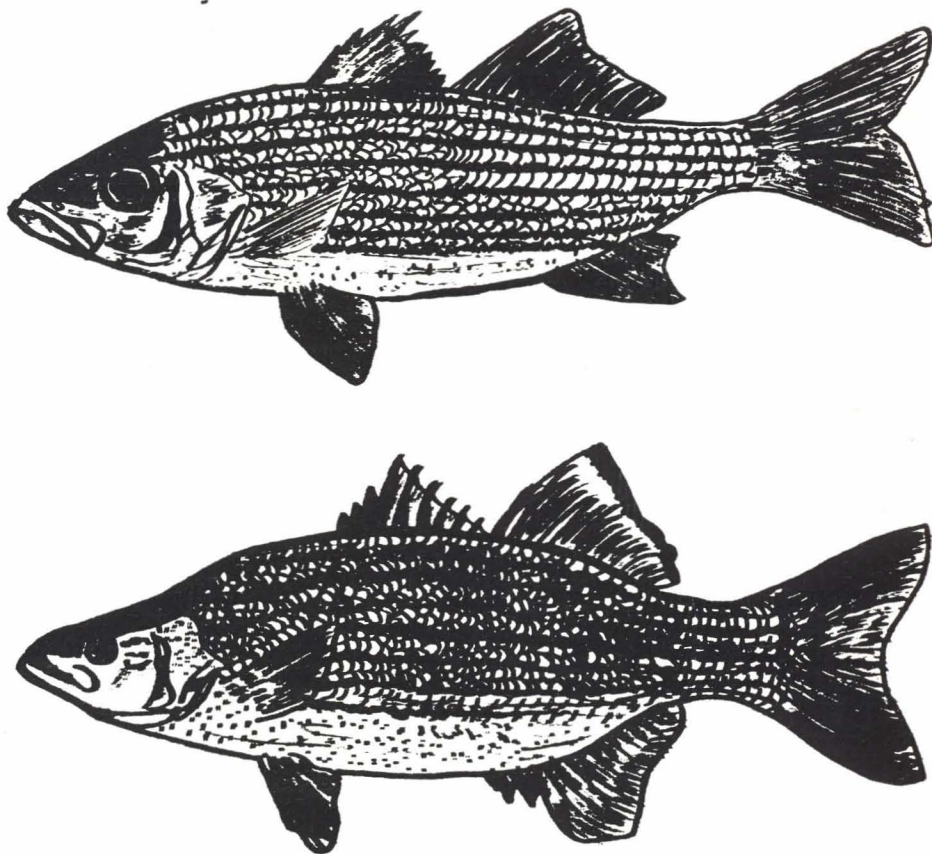
In one aspect, the striper has always been a fresh water fish in that it spawns in fresh water. During the late spring when the river waters begin to warm up to approximately 58° F., the stripers along both coasts begin to ascend the coastal rivers to spawn, often traveling many miles upriver. Large numbers of eggs are released by the parent fish and these eggs, although slightly heavier than water, are kept bouyant by the current in the rivers. The eggs hatch while en-route down river and in water possessing a temperature greater than 65° F., the eggs hatch in less than 72 hours.

Perhaps the first landlocked population of striped bass to be found in the United States was established in the Santee-Cooper Reservoir located near Charleston, South Carolina. During the year 1941, two South Carolina Rivers, the Santee and Cooper, were

impounded some miles inland to form a 160,000-acre reservoir. Striped bass normally using the Santee and Cooper Rivers for spawning, became landlocked behind the huge dam of the reservoir and could not return to the sea. For a few years following impoundment of waters in the reservoir, it was not apparent that the stripers were increasing in numbers; however, increased fisherman harvest and fish-

ery surveys indicated that the stripers had become very abundant.

Further fishery studies revealed that the stripers were reproducing large numbers of young in the rivers above the reservoir, and that these fish and their young were living their entire lives in the reservoir without returning to the sea. Confronted with the knowledge that the striper would survive when confined exclusively to fresh water, fishery biologists began to ask the question: "Why wouldn't this fine game fish survive in more inland fresh waters?"



RELATED—BUT DIFFERENT!—Drawings show in detail some primary differences between the striped bass and its cousin, the white bass. Most noticeable difference is the shape of the head. On the white bass the head is markedly depressed while the striper's head is more bullet shaped and lacks the depression. The body shape also differs with the striper's body more elongate and little compressed. Depth of the body on the striper is usually less than one-third the standard length. On the white bass the body is deep and compressed with body depth being more than one-third of the standard length.

South Carolina fishery biologists began to work earnestly to find the answer and established a striped bass hatchery below the Santee-Cooper Reservoir. Since the building of the hatchery in 1961, millions of striped bass have been hatched artificially and have been stocked in the reservoirs of South Carolina as well as other states.

Before any puzzle can be solved, one must find the missing links and this is basically true when introducing any fish to a new and somewhat different environment. The stripers when hatched are very small in size, delicate to handle and the survival of fry is very low, especially when the fry are introduced to an impoundment with an established fish population.

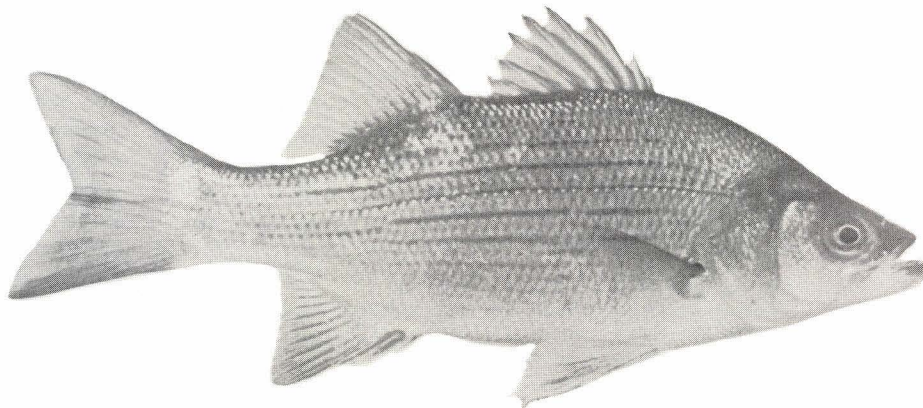
If good survival is to be attained, the fish must be of much large size so that they can escape predation from other fish and also compete with other fish for natural food. The Wildlife Resources Commission of South Carolina has initiated a study with other states to determine if the striped bass fry, when placed in ponds, can be successfully reared to a much larger "fingerling" size, and in sufficient numbers to satisfy stocking needs. Kansas Forestry, Fish and Game fishery biologists are participating in this program and have successfully reared a small number of striped bass to fingerling size. These striped bass are being retained at the Commission's hatchery at Pratt, to determine if the fingerlings will continue to grow and also to determine if the fingerling striped bass can survive the cold waters of Kansas during winter.

Small numbers of striped bass above those which were used in the rearing study have been stocked in three new Kansas reservoirs. During 1965, striped bass fry were stocked in Wilson Reservoir, which is located near Russell. During 1966, others were stocked in Wilson, John Redmond Reservoir, which is located near Burlington, and Elk City Reservoir, located near Independence. Considerable time will be required before the success of the stocking can be evaluated, as the stripers will not mature and spawn until they are at least four years of age.

Providing that Kansas Forestry, Fish and Game Commission fishery biologists can obtain a steady source of striper fry and that they can be successfully reared to fingerling size, it is very possible that the fish can be established in many Kansas reservoirs. Many questions relative to the fish are as yet unanswered and more research must be done to determine if the fish can tolerate the cold waters of Kansas, reproduce in Kansas river

systems and also obtain satisfactory growth without adversely affecting other game fish in the reservoirs.

Before proceeding further, perhaps it should be explained just what a striped bass is and also why it is desirable to both anglers and fishery technicians. The striper is a member of the sea bass family, Serranidae, as are the yellow bass, the white perch and the white bass. The color of the striper is a brassy silver with seven



DISTINCT DIFFERENCE—Photographs of a striped bass and white bass reveal a marked distinction as far as back shape is concerned. The striper's back lacks arch while the contour of the back on the white bass is considerably arched. Also note difference in stripes and clarity of markings.

to eight longitudinal dark stripes, which extend from the back of the gill covers to the base of the tail fin. The young of the striped bass and its relative, the white bass, can be easily confused; however, there are marked differences in the shape and body structure of the two fish. To the untrained eye, these differences might not be apparent, so both fish are described as follows:

A Comparison of the White Bass (*Roccus chrysops*) and the Striped Bass (*Roccus saxatilis*):

White Bass

1. Teeth on the base of the tongue are in a single series.
2. Body deep and flattened, depth more than one-third the length from the front of the snout to the base of the tail.
3. Contour of the back considerably arched.
4. Soft rays in the anal fin, 12 to 13.
5. Head at the nape markedly depressed.
6. Soft rays in 2nd back fin, usually 13.
7. Lateral line scales, scales number 52 to 58.
8. Weight very seldom exceeds five pounds.
9. Parr marks found on small white bass are most often very faint and much less distinct than those on striped bass.

Striped Bass

1. Teeth on base of tongue in two parallel patches.
2. Body elongated, little flattened, depth less than one-third the length from the front of the snout to the base of the tail fin.
3. Contour of the back little arched.
4. Head at the nape not notably depressed.
5. Lateral line scales, 57 to 67.
6. Soft rays in 2nd back fin, 11 to 12.
7. Soft rays in anal fin, 10 to 11.
8. Distinct Parr marks in fish less than six inches in length.
9. Fish may attain a weight in excess of 50 pounds.

Striped bass, dependent upon the amount of available food and space, grow to a large size. The striper as taken from the ocean, has been reported to have attained a weight of 125 pounds and a length of 6 feet. In fresh water, it is expected that a striped bass that would attain a weight of 50 pounds could be considered an exceptional fish. Land-locked stripers such as those in the Santee-Cooper Reservoir grow to over 50 pounds in weight and fishermen take many stripers from the reservoir which are about 30 pounds in weight.

Most female fish mature at four to five years of age and male fish mature at two years of age. Striped bass in proportion to their size spawn large numbers of eggs. A six pounder may spawn as high as 250,000 eggs while a fifty pound fish may spawn 3,000,000 eggs. Spawning beds may be located from 30 to 100 miles up river, depending to a great extent on how much current is present in the river and also to what degree the river is polluted.

The striped bass is a free spawner and quite a ritual takes place while the fish is spawning. The females are usually surrounded with as high as 20 male fish, and as she begins to release eggs, the males emit milt to fertilize them. This spawning activity is characterized by much thrashing about of the spawning fish, and often the males crowd the female so closely that she is forced up out of the water. The spawning activity is referred to by some as a "rockfish fight."

In order for the eggs to remain suspended and prevent settling to the bottom, they must be spawned in water with a sufficient current to keep them suspended. The amount of water current in the spawning beds is probably one of the most important factors relative to the success of egg hatching. A lack of sufficient current would allow the eggs to settle to the bottom where they would become silted in and lost due to suffocation. However, the current cannot be so fast as to traverse the course of the river before incubation takes place and the eggs hatch. Dependent upon the water temperature, the eggs may require from 24 to 72 hours to hatch.

The striped bass is a voracious, carnivorous fish which has a high rate of digestion and a huge appetite. The fish feed rapidly and members of a school most generally feed about the same time. Striped bass feed upon many kinds of fish, however, they tend to prefer soft fin-rayed fishes such as the gizzard shad. Small striped bass feed heavily upon small

animal organisms in the water until they reach a length of approximately four inches, and at this length begin to feed upon larger organisms such as aquatic insects and small fish. Striped bass grow rapidly and in reservoirs with large numbers of forage fish, the striper attains from three to five pounds of weight each year.

Only an angler who has caught striped bass can describe the gameness of this fish, and they say that the battle is not easily won. One does not pursue the striper with light spinning tackle and even heavy tackle must be used with certain finesse in order to successfully land the fish.

The striper does not give up easily and the fish exerts all its strength into the fight. Many stripers are lost shortly after being hooked, as they dive to the bottom and it requires a strong hand on the rod to turn them, especially if the fish weighs from 30 to 40 pounds.

The flesh of the striped bass makes excellent table fare and is prepared in many ways. Owing to the large size these fish attain, one big striper can provide a meal for a large family whether cooked, baked or fried.

From the standpoint of fisheries management, the striped bass is a highly desirable fish. It is an excellent predator and may serve as a means of suppressing the large numbers of rough fish found in Kansas reservoirs.

Generally, in any reservoir fish population, smaller rough fish are easily eaten by such predators as the walleye, northern pike and largemouth bass; however, these fish are not large enough to ingest large forage fish. A large striped bass can ingest carp and gizzard shad which weight several pounds, therefore, some control of larger forage fish can be attained.

Again, it must be reiterated that it may be several years before a population of striped bass can be established in Kansas reservoirs and lakes. Much more study is required to develop methods for successfully rearing the striper to fingerling size and also a steady source of supply must be obtained.

The Prairie Drummer

(Continued from page 5)

intently made notes, I wondered what caused the fight. When it ended, I quickly saw the reason. The victorious male changed his dance abruptly and a new call—a rapid “kwork, kwork, kwork” with spirited dancing and booming and hopping—split the air. Then I saw it—a hen was approaching the ground. She was demure and appeared to completely ignore the frenzied activity she had caused, just feeding and pecking at something in the short grass.

She ambled slowly to the ground, still pecking leisurely at unseen items. Two cock birds fell in slightly behind and to her side, following her across the ground. Dancing and booming with all their might, one of the cocks approached the hen, but she simply ran a short distance and the cock was challenged by another, and a second fight ensued.

The unconcerned hen continued on across the area, several cocks approaching her, but all rebuffed. As she walked slowly away, the spirited activity diminished, and it was evident that the hen was not ready for mating.

The sun warmed quickly and the bright sunlight soon slowed boom ground activity. The cocks seem to slowly lose interest and began occasionally to peck at bugs and seeds in the grass. Finally, there was less and less defense of their chosen areas and the group began drifting off the ground, walking slowly, stopping often to feed. About fifteen minutes later all had ambled around a limestone cliff, down a ravine, and out of sight.

I left the car and walked over to the ground. The short buffalo grass was broken and badly trampled. Numerous body feathers were strewn about the area to attest to the territorial fights that has taken place.

Why had the birds chosen this particular spot? Perhaps there were several reasons not obvious to me. However, here was a point that could be seen for almost a mile in any direction. Only short grass grew here,



“Best rabbit dog in the state, ma’am.”

Pollution Takes Big Fish Toll

Water pollution resulted in the death of approximately 1,144,500 fish during calendar year 1966, according to the annual pollution-caused fish kill report filed by the Kansas Forestry, Fish and Game Commission with the Federal Water Pollution Control Administration. “The estimated 1966 kill was substantially higher than that recorded in 1965 when approximately 570,000 fish were lost from pollution,” Roy Schoonover, chief of the fisheries division for the Commission, said. Minnows were included in the estimated

because of a thin layer of soil underneath, barely covering layers of limestone that formed the outcropping cliff around the edge of the hill.

This made an ideal floor for dancing. No doubt it had been this way for countless years.

As I left the ground, I wondered how long prairie chickens had danced on this spot. Perhaps many Indians had also observed this special spectacle on the same ground years before.

I wondered if they might have approached the area by crawling on hands and knees in wet grass.

Certainly, they weren't lucky enough to observe it from the comforts of an automobile. . . .

fish kill as well as larger fish.

Commission personnel investigated a total of 23 fish kills during the year—15 of which were attributed to agricultural operations. Manure drainage from feedlot operations was the principle cause of a large number of fish kills in this category.

The two largest fish kills both occurred near Emporia on the Cottonwood-Neosho river system when an estimated 300,000 fish were killed in March and another 300,000 fish were lost in September.

The kill in March was more damaging than most as it occurred in a section of stream immediately above John Redmond Reservoir resulting in a higher percentage of dead game fish. Nearly fifteen percent of the game fish lost in this kill were walleye.

The other fish kills were attributed to cheese plant wastes, chemical plant wastes and petroleum products which escaped into streams primarily from pipeline breaks.



A PAIR OF WINNERS—Pretty Nancy Kinnamen, Kansas City, queen of the 1967 Kansas City Boat, Sports and Travel Show, poses at new Kansas Fish and Game Commission exhibit booth. Booth will also be at annual Wichita Boat, Sports and Travel Show April 4-9, at Wichita State University fieldhouse. (Fish and Game Commission Photo.)

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