KANSAS FISH AND GAME

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KANSAS FISH AND GAME

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THE KANSAS FORESTRY, FISH AND GAME COMMISSION

Pratt, Kansas

LEE LARRABEE, *Chairman*

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Tularemia—Rabbit Fever

This is the time of year when cases of tularemia, or rabbit fever, are usually reported with increasing frequency to the Kansas State Board of Health. With the arrival of cool weather, men and boys shoot and dress rabbits, and housewives prepare them for cooking, thus exposing themselves to the germs causing tularemia in humans, if the rabbits happen to be sick with this disease, and their germs find entrance into the human body through an opening, such as a small cut or other abrasion in the skin.

During the last fifteen years, 1927-1941, inclusive, 479 cases and 30 deaths from tularemia have been reported in Kansas.

Tularemia is caused by a germ found principally in infected rodents. Since wild rabbits are the chief cause of human infection, tularemia is commonly known as "rabbit disease," although it has resulted from the bites of ticks, deer flies, stable flies, squirrels and fleas.

Usually, when the disease is caused by a rabbit, some injury has occurred, allowing the germs to enter the blood stream. In such a case, an ulcer usually forms at the site of injury, accompanied by enlargement glands that drain the ulcer. The primary lesion may be on the eyelids, or on other parts of the body, when the disease is caused by a tick or fly bite.

The disease occurs with fairly even frequency among men and women—since men often dress the rabbits they have killed, and women handle them while preparing them for cooking. Therefore, the state health department warns both men and women of the dangers of handling wild rabbits.

The onset of tularemia is usually marked by a headache, chills, body pains, vomiting, pain at the site of infection, prostration, and fever. Diagnosis of the disease can be confirmed by a blood test.

There is no especial treatment for tularemia. The disease is extremely debilitating, and therefore, complete rest in bed is probably the most important measure to be taken. The illness usually lasts for several weeks, and from the very start, the patient should be under the care of a physician.

The person who takes care of a tularemia patient should use every precaution to avoid becoming infected as the result of dressing the tularemic wounds. Pus from the lesions carries many germs, and should not be allowed to come in contact with the hands of the nurse. Dressings removed from the wounds should be burned.

When thoroughly cooked, rabbit meat is harmless as food, even though the rabbit has been infected with tularemia. It has been learned that a temperature of 133 degrees Fahrenheit kills the germs. *The main danger lies in handling and cutting the rabbit.* A small break in the human skin, caused by a rabbit bone, or careless handling of a knife while dressing an infected rabbit or preparing it for cooking, is sufficient to allow the infection to enter the blood stream, and should be promptly treated with a reliable disinfectant.

If, while dressing a wild rabbit, you notice small, white or grayish spots on the liver, the carcass should be burned immediately, or buried deep in the earth—those spots on the liver, very probably, are tularemic abscesses. Market inspection for rabbits infected with tularemia is impracticable, since very few livers are left in rabbits prepared for the market. Therefore, those who obtain rabbits from the market, should handle them very carefully when preparing them for cooking.

Rabbits kept in cold storage are not necessarily free from tularemic infection, since it has been found that infected rabbits kept in cold storage at a temperature just above freezing may retain the infection for as long as three months.

An excellent precaution for those who dress rabbits, is to wear rubber gloves during all of the handling process. Since one attack of tularemia affords lifelong protection against the disease, those who are thus immune should be employed if possible to dress rabbits.

Never dress or prepare for cooking a rabbit which has run so slowly that it was clubbed to death. Many men and boys consider it a feat of prowess—a demonstration of remarkable speed—when they have run down and killed a rabbit. They need not feel so vain over the accomplishment—since it could not possibly be done with any but a sick rabbit; a well one can outrun any human being. Rabbits sick with tularemia can run for only a short distance—they run slowly, and as the disease progresses finally are unable to run at all. Tularemia is always fatal to rabbits.

In closing, let us reiterate the warning of the U. S. Public Health Service, *"keep bare hands out of wild rabbits."* Also, let us urge that the family physician

be called promptly, when any signs of tularemia appear in order that the patient may have the greatest protection against the serious or fatal illness.—F. C. BEELMAN, M. D., *Secretary Kansas State Board of Health.*

The Third Game Farm Completed During Year

The building of the Meade County Pheasant Farm, a project which was begun in 1940, was completed by the Commission during the past year.

All of the permanent buildings at this farm—two brooder houses, incubator rooms, power plant, administrative offices and employees' living quarters—are of Spanish design and of adobe construction. The nearly 100,000 adobe blocks required for such construction work, were manufactured on the building site by CCC enrollees with homemade equipment and from materials near at hand. The less permanent structures include 180 twelve-by-twelve breeding pens, one exhibition pen and six two-acre hardening pens. Cleanliness, vigilance and closely scheduled work are the precepts that must be followed closely to successfully produce game birds by artificial means and methods. For the information of our readers, we briefly discuss the steps necessary to progress a game bird from the egg to the field.

Into each of the laying pens are placed five breeders, four hens and one cock, at the beginning of the laying season. The average number of eggs produced by a hen pheasant, under such circumstances, is about fifty for the season. The eggs are collected from the pens daily. Eggs settings are so made that a hatching comes off regularly on the same day of each week. The chicks are all hatched in one of the five 3,000 egg incubators now in operation at this plant.

The chicks, on hatching, are immediately placed in battery brooders for one week. The week old chicks are then moved to one of the brooder houses where they are under close observation and where they are regularly fed an approved diet. After four weeks, if the birds have not shown any symptoms of disease, they are then transferred to the hardening pens for muscle and wing development. At nine weeks of age the birds are liberated through sportsmen's clubs, game protectors and other agencies, on areas which have been previously approved by the Commission as an area suitable for game birds.

There follows a tabulation of the bird production record attained by this game farm during the years it was under construction:

Year	Pheasants	Chukar partridges
1940	6,570	1,030
1941	14,764	2,196
1942	16,500	1,500

Slower Speeds to Save Birds

Autoists who conserve tires and gasoline by reducing their speed will also save the lives of many wild birds and mammals, predicts the Fish and Wildlife Service, United States Department of the Interior.

No national estimates of wildlife's highway mortality have ever been made, according to the Service, but the many observations that have been made by individuals show that the losses are tremendous. In one case a Service biologist noted nearly 100 rabbit carcasses a mile over a 2-3 mile stretch of the highway in Utah.

Principal cause of the accidents is without doubt the high speed of automobiles, declared Dr. Ira N. Gabrielson, Director of the Fish and Wildlife Service. Often it is impossible to save a wild life without risking human life or an accident to the automobile. However, in a great many cases even a slight let-up in speed will give wild creatures a chance to be out of danger.

Fur Harvest Will be Smaller

The annual harvest of furs will be smaller this season than previously, for several obvious reasons: The demand for men in the Army, Navy, Marines and defense industries; priorities on steel, preventing the manufacture of traps; curtailment of luxury industries, and low prices being paid for raw furs. Considerable quantities of furs will be taken, but mainly by farm boys rather than the older folk. It goes without saying that boys will not be as efficient trappers as older, experienced men, but they learn quickly, and they will be a great help in the present emergency. There are genuine thrills in trapping fur animals; it pays dividends in cash, in nature lore and in healthful, outdoor recreation. Trapping seasons are based generaly on studies made to determine primeness with resultant top market prices. Poor preparation will result in disappointing returns. Prime pelts correctly skinned, fleshed, and dried bring the best prices in any fur market. If furs are to be shipped to the raw fur market, wrap them in newspaper surrounded by a heavier paper, and tie the package securely. Place a tag, bearing your name and address as well as the name and address of the dealer, raw fur receiving house, or auction company, inside as well as outside the package.

As a patriotic duty and as an aid to the War Program, trappers are being requested, whenever and wherever possible, to turn in fats from pelts and carcasses ordinarily discarded—such as raccoons, skunks, muskrats, and other fur animals. Millions of pounds of fats are left in the woods, swamps and fields of our country by trappers. The collection of these fats and their prompt deposit in good condition can

add much more glycerine to America's supply of the much needed ingredient for explosives. Collection setups to receive these fats are being organized by the State Conservation or State Fish and Game Commissions, and trappers should coöperate to salvage this waste. Trappers are simply asked to contribute to the War Program what they would ordinarily throw away.

Pheasants

The seeming readiness of the ring-necked pheasant to adapt itself to the soil, the improved game coverts and other conditions of western Kansas caused the Commission to devote much of its pheasant stocking efforts to that part of Kansas. That these efforts were successful cannot be denied.

In northwest Kansas the pheasants increased and multiplied to such a degree that during the past year the following twenty-one Kansas counties were opened to a four-day pheasant hunting season: Cheyenne, Decatur, Ellis, Gove, Graham, Logan, Norton, Osborne, Phillips, Rawlins, Rocks, Russell, Sheridan, Sherman, Smith, Trego, Thomas, Wallace, Mitchell, Jewell and Republic.

Although the pheasants showed a corresponding and in some instances a greater increase in other western Kansas counties the Commission could not declare those counties open to pheasant hunting in view of an agreement with the United States Fish and Wildlife Service that provided for the retaining of a closed season in those counties until 1943. The future plans of the Commission proposes the opening of those counties upon termination of the existing agreement.

The Game Conditions

The general condition of our game birds was never more satisfactory than it is today. A survey of the game fields reveals that fact. All specie of upland game birds have shown an increase in numbers and appear to be in a sound and healthy condition.

Many factors are responsible for bringing about this gratifying situation. The game farms have operated efficiently and effectively. They produced birds in such numbers as the commission directed, and the game protectors to whom had been given the responsibility of releasing those birds exercised rare judgment in the performance of their work. They placed birds only on property where the attitude of the farmer justified the releasing of birds and where field conditions were of such a nature that the birds were assured continued protection and a constant supply of feed. An additional factor of equal importance was the Commission's educational program, conducted without fanfare, among the farmers and sportsmen which caused those two groups to alter their opinions of each other and to revise their estimate of the value of game birds to them. The farmers and sportsmen are now actively and jointly engaged in the furtherance of several Commission suggested game restoration programs. The Commission's plan for the next few years include the development of a still greater farmer-sportsmen Commission program of game bird maintenance and restoration.

Prairie Chickens

We are happy to report that a heavy increase in both the greater and lesser prairie chickens was accomplished during the past year. The greater prairie chicken has responded readily to the encouragement that we have given it and has increased so rapidly throughout its eastern Kansas range that the Commission was moved to declare an open season on that bird again during the fall of 1942. Game protectors and other observers, whom we consider to be competent, have declared that the present chicken population of Woodson county alone is nearly 80,000 birds. Less than ten years ago, we would remind you, there was but one known flock of prairie chickens in that county.

The lesser prairie chicken of western Kansas also has shown an increase in numbers, but not to the same extent or as rapidly as the greater prairie chicken of eastern Kansas.

Fish

A special effort was made by the Commission during the year 1942 to increase fish production at its fish hatchery and to improve the fishing potentialities of the state lakes, public streams and other free waters. As a means of increasing fish production two new wells were sunk at the Pratt hatchery. That improvement was doubly beneficial. It is not now necessary to close any part of the hatchery during the spawning season due to an inadequate water supply. Then too, fish can be held in all of the 104 breeding ponds until they have attained adult size before releasing.

The method of distributing fish has also been changed by Commission orders. They recognized that the time-honored custom of giving fish to all persons expressing a willingness to receive them was a needless waste of time, money and fish. A new ruling by the Commission requires that fish are to be delivered only by hatchery employees and directly to selected and approved waters. During the past two years many lakes of private as well as state ownership that were known to be overstocked with fish were seined and fish removed to other waters.

Much attention was also given the matter of improving public streams. Many scientific fish management practices were invoked in that effort. Reports

from anglers have indicated that the Commission's fish program during the past two years has been productive of worth-while results. Despite the fact that there was a heavy increase in fishing license sales and in the number of anglers fishing in our lakes and streams, the ratio of the number of fish caught to the number of anglers engaged was slightly higher than that of the preceding two years.

Propagation of the Spotted Channel Catfish

(*Ictalurus Lacustrus Punctatus*)

The spotted channel catfish has long been held in high esteem as a sporting fish by the Kansas angler. It is equally popular as a pan fish.

The first attempts to raise this fish artificially were made at the State Fish Hatchery, Pratt, Kan., in 1925. Several years later the Oklahoma, Texas, and Missouri game commissions likewise undertook, with considerable success, the artificial propagation of this specie.

The first attempts at Pratt were made upon eggs collected from a submerged boat sunk in a farm pond in Kingman county, Kansas; the eggs were later brought to the State Hatchery for incubation. This first attempt was not very successful. The importance of fanning the eggs, to keep off silt and sediment, the need of forcing water through the eggs, to prevent mold formation, and proper methods of handling eggs and fry were matters that required several years of experience to learn. This paper reports the results of these experiences gained at the Pratt State Hatchery.

Spotted channel catfish in its native habitat is a dweller of our larger streams and rivers. They are active most of the year, but in mid-winter they bunch up and do not move around to any extent. When the channel catfish is brought to hatchery ponds its native surroundings are left behind. Instead of rocks, tree trunks, roots and holes in the streams for nesting and resting, the brood ponds at the hatchery are barren except for three or four nail kegs. The swift streams and riffles, with their abundance of insect life, are also missing. The first year the adults are moved to hatchery ponds, spawning is very light or no eggs are taken at all. The second year, normal egg production is accomplished. Normal production may be defined as the production of the adults at the hatchery ponds after they have become acclimated to the new surroundings.

Adults are sexed in March or April and four to six pairs are stocked to each pond. They range in size from one and one-half to ten pounds. Occasionally some of the larger ones will reach twelve or fifteen pounds. The channel catfish spawn at the age of three years, but better results are gained at the fourth and fifth year.

Spawning takes place in kegs supplied for the purpose. Three or four kegs in each pond are staked down at a depth of about two feet under water to keep them from floating. The open end of the keg is placed toward open water, but they can be placed at any side of the pond. For convenience of collecting the spawn, the kegs are placed about six to ten feet apart.

If the water is clear the male and female may be observed striking and circling around the kegs. The male fish is the master of ceremonies, first preparing the nest by cleaning the keg of silt and dirt. After the debris is cleaned from the keg, a mucus secretion is liberated on the lower inner surface of the keg, making a very smooth, waxy appearing surface.

A female is selected by the male and lured into the keg. If the female refuses to go into the keg, she is many times treated roughly until she is persuaded into the next. Battles of males for favorite nesting kegs and favorite females also may cause injuries, sometimes resulting in death.

Spawning takes place in the day time from 8 a. m. to 6 p. m. and usally is completed in from one to three hours. The male and female may be in the kegs headed in the same direction, the vents close together and their bodies slightly tilted outwardly. If disturbed before spawning is complete, the fish will return immediately and complete the process.

After spawning is completed, the female leaves the nest, either willingly, or by force of the male fish. At no time has the male ever been observed to leave the nest unless disturbed. He remains over the eggs continually fanning them with the caudal and anal fins to clean them of sediment.

Cannibalism is sometimes practiced by the male fish, who devours the eggs and deserts the nest. For the past three years, seventeen percent of the spawn have been eaten by the males. It is not known why the male fish eats spawn but many eggs can be saved by collecting the spawn and hatching them in an incubator artificially.

It was believed that, for the most part, the spawning impulse was governed by the temperature of the water. After five years of recording water and air temperatures, it was found that cool weather slows down spawning for a few days. If it remains cool for sometime, as it was in 1941, the fish spawn, regardless of the continued coolness. If, after a cool snap, warm weather follows, spawning is abundant for the first two days and then goes back to the normal rate. In the past five years, the first spawn of the season was collected between May 29 and June 3. This observation indicates that illumination, as well as temperature, may play a part in the spawning impulse.

Females spawn but once a year and from all observation they have but one male. However, a male may take care of one or more females a season, but he never has more than one female at a time.

The size and number of eggs depends upon the size of the females. The first year, spawn is small and the eggs are smaller in size than those of females that have spawned for two or more seasons. The spawn from a female ranges from one-third of a pound up to six and one-half pounds. The six and one-half pound spawn is the largest ever to be collected at the Kansas Hatchery. The average spawn ranges from one to two and one-half pounds.

The eggs, in appearance, resemble small, gelatinous pearls, adhering together and looking much like tapioca. They are yellow in color. As they approach the hatching stage, the eggs turn from a yellow to a brownish-yellow moving mass. Eggs that are not fertile appear pale yellow to white in color and are slightly larger than fertilized eggs. The egg membrance of unfertilized eggs is not elastic and is more easily broken than fertile eggs, which makes them easy to remove without injuring the fertile eggs. Eggs number from 450 to 500 eggs per ounce or around 8,000 eggs per pound.

Nail kegs are visited every other day and the eggs are taken from the nest to an incubator to complete their hatching. The incubator is a wooden trough made from two by twelve boards twelve feet long. Five paddles are used with each incubator, the paddles being attached to rocker arms operated by a pitman which, in turn, is operated by a small water wheel.

The eggs are placed on screen racks in the incubators under the paddles. The purpose of the paddles is to replace the fanning process conducted by the male fish to remove sediment from the eggs.

The eggs hatch in from six to ten days, depending upon the temperature of the water. When the temperature ranges from sixty to sixty-five degree Fahrenheit, the eggs hatch in nine or ten days. As the temperature reaches seventy-seven degrees or higher the eggs hatch in five or six days. The eggs fail to develop at temperatures that remain below sixty degrees. Molds cause much loss to eggs that are kept at temperatures of ninety degrees or more. It is also necessary to candle out spoiled eggs from three to five times daily. If the spoiled eggs are not removed the eggs touching them may spoil. In some cases where the eggs were not removed, the entire spawn was destroyed.

Soon after the eggs hatch, the fry are siphoned from the incubator and placed in wooden troughs. Water is kept running through the trough to supply the fry with oxygen. The fry live on the egg yolk for the first four to six days, depending upon the temperature of the water. After the egg yolk is absorbed, the fry come to the surface of the water in search of food. They are fed from three to five days on dried buttermilk or egg meal. The fry are then moved out into ponds where they remain until fall. Sixty to one hundred thousand fry are placed in a pond. The fry are fed once a day on dried buttermilk and ground carp mixed in equal proportions. The past year carp was hard to get in sufficient quantities and meat scarp was used with dried buttermilk. This mixture proved very satisfactory. The fish raised the past year were the healthiest fingerlings that have been produced in the past five years, and ranged from four to six inches in length.

At the end of the first year, some fingerlings are stocked in new water throughout Kansas; others are held over and fed for the second season and stocked out in old waters. The second-year channel catfish ranges from seven to fourteen inches in length and is capable of competing against other varieties of fish found in lakes and streams. The yearlings, when stocked in old waters, are largely wasted and merely furnish food for other species of fish already in the waters. About ninety-five percent of the two-year-old channel catfish survive, but only ten percent of the first year channels stocked in old waters have been found to survive.

Crayfish are the main diet for the adult channel catfish. The surplus of crayfish taken from the hatchery ponds at fishing time are collected and placed in the ponds that contain the adult catfish.

Animals that prey upon the young catfish are varied. A stray bass or so in a catfish pond may consume a number of them, and in some cases forty or fifty bass may devour the catfish population in a pond by fall.

The water snake, belonging to the genus Natrix, catch a great number of fish annually at the hatchery. Water snakes have been observed catching a fourteen inch catfish. Many snakes have been killed that have contained from nine to as high as twenty-one of the six-inch catfish in their stomachs. As many as 161 water snakes have been killed in one day around the hatchery ponds.

Bitterns, herons, mergansers, and pied-billed grebes do some damage to fish populations, but are not abundant enough to be of much importance. Birds are easily frightened away and are an easy target if they become too destructive.

Turtles are abundant and do some damage to fish production. They do not catch many fish, but are a menace in that they eat food that is intended for the channel cats.

Fingerling catfish are free from most diseases if handled scientifically. The two-year catfish are exceptionally free from disease; the greatest losses come from predators. A protozoan disease, called ichthyophthirus, is about the only malady of importance

that attacks the first year catfish. This disease is caused by a skin-inhabiting parasite commonly found on warm water pond fish. The parasites are easily seen in the skin of infected fish, appearing as small white bumps, and vary in size from microscopic forms to that of a large pin head. The most effective treatment is to change the feeding ground by raising or lowering the water level. These protozoa must have fish life present in order to survive and without fish life will live but a few hours. By changing the feeding grounds the protozoa soon die and many fish escape without taking the disease. The disease usually occurs in the late summer or early fall. If one does not detect the disease until most of the fish are infected, the entire stock in a pond may be lost. It is good practice to raise and lower water levels and shift the feeding grounds to prevent the disease from ever breaking out.

The young channel catfish are nervous in nature and dart away quickly at any unusual sound. It has been noticed that the movement of trucks in feeding invariably causes a disturbance and many times the fish do not come in and feed until the truck has moved on. An accompanying car, with the one used daily, usually disturbs them and they feed but little, or, in some instances, do not feed until the cars have gone. A stranger riding with the employees in the truck that is used daily also disturbs the fish from feeding.—Leo Brown, *Kansas State Fish Hatchery, Pratt, Kan.*

Chukar Partridge

During the past year the Commission continued its experiments with the chukar partridge. These experiments have not, however, advanced to that stage where we are enabled to definitely assure you of success. The reports that have reached the commission are, however, encouraging. Many farmers, to whom a planting of these birds was allotted, reported that an increase in their numbers had been noted. Other farmers reported that the birds had not been seen on their property since the day of their release.

Some of the sportsmen have complained that the bird is not instinctively wild enough to be considered suitable as a game bird. The same statement can be made about quail, or any other specie of wildlife that is undisturbed for long periods of time. Sportsmen on the whole, however, welcome the chukar partridge as an addition to our game birds. After the war, these birds will be produced in larger numbers at the Meade county pheasant-chukar farm and released in larger groups in suitable areas. When the Commission has had an opportunity to study the results of such plantings then and then only can it be definitely determined whether this bird can be successfully introduced into Kansas game fields.

TO KEEP THE RECORD STRAIGHT "OLE DAVE" JOTS IT DOWN

"I have asked this question before, and I am asking it again, 'Why do not the legislatures lift the ban on fish; why have to pay a license at all? '

"I see where a bill was introduced to raise the status of the lowly frog to fish. It sounds unnecessary. Rather than ban more things that the poor people can eat and will put forth an effort to get, the legislature could take the price off the head of the fish. Let the poor people have the food that God has so bountifully given them." Alfred A. Goodbar, Topeka, Kan.

In the foregoing statement Mr. Goodbar urges the repeal of that section of the law which provides for the issuance of fishing license, believing that the exaction of such a fee deprives the poor of one of their inalienable rights. We do not doubt the honesty and sincerity of Mr. Goodbar in his contentions and for that reason we attempt an equally honest explanation of the commission and its laws.

At the outset we want it to be generally known that there are no great differences, at least insofar as fish are concerned, between He who created the fish and they, the commission who are engaged in perpetuating them. He and they certainly want everyone to have enough fish to eat, especially the poor.

The laws governing the taking of fish are very liberal. They do not work a hardship on any class or group of people. As the laws now stand all anglers are legally permitted to take nearly four thousand game fish yearly to say nothing of the fish that are not classed as game fish. The license fee for such rights and opportunities certainly cannot be considered excessive or unjust. The funds collected by the commission from license holders are reused not only in the propogation of more fish and in the improvement of streams but in an never-ending fight against stream pollution as well. If streams had not been dispoiled by many generations of use, there would of course be no need for giving nature a helping hand. But conditions, unfortunately, are not now as they were on the fifth day.

It is to repair and offset the damage man has done that fishing laws and regulations have been divised and enacted and not in an attempt to deprive the poor of any of their opportunities to enjoy the fruits of the Creation or to nullify the Divine Will.

A reader asks if game birds are susceptible to the disease of tularemia and, if so, is the disease transmittable to the sportsmen who handle and eat them. To both questions, a definite "yes." Although tularemia is commonly considered to be essentially a

rabbit disease it often occurs in other animals and game birds. Pheasants, however, are thought to be highly resistant to the disease. Birds infected with tularemia are not these birds that take readily to wing when flushed, but the ones that are not inclined to move about. The hunters who pot shoot game birds, particularly quail, are more likely to come into possession of sick birds than is the sportsman who shoots them only when in flight.

As a precautionary measure and to lessen the danger of infection, sportsmen are urged to wear rubber gloves when handling and cleaning any game birds or animals suspected of having the disease.

The animal pictured on the front cover of this issue of KANSAS FISH AND GAME is that of the ground hog. The pictured animal is the household pet of the Ralph Montel family of Lawrence, Kan. Fred Kahn, a fellow townsman, sent the picture to us with the suggestion that it be used "on the February 'ground hog' issue, as few people have seen such a picture."

We find ourselves in agreement with Mr. Kahn's further assertion that the ground hog has been unjustly condemned because of its fake weather prognostication and of the name that has been given to it. In other states where the animal is known by its proper name Marmot or Woodchuck it is considered a game animal and is intensively hunted because of its food value.

The animal has neither named itself nor does it make any claims as being a weather predictor. Superstition has it that on February 2d of each year the Woodchuck leaves his den to predict the weather for the following six weeks. This is indeed a very interesting animal and will be discussed more fully in the subsequent issue of this magazine.

Cheyenne Bottoms

Of the many splendid accomplishments of the Commission during the past year, none were more widely applauded by the public than the Commission's successful efforts in launching the Cheyenne Bottoms project. For many years the development of this part of Kansas into a migratory waterfowl refuge has been urged, not only by Kansas sportsmen but by many of the national organizations as well.

Cheyenne Bottoms is the name given to a platter-like depression in Barton county, northeast of Great Bend and southeast of Hoisington, Kan. It is fully ten miles long and from three to five miles wide, containing some twenty thousand acres. The commission, under the present plans, contemplates the acquisition of 18,768 acres within the Bottoms and for the subsequent empounding of a lake covering 11,000 acres. The water required for such an inland sea, as is planned, will be diverted from near by Walnut creek and the Arkansas river by means of dams and diversion ditches. During the late nineties water was diverted from the Arkansas river into Cheyenne Bottoms in that manner, but as the early plan for the development of Cheyenne Bottoms was strictly one of promotion it was abandoned after a short time due to the lack of financial support. Many of the ditches that were then used are still in evidence and will undoubtedly be utilized in the present and more worthy plan of developing Cheyenne Bottoms.

Quail

It gives us a great deal of satisfaction to report that this useful and popular game bird has been reëstablished in Kansas.

Every county, without exception, has reported a heavy increase in its quail population. The percent of increase, however, was greater in the eastern part of the state. In the western part of Kansas, notably in those counties where dust storms were frequent a few years ago, the increase in quail was satisfactory, but not heavy enough to warrant a general open season on them. In order to give them every encouragement possible the Commission, by regulation, closed many of the counties of that area to quail hunting during the 1941-'42 seasons. This very satisfying condition of quail growth is due largely to the efficiency of our game farms and to the alertness and good judgment of our game protectors. The game farms met the bird quotas designated by the Commission for each of the laying seasons. The game protectors planted the birds only in fields deemed to be conducive to the birds' welfare. Birds were not placed in those areas where such conditions were not favorable.

This practice resulted in some criticism from those who had been refused birds for their farms and game fields, but the Commission reasoned that if conditions were not normally favorable birds should not be wastefully placed in such areas despite whatever protests might follow.

Very Nice of You

The commission has received many complimentary letters from the readers of KANSAS FISH AND GAME. Extracts from a few follow:

"Will you please send me KANSAS FISH AND GAME? I have borrowed copies from my friends. It is an interesting publication and I am very much interested in it."—JOHN MERIVIN, Lawrence, Kan.

"Would appreciate receiving monthly KANSAS FISH AND GAME magazine. The copies that I have seen have been very instructive to the sportsman."—DR. A. URBAN, Salina, Kan.

"I would like for you to send me KANSAS FISH AND GAME publication each month. I like it very much and wish to be placed on your regular mailing list."—HAROLD POWELL, Wichita, Kan.

"Your district game protector, Mr. Benander, gave me one of your recent issues of KANSAS FISH AND GAME. Every bit of it is interesting and I read it all. Your little magazine is a revelation and I appreciate Mr. Benander's kindness in giving it to me very much."—O. H. NEELEY, Topeka, Kan.

"Dr. Hendrickson, of Iowa State College, showed me a very interesting copy of your monthly magazine, KANSAS FISH AND GAME. Would appreciate it very much if the State Conservation Commission of Iowa could be placed on your mailing list."—JAMES R. HARLAN, *Supt. of Public Relations.*

"This library is interested in procuring a file of your periodical, KANSAS FISH AND GAME. We would consider it a favor if you would send us a file of the back numbers."—KENDALL C. ELKINS, *Document Supervisor, Harvard College Library.*

"I would like to get on your mailing list for your magazine, KANSAS FISH AND GAME. I have seen several copies of it and I think it is a great publication."—TOM W. FLORY, Ottawa, Kan.

"Just received a recent issue of KANSAS FISH AND GAME you have been mailing me every month. I am always anxious for its arrival as we learn a lot about fish and game matters. I think you are doing a good job of it."—C. H. ELNIFF, Jamestown, Kan.

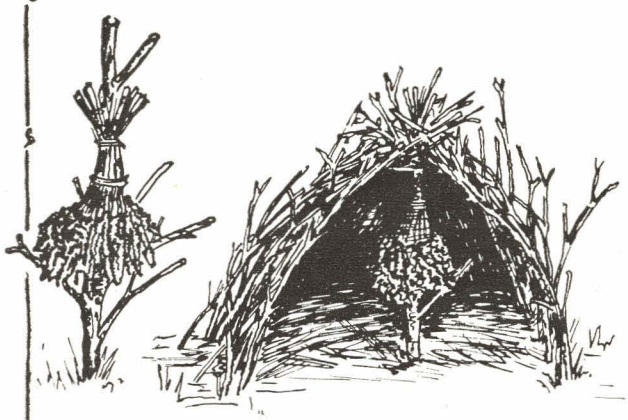
"I just saw at the *Tribune* office a copy of the bulletin put out by the Fish and Game Department monthly. I would certainly like to have four copies of each publication of this bulletin to place in the libraries and on the reading tables of our four school buildings."—AMOS W. GLAD, *Supt. Schools,* Pratt, Kan.

"The other day I chanced to see a copy of KANSAS FISH AND GAME and feel that this would be a good magazine to place before my students. Each year I train, in the field of Human Geography and Economic Geography, some three to four hundred students who will, in most instances, go the following year into the rural schools of Kansas."—LEONARD W. THOMPSON, *Head Dept. of Economics and Business Administration, Kansas State College.*

"I have heard very many complimentary things about your monthly publication, KANSAS FISH AND GAME, so naturally I am interested in subscribing to it. I wish you would send it to me."—W. D. ANGLE, Lincoln, Neb.

ARRESTS FOR DECEMBER AND JANUARY

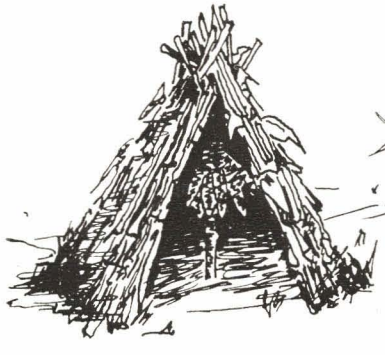
DEFENDANT	CHARGE	PROTECTOR	DISPOSITION
Charles Francis Dunham	Illegal possession of pelts	Rickel	Convicted
George Belinger	Hunting without license	Benander and Toburen	Convicted
Walter George	Hunting without license	Benander and Toburen	Convicted
Orville Howard, Jr.	Illegal possession of furs	Toburen	Convicted
Robert Isaman	Illegal trapping	Toburen	Convicted
Harry A. Hopson	Hunting without license	Rickel	Convicted
Robert E. Frederick	Possession and discharging of firearms in state park	Rickel	Convicted
Sherman Rerick	Illegal hunting	Jones	Convicted
H. I. Blackburn	Illegal hunting	Jones	Convicted
G. E. Dannels	Illegal hunting	Jones	Convicted
Charles N. Garner	Illegal trapping	Golden	Convicted
Earl Oldweiler	Illegal trapping	Anderson	Convicted
Ed. Nepereny	Selling fur without license	Jones	Convicted
John L. Jones	Hunting quail in closed season	Rickel	Convicted
Jim T. Smith	Hunting quail in closed season	Rickel	Convicted
W. J. Wendell	Selling fur without license	Byrne and Jones	Convicted
John Shaffer	Selling fur without license	Jones, Byrne	Convicted
Bill Randa	Selling fur without license	Jones, Byrne	Convicted
Wm. P. Dillon	Trapping without license	Byrne, Jones	Convicted
Marvin Wagner	Selling fur without license	Jones	Convicted
Wm. J. Hanoch	Out of season fur dealing	Carlson	Convicted
Orval Klaus	Out of season fur dealing	Carlson	Convicted
Nelson S. Anzelmo	Hunting quail without license or stamp in closed season	Rickel	Convicted
Hershel Riddle	Hunting without license	Rickel	Convicted



TEPEE-TYPE BRUSH SHELTER & FEEDER

LEAN-TO SHELTER & FEEDER

FOOD SUSPENDED FROM A WIRE FENCE

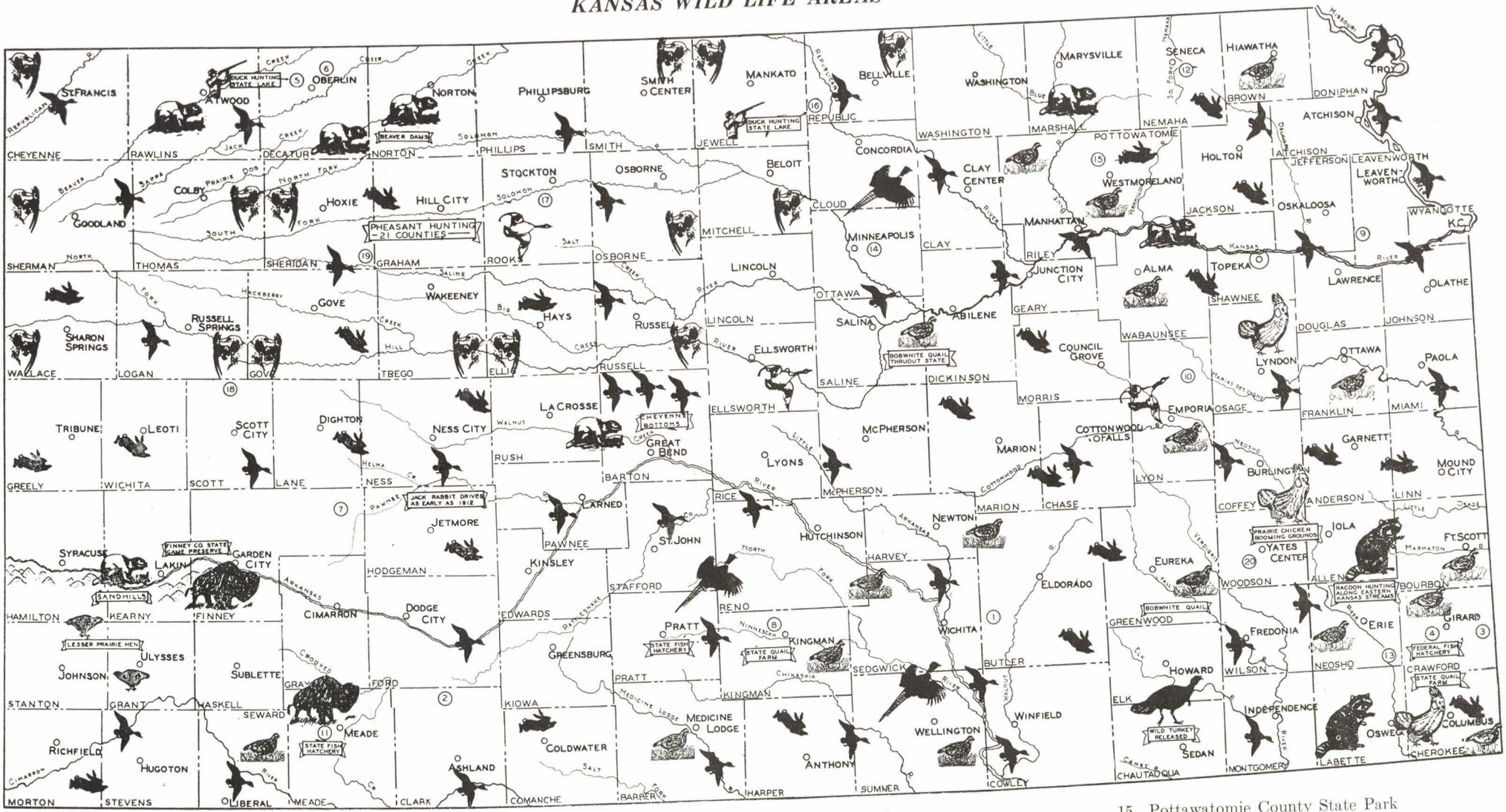


TEPEE-TYPE SHOCK SHELTER & FEEDER

LEAN-TO SHELTER ON FALLEN TREE

—Courtesy Missouri Department of Agriculture.

KANSAS WILD LIFE AREAS



1. Butler County State Park
2. Clark County State Park
3. Crawford County State Park No. 1
4. Crawford County State Park No. 2
5. Decatur County State Park No. 1
6. Decatur County State Park No. 2
7. Finney County State Park
8. Kingman County State Park
9. Leavenworth County State Park
10. Lyon County State Park
11. Meade County State Park
12. Nemaha County State Park
13. Neosho County State Park
14. Ottawa County State Park
15. Pottawatomie County State Park
16. Republic County State Park
17. Rooks County State Park
18. Scott County State Park
19. Sheridan County State Park
20. Woodson County State Park