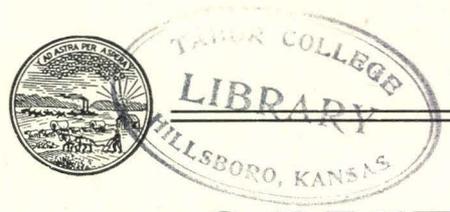


KANSAS FISH AND GAME



VOL. XI

JANUARY, 1954

No. 3



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KANSAS FISH AND GAME

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Kansas Parks and Lakes Attract Thousands

Surprisingly for a prairie state, Kansas provides its citizens and visitors with many opportunities to enjoy water sports and outdoor recreation.

By the end of the current fiscal year, the state's recreational system will be increased from 22 to 32 state lakes and parks, the well-known Cheyenne Bottoms wildlife refuge, two game preserves and two attractive strip-pit areas in eastern Kansas. Another big wildlife refuge on the Marais des Cygnes river is in the process of acquisition.

Many of the state parks astonish tourists with their wealth of natural beauty and scenic spots. The lakes have been located in areas of rugged terrain, natural valleys or other interesting sites that provide a welcome change from the surrounding plains country.

During the past summer tourist season, an estimated 450,000 persons visited ten of the state parks. Butler County State Park alone drew approximately 109,350 visitors from May through September. Largest crowds at the Butler park are from Sedgwick county, but the park is located so close to Highway 54 (1½ miles north) that it attracts many tourists. Members of the Wichita Sailing Club keep their craft at the Butler

County State Park. During the summer sailboat races are held.

One of the most popular recreational spots in western Kansas is Scott County State Park, which had an estimated 50,000 visitors last year.

Many young people visit the Scott County State Park, drawn by the Boy Scout summer camp, Santa Fe Trail, and the Methodist youth camp which borders the lake on the east.

Attractions for visitors include a small buffalo herd and the often rewarding search for arrowheads and other Indian relics. The El Quartejejo pueblo was built on the park site centuries ago and, according to history, the ruins were occupied early in the Eighteenth century by the French traders who founded the first white settlement in Kansas.

Cars from 44 states stopped at the Nemaha County State Park near Seneca last summer. The swimming pool is one of the big drawing cards at this park. Records show there were more than 200 swimmers on opening day and 250 on the Fourth of July. The park had a big increase in tourists last year, but fewer fishermen because of the low level of the lake.



High-rising bluffs characterize Clark County State Lake, located ten miles south and one mile west of Kingsdown.



Boating is one of the principal recreational activities at Butler County State Lake, one of the most heavily patronized of the state lakes. Sailboat races are held each summer under the sponsorship of the Wichita Sailing Club.



A boy and his dog pause momentarily in a boat on the shore of the Leavenworth County State Lake. The lake of 175 acres is one of the most appealing to fishermen in the state park system.

The new shelter house at Neosho County State Park was in almost constant use last summer. In addition, the park has a picnic area with small individual stoves. The construction of two fishing docks on the lake has attracted many fishermen and the number of night fishermen has increased since electric lights were installed on the dam. Most frequent visitors to the park are residents of Parsons and employees of the Kansas Ordnance Plant, located seven miles from the park. Vacationers en route to other points also found the park a convenient camping place. During the summer and fall drought, the lake proved invaluable to local farmers as a source of water for livestock.

The number of tourist campers was estimated to have been doubled last season at the Ottawa County State Park near Minneapolis. All the states were represented at the park by campers or visitors. Many of them were astounded by the large trees in a heavily wooded section of the park. They couldn't believe such a spot was located in Kansas. Attendance for the season was estimated at 72,000.

Summer tourists at Woodson County State Park

came from almost every state and Canada. Of the 535 camping permits issued through September, more than half were for out-of-state visitors.

Clark County State Lake officials rated the last season as not-so-high in attendance, although they estimate 15,000 visited the area. They blamed the lower attendance on unfavorable weather conditions.

Visitors to the Farlington lake, Crawford County State Park No. 2, were estimated at 40,000. The park is particularly popular as a fishing and camping area. At least 25,000 persons visited the Crawford County State Park No. 1, located near Pittsburg.

An estimated 1,600 to 2,000 out-of-state campers visited Decatur County State Park near Oberlin during the summer season. Total attendance was set at 18,000.

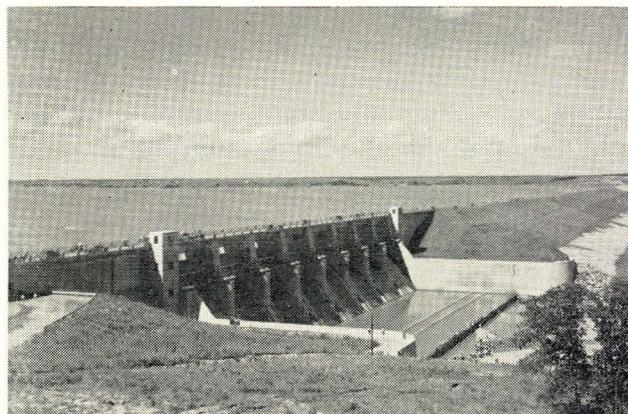
The Maxwell Game Refuge in McPherson county attracted approximately 4,000 visitors last summer. The refuge is "home" to 48 buffalo, including 18 calves, eight elk and many deer. Beavers have built ten dams on the refuge and many people inquire about them.

Other areas have been developed principally as fishing lake facilities, but they, too, provide recreation for a large number of picnickers and campers, as well as fishermen, from both Kansas and other states.

Additional state lake and park facilities are located in Decatur, Finney, Kearny, Kingman, Lyon, Leavenworth, Meade, Miami, Pottawatomie, Republic, Rooks and Sheridan counties. Game preserves are in Finney and McPherson counties and game bird farms, always open to visitors, are operated at Pittsburg and Calista (quail) and at Meade County State Park (pheasant).



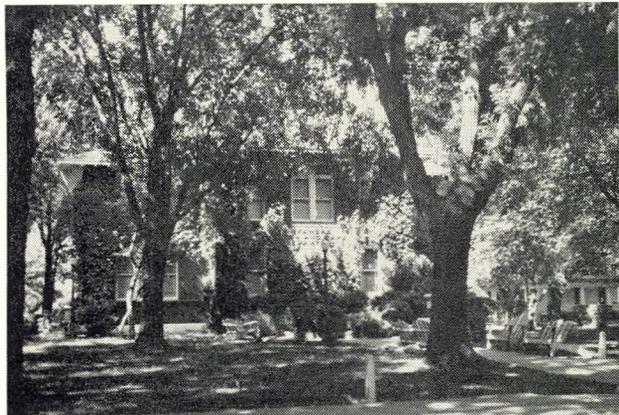
This rugged shore line is part of the Woodson County State Park. The 179-acre lake recently was restocked completely with several varieties of fish.



This large dam is located at the east end of Fall River reservoir, large federal impoundment that annually attracts many visitors.



Swans and peaceful waters are to be found at the Meade County State Park. Pheasant and fish hatcheries are open to visitors at this park.



This shaded building houses headquarters offices of the Forestry, Fish and Game Commission at Pratt. Thousands of visitors annually come to the grounds to visit the museum and aquarium on the ground floor, the fish hatchery operations and the small zoo at the back of the main building.

Thousands annually inspect the state fish hatchery, museum and aquarium at Pratt, also site of the state fish and game commission headquarters.

Besides its own facilities, the state co-operates in the operation of three large federal impoundments, Cedar Bluff, Kanopolis and Fall River reservoirs. Two others are under construction. Kirwin reservoir is scheduled for completion in December, 1955. The foundation for the dam of the Webster reservoir was finished last month.

Preliminary work has been started on the Salt Marsh Wildlife refuge in Stafford and Rice counties. The project is being executed by the U. S. Fish and



Swirling water and waves add to the fun of boating at Kanopolis, federal impoundment and one of the largest bodies of water in the state.



Scott County State Lake reflects the last rays of the sun. The park of 1,200 acres contains relics of Indian history.

Wildlife Service, but fishing and hunting on it will be managed by the State Forestry, Fish and Game Commission.

Used in conjunction with the huge, 18,000-acre Cheyenne Bottoms refuge, the state park system fills a big recreational need for the people of Kansas. It also gives tourists a reason to stop and stay a while during their travel through the state.



A young angler finds the fishing fascinating at Neosho County State Lake (Lake McKinley).

Report on Progress of Fish Management Studies on Strip-mine Lakes

CHARLES BURNER, Fisheries Biologist, Kansas Forestry, Fish and Game Commission*

(EDITOR'S NOTE: Since the foregoing article was written, a co-operative program in the strip-mine lake area referred to in the article has been instituted between the owners of the coal mines in the area and the Kansas Forestry, Fish and Game Commission.

Although all details of the plan have not been worked out, the general agreement is for the coal companies to make lakes of the area available to the state and for the Fish and Game Commission in turn to manage and improve the fishing for public use. The Commission will begin work on the program as soon as organization is complete. The author of this article, Charles Burner, has been named to get the plan in working order. The mine owners are to provide him with information on the lakes they will make available for improvement. The Commission is ready to start the work immediately.

Mr. Burner, commission fish biologist, who has devoted the past three years to fisheries research in the strip-mine lake area, in this report tells of progress made in his fish management studies.)

In recent years the increasing number of fishermen with the resulting increase in fishing pressure has made it necessary to explore all possibilities for developing fish populations to meet this increased demand on ponds, lakes and streams of the state. The Kansas Forestry, Fish and Game Commission is studying conditions in strip-mine lakes of southeastern Kansas, in order that we may arrive at some course for improving the fishing success in these waters so as to help meet this increased fishing pressure, and to provide more good fishing waters for the public.

The U. S. Forestry Service, in a report dated 1946, reports that water covers an estimated eight percent of the surface of strip-mined land, and at this time 25,000 acres of land had been strip-mined in Kansas. These figures would indicate that there are 2,000 acres of water in this area and more are being created each year. I was told by a representative of one coal company, that his company strips 320 acres per year, about one-half section of land. There are now four major coal mining companies operating in southeast Kansas and a number of smaller companies.

In 1949 the Fish and Game Department made a preliminary study of the strip-pits of southeast Kansas, which are located mainly in Cherokee and Crawford counties with lesser amounts in Bourbon, Linn and Osage counties. Before this time particular attention had been paid to stocking these strip-pit waters with fish from the hatchery. In the summer

of 1950 studies were intensified in co-operation with the Kansas State Teachers' College at Pittsburg and have been progressing since.

Results of the 1949 survey indicated that about twenty percent of the strip-mine lakes have water that has a low pH (degree of alkalinity or acidity) and is therefore too acid for good fish habitat. Many more lakes are so small or inaccessible that they cannot be considered of much value as potential fishing water. That still leaves quite a large number of strip-mine lakes varying from one-half acre to more than thirty acres in area which can support a good fish population and which are of interest to the angler.

Many of these lakes have been stocked and are providing good fishing, while many other lakes, especially the older ones, are not affording satisfactory fishing. The older strip-lakes seem to go through much the same cycle as other lakes in the state; that is, the bluegill gradually gets the upper hand and becomes stunted, crowding out the bass. A few years after the pits are stocked, they seem to show their best fishing, then gradually dwindle off, and a decline in catches is observed. These numerous small sunfish are larger than the size usually eaten by bass and smaller than is desirable to the angler. They compete with the bass for what food is available and we have evidence which indicates that they eat the eggs of the game fish while spawning and that they eat the fry soon after they have left the spawning bed.

Our investigations relative to strip-mine lake fishing are for the purpose of working out the best management techniques in an effort to improve fishing conditions in these pits where angling success is below the capabilities of the water.

The work conducted in 1949 was in the nature of a reconnaissance, or general field survey, for the purpose of determining the extent of water areas and the possibilities of fisheries improvement. General physical, chemical and biological studies were started on a representative cross section of the strip-mine lakes of the region and were continued the following summers. These studies were intensified during the summer of 1951 when a biologist was assigned to devote full time to this work. The Biology Department of Kansas State Teachers' College at Pittsburg, the Fish and Wildlife Service hatchery at Farlington, and some major coal mining companies are co-operating with the Commission in this work. Investigations were

* The author wishes to express gratitude for the use of the facilities of the Kansas State Teachers' College, Pittsburg, Kansas.

started for the purpose of determining the kind and abundance of fish food, and the growth, conditions, and abundance of fish in the lakes.

Of course, one cannot safely generalize in speaking of conditions in the water, since exceptions are usually easy to find. We hope you will bear in mind that exceptions are apt to occur in any generalization when dealing with ponds and lakes where the conditions which affect fish life are very unlikely to be duplicated in any two bodies of water. However, some of the information which has been made available as a result of investigations made up to the present time, which is typical of general conditions in strip-pit waters, is presented below.

The Size of Strip-mine Lakes

Variations in the size of strip-pits are mentioned earlier. Observations on farm fish ponds in Kansas show that impoundments of one-third of an acre or less are too small to support a fish population satisfactory for good angling and therefore are generally unsatisfactory for management. We find that this is also true of strip-pit waters and therefore are confining our work to strip-pits larger than one-half acre in area.

The pH Determination of Water

Since some of the strip-pits in this area are too acid to support fish life, this is one of the first tests we make on strip-pit waters. Locally these acid waters are called "alkali" waters. These tests have been made on a large number of lakes distributed throughout the strip-mine area. We have found wide variations of pH readings in this group of strip-pits, which range from a high reading of pH 9.4 which is rather highly alkaline down to a low reading of 2.8, which is quite strongly acid. Conditions are quite unfavorable for fish life at a pH of 4.5 or lower, and fish do not do well unless the pH is considerably higher. However, the pH of a majority of pits range between 7 and 8.4, which is near the optimum range best suited for fish and fish food organisms.

Oxygen and Carbonate Alkalinity

Chemical analyses are conducted for making determinations of the dissolved oxygen, carbonate and bicarbonate alkalinity and carbon dioxide present in the water. In most instances, these have been well within the range best suited to warm-water fishes.

Productivity of Strip-mine Lakes

In general the fertility of these waters is below the average for other impoundments such as farm ponds and lakes throughout the state. It can be readily seen that ponds and lakes in other regions will constantly

receive enrichment from surface drainage, because the water which fills them, drains from fertile pasture and crop land, much of which is fertilized. On the other hand strip-mine lakes which receive most of their water from seepage and the remainder from sparsely vegetated spoilbanks receive a very limited amount of organic fertility.

The water in strip-pits is characteristically quite transparent. Visibility in excess of twelve feet in depth has been observed in a number of instances. This factor alone is enough to almost completely eliminate chances of spawning success by crappie, channel catfish and bullheads when game fish are present. It also appears to lessen spawning success of the bass. We are engaged in a co-operative research project on fertilizing in some strip-pits owned by the Hume Sinclair Coal Company. Three-inch fingerling bass stocked in June had grown to 9½ inches by September in one fertilized pit. We are making



One hundred percent co-operation with the landowner is the goal of the Fin and Feathers club of Shawnee-Mission High School, Merriam, a club of 90 boys interested in hunting and fishing.

This fall they initiated a project to supply farmers in the eastern part of the state with as many "No Hunting" or "No Hunting Without Permission" signs as they desired. They gave out several hundred signs.

The young sportsmen believe that only through full co-operation with the fellows who raise and feed the game birds can they expect good hunting in the future.

The club annually carries out several projects inspired by their conservation studies with the help of their club sponsor, Felix Shular.

—Photo by John Dauner.

regular checks on these pits in order to follow closely the progress of this experiment so that we may learn something of the feasibility of attempts to improve the fertility of the water. The object of fertilizing is to increase fish food organisms which will be reflected in improved growth of the fish. One of the outward signs of successful fertilizing is a reduced transparency of the water, usually where the transparency is reduced to twenty-four inches visibility or less.

Fish Population Studies

During the summer and fall of 1951-1952 and in the spring of 1953 intensive studies were made concerning the fish populations of a group of pits. In 1951, as one phase of the program, four pits were selected because they appeared to be typical of those in the area and because the fishing success seemed to be on the decline. Chemical, physical and biological studies were made on the pits during the year, then in the late summer the fish populations were removed. Fish were collected, measured, counted, and weighed and all results tabulated. Scale samples were collected from representative individuals to be used in age and growth rate studies. All of these pits were later restocked.

Last fall and this spring additional pits were similarly treated. Partial removal of fish is also being tried by chemically treating a part of a strip-pit so as to reduce the fish population. Later we stock with game fish. We are also trying marginal treatment of only the shallower waters during the summer while the larger fish are in the deeper waters thereby removing the sunfish and relatively few bass. After partial removal the waters are restocked with bass, channel catfish and crappie. It is too early yet to say much about the relative success of different types of stocking which have been tried. However, very encouraging results are being obtained on some strip-pits which have been restocked. Strip-mine waters which were studied during the summer of 1953 and which had been restocked approximately fifteen months showed that three-inch fingerling bass had grown to ten or more inches. Channel catfish stocked at the same time had grown to a length of twelve inches during the same period.

Following is a brief summary of some of the fish recovered from a few strip-pits which had not been systematically stocked or managed.

In a two-acre pit in Crawford county, which contained shad, we got a yield of 224 pounds of fish per acre. This included the following:

199 bass weighing 20 pounds
 1,984 sunfish weighing 85 pounds
 800 shad weighing 119 pounds
 (There were 7 legal sized bass [10 inches or more]
 weighing 15 pounds, per acre)

In a 1½ acre pit in Crawford county we found a yield of 1,366 pounds per acre. This included the following:

237 bass weighing 23 pounds
 40 crappies weighing 7 pounds
 7,407 sunfish weighing 105 pounds

In this pit there was a ratio of thirty-one sunfish for each bass. This pit was badly overpopulated with sunfish. In these pits there were approximately thirteen legal-sized bass weighing 20½ pounds per acre based on fish recovered. This seems to be about the average number of large bass for the older strip-pits.

Last fall we found a low yield in a 6-acre pit in Cherokee county. In this pit we found 5 legal-sized bass per acre. We found a total per acre yield of fifteen pounds of bass, all other fish recovered (including 5 pounds of bullheads) weighed thirty-six pounds, giving a total yield of fifty-one pounds of fish per acre for this pit.

We are working up information on the age and growth of these fish, and although we have results on some of the earlier work, we are not yet ready to make comparisons.

Since the primary goal of the program is to produce better fishing conditions for the satisfaction of the fishing public, analyses of fish populations of the study lakes and the development of a suitable management program are demanding the most attention. We are now analyzing fish growth and the results of different combinations which have been tried during the past few years and we are conducting development work on many more lakes each year. This development work consists of a variety of management techniques depending on information gathered on the particular pit regarding the problems confronted. Plans are then worked out in order to best correct this situation and to improve fishing conditions. Our management work includes the following:

(1) Total removal and subsequent restocking of fish where investigations indicate this is the best way to improve fishing success.

(2) Partial eradication in a portion of a strip-pit and restocking with game fish so as to restore a balance of sunfish and bass.

(3) Marginal treatment of the shallow waters to reduce the numbers of overabundant pan fishes so that the more desirable game fishes will be given an opportunity to multiply and make better growth.

(4) Stocking new strip-pit waters as they fill soon after the mining operations are abandoned.

We are also keeping close watch on a few places where walleye pike and trout have been stocked as an experiment and we are anxious to use any information which we may find to prove practical. In one

strip-pit with an area of fifteen acres, walleye pike were stocked as fry in the spring of 1953. When the strip-pit was partially poisoned in the fall of 1953, none of these walleyes were recovered. More investigations will be made to determine the extent of survival of these walleye fry.

As these strip-pits are worked on they are restocked with fish from the hatchery, as needed. These methods and other management techniques, applied according to need, should afford good fishing for many years to come.

Because of the differences in many of the environmental characteristics in the strip-pits which differ markedly from those of other waters in the state including streams, ponds, and lakes, results of investigations conducted on these other types of waters cannot be applied directly in managing strip-pit waters until initial studies are made to show that such management techniques will produce the desired effects.

Although strip-pits occur in a number of other states, almost no fisheries studies have been carried out in the past. Kansas is probably the first state to launch intensive investigational studies of strip-mine lake conditions. There are now a few other states doing work on strip-pit research and development, and I feel we shall all profit as more information is made available.

It is our hope that those who are interested in improving fishing in the strip-pit areas will realize that much time and work go into such research projects and where new techniques and stocking ratios are tried it will be a few years before the fish have grown to such an extent as to make it possible to evaluate these management techniques. We hope that all interested persons will realize that results aren't forthcoming in a period of months, but that work must continue over a period of years in order that sound management techniques may be developed and in order that we may satisfactorily explore the possibilities of strip-mine lake fishing.

We are greatly encouraged with the over-all outlook of the fishing possibilities in southeast Kansas. We feel that these strip-mine lakes will not only meet the fishing pressure of local fishermen, but with proper management can serve to attract fishermen from a wide area.

A sure way to know you've got a blue catfish is to count the rays (rods supporting the fin membrane) in the anal fin, the single fin just forward of the tail on the bottom side of the fish. The blue has 30 to 35 anal fin rays compared to the channel's 24-29.—*Fisherman Magazine*.

Kansas Host for 1954 Great Plains Habitat Conference

The Fifth Annual Great Plains Habitat Conference will be held in Kansas sometime in September of 1954. Officials of the Kansas Forestry, Fish and Game Commission extended the invitation to meet here at a time and place to be announced later. Representatives from at least seven states (Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Colorado, and Wyoming), the U. S. Fish and Wildlife Conference, Bureau of Reclamation, Soil Conservation Service, commercial nurseries and horticultural experiment stations will be present for the meeting.

The Great Plains Habitat Conference is probably one of the most specialized conferences held anywhere in the field of wildlife management. It started because Colorado technicians wanted the opportunity to discuss habitat development problems and techniques with the technicians of neighboring states. The conferences are strictly informal with no formal papers presented. All discussions are handled on the panel basis.

The fourth annual conference of the group was held at Bismarck, North Dakota, last September. The Kansas fish and game commission was represented at the conference by five of its game management technicians. They were Richard Eggen, Leo Klameth, Max Stone, Tom Gatie and Dave Coleman.

Discussions at the Bismarck meeting included such topics as: How much good habitat development is doing; what intensities of development are justified; what are the best methods for carrying on these programs; what is the relative urgencies, by wildlife species, for doing habitat work?

Cover Picture

This month's front cover picture is a typical scene at the Neosho County State Park. This park was the first site to be selected and developed in the state lake and park program. The park is heavily patronized and is located just a few miles northeast of Parsons.

—A K. I. D. C. "Kansas Photo."

Conservation is a way of life—a way of improving our standards and fortunes and the destinies of those who will follow.—*Tennessee Conservationist*.

Every earthworm is both male and female and is capable of laying eggs to produce its own kind. It cannot, however, fertilize itself.

Experiments Aim at More Prairie Chickens for Kansas

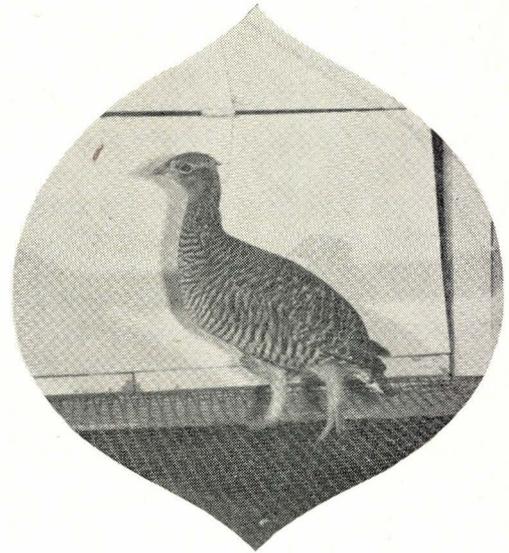
If long-range efforts of the Kansas Forestry, Fish and Game Commission work as anticipated, the state will be able to propagate prairie chickens in captivity. This research study, now in progress, along with a project of spreading out the native stock, may mean eventual repopulation of this species in areas long since deserted by them.

Raising prairie chickens in captivity presents all sorts of problems not encountered with any other game bird. For example the young birds do not appear to take to mash or small grains as quail and pheasants do.

At the Calista game farm where the commission is conducting a research project on the best means of artificial rearing of the lesser prairie chicken, any animate or moving food was found to have more appeal. So Game Biologist Jim Coats devised a feed that apparently looks delicious to them.

He ordered small grub-like worms put out by a feed company. He had the worms dipped in egg yolk, then rolled in a grain mash, somewhat like the preparation of breaded pork chops.

Coats is not suggesting the "breaded" worm type of feeding as the best, but he has found it satisfactory in his work so far. The project is at the end of its



first year, and, although the start is a good one, any theories developed must be checked and double-checked.

The scope of the investigation, still in its infancy, so far has extended from the trapping of wild birds in late winter, holding them in breeding pens through the summer, to obtaining eggs from the breeders and hatching the young.

Next year's phase of the project now can continue with several prairie chickens raised in captivity.

Many other problems face Biologist Coats, Byron Walker, manager of the Calista game farm, and their helpers. Incubation requirements appear to be different for lesser prairie chickens and must be studied, as must the proper techniques of mating them.

Along with this project, the habits and entire life of the prairie chicken are under close scrutiny. One department game biologist, Marvin Schwilling, has been assigned full time to the study of the status of the lesser prairie chicken in western Kansas. He will work out of Garden City, examining the seasonal movements, the feeding, nesting and loafing characteristics of the bird. He also will investigate its history and former habitat.

His work will include trapping the birds for transplanting in areas where there are few prairie chickens. This is believed to be one of the best methods of enlarging the stock. The transplanted chickens will be studied to determine how they adapt themselves, whether they move from area to area, and other factors.

The need for all this research has come with the gradual thinning out of the bird from the Plains area due to encroaching cultivation of the soil, the tendency toward overgrazing of remaining pasture land and the damage of the dust bowl days.



Jim Coats, game biologist for the Kansas Forestry, Fish and Game Commission, who is in charge of the prairie chicken experiments.

Wildlife Requires Good Habitat

Hunters afield during the quail and pheasant seasons this fall generally found fewer birds than in former years.

As usual, many disgruntled hunters blamed the State Fish and Game Commission. Some persons were of the opinion the commission was wrong in allowing a ten-day open season on pheasants; others thought there should have been a closed season on both pheasants and quail, or there were those who enjoyed good hunting success and made no complaints.

Let's look at the facts. A better guess as to why hunters found fewer birds this past hunting season would be the drought of the last two years which reduced cover for birds and thereby reduced the game bird populations. There was less standing feed and less vegetation to hold the birds and nesting success was below normal.

Cover also has been decreased by "clean" farming methods that eliminate growths of weeds in fence rows and odd corners.

Lack of suitable cover ranks highest on the list of harmful conditions for game birds, higher than hunting which many observers have considered the top mortality factor. The effect of shooting on game bird populations usually is overemphasized, game biologists now agree. The results vary with different species, but, by and large, the number of birds killed by hunters represents a small percentage, probably not exceeding ten percent, of the total loss.

The encroachment of civilization and the ever-changing patterns of land use, without question, have been most important in reducing game bird populations. As the grassland was plowed, the numbers of prairie chickens rapidly decreased. Elimination of brush vegetation in waste corners on farmlands ruined many a home for the bobwhite.



Burning of cover along fences, ditch banks, and in sloughs and waste areas during the fall and spring also are among the top enemies of farm-game birds. Destruction of this cover eliminates the last remaining place that is safe for hiding, nesting and roosting. With this vegetation gone, pheasants must find refuge in the agricultural crops where they are constantly disturbed, and often are subjected to the hazards of the whirring mower sickle, the combine, or the one-way plow.

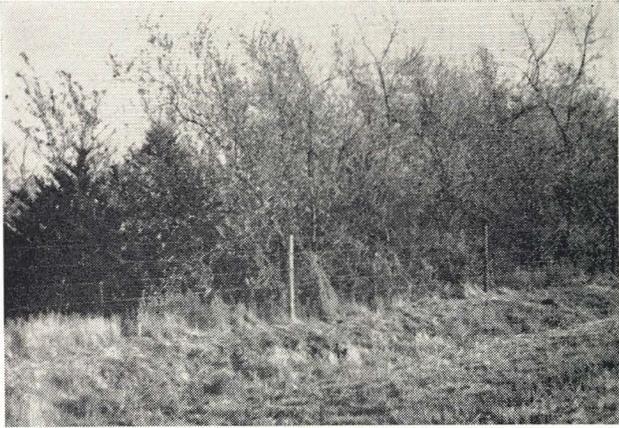
Elimination of fences and farming of the last corner on the place are even more detrimental than burning cover. The recent tendency has been to plant wheat and other crops to the very roadside, then put up a temporary, single-strand electric fence for grazing cattle, thus eliminating fence-row growths of weeds. Many fields are big and provide no islands of cover. With these sanctuaries for birds permanently removed, and with all crops harvested, quail and pheasants find themselves homeless and soon disappear.

While "clean" farming has been built up as the agricultural ideal, it handicaps the development of the state's wildlife. If the farmer wants to increase game birds on his property, there are several things he can do. A few hedgerows, fence rows and timber claims do wonders for game birds. Their presence is beneficial in reducing air movement and subsequent evaporation, in preventing erosion, and in providing shade. Strips of grain left along the edge of fields, where sunflowers often grow, would be a boon to game birds and a very small loss to the farmer.

Farmers who let weeds grow up in fence rows, leave odd corners uncultivated and plant shelter belts are rewarded by having a covey of quail or a family of pheasants move in. Many landowners take great pride in the wildlife inhabitants on their farms.

The cover program of the Kansas Fish and Game Commission attempts, as far as possible, to supply planned tree and shrub plantings in areas where they are needed most. Thousands of seedlings are dis-





tributed by cover restoration personnel for approved locations each year. The trees are grown at the commission nursery at Calista.

But the commission's program alone is not adequate for the restoration and preservation of cover over the state. The co-operation of hunters and landowners also is needed. The farmer is in a key position in cover work because he can employ farming methods advantageous to wildlife. And the sportsman, if he wants birds to hunt and the area to hunt them, must work with the farmer in saving and extending suitable habitat in a way that will work to the economic advantage, or at least convenience, of the farmer.

Desirable cover practices are shown in the pictures on these pages. Weeds growing in a fence row at the edge of a wheat field, pictured in Column 1, provide excellent cover for pheasants and other birds. A multiflora rose "living fence," the illustration in Column 2, also is valuable cover. Above is a shelter belt and below brush and dead branches piled in shelter belt rows for winter cover for wildlife.

Indian weather forecast: "See many two crow fly, good weather. See many one crow fly alone, storm come pretty damn soon!"



Izaak Walton League Will Sponsor Youth Award

A new program of recognition of youth achievement in natural resource conservation has been announced by the Izaak Walton League of America. The first national awards, to a boy and girl of 'teen age, are expected to be made in Chicago in conjunction with the League's 32d national convention on March 11, 12, and 13, 1954.

The awards will consist of trophies and vacation trips to national parks and conservation "crisis spots."

Elimination contests are to be held in the states, and the state winners—a boy and a girl each—are to attend a youth rally at the League convention, at which time the national winners are to be chosen.

The annual event will be open to any boy and girl between thirteen and nineteen years of age, but the League expects to work closely with existing youth organizations that provide conservation instruction and incentive in their present programs. An advisory committee is being set up to help in the final determination of minimum standards the boys and girls will be expected to meet in order to be considered in the judging, which is to be done at the state level by a Governor's Committee, and at the national level by a special committee selected by the League.

The plan is described as not intended to duplicate any existing program, but to supplement, and to provide additional incentive to the young people of the United States to participate in natural resources conservation, restoration and management activities. Gary Cooper, Warner Bros. star, whose films have exemplified clean, healthful outdoor living, has been asked to serve as nominal head of the League's "Young Outdoor Americans" achievement recognition program.

The Kansas Forestry, Fish and Game Commission and conservation departments of the other forty-seven states are co-operating with the League.

Governor Edward F. Arn has named Dave Leahy, director of the Kansas Fish and Game Commission; Tom Van De Car, of Stafford, one of the state's outstanding sports columnists; and Floyd Amsden, noted sportsman and conservationist of Wichita, as members of the Kansas Governor's Committee to work on the project in this state.

Research on the eyes in walleyes gives a clue as to why these fish move more at night than in daytime. Unlike the eyes of most other animals, their eyes are poorly adapted for bright light but are very sensitive to weak light.—*The Fisherman's Digest*.

Cheyenne Bottoms Refuge Fulfills Expectations

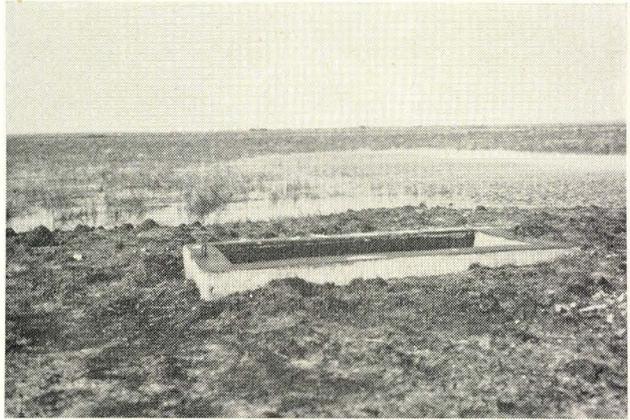
Now that the 1953 migratory waterfowl season is over, it can be said that in the first season's operation of the Cheyenne Bottoms, the vast migratory waterfowl refuge in Barton county fulfilled its primary purpose—that of attracting thousands of ducks and geese to Kansas. Vast numbers of these migrants will remain in the state. The refuge area clearly demonstrated that where you have water, resting and nesting areas, you will find waterfowl.

The refuge also fulfilled its expectations as a hunting area. While drouth conditions limited the water available to hunt over, hunters generally liked the blinds provided for them and the manner in which they were operated. Not all hunters enjoyed good shooting. The experienced hunter, properly garbed, who stayed in his blind and used decoys, generally had good hunting success. Unfortunately, the earlier part of the sixty-day season was "bluebird" weather and not altogether right for good duck hunting. On those cold, blustery days when the ducks were moving about, there was good shooting and many limit kills were taken.

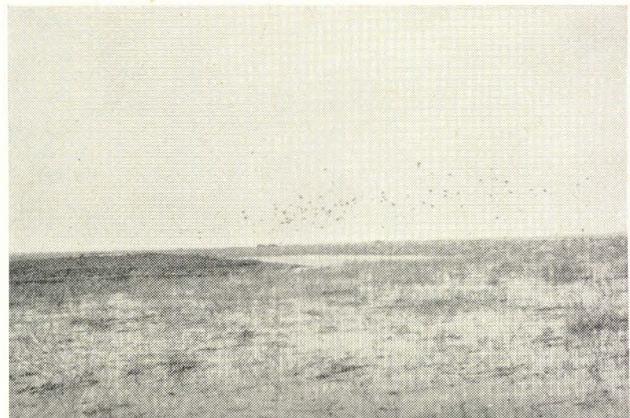
Hunting is but a minor phase of the Cheyenne Bottoms project. It is a multiple-purpose project and the greatest public use of the area is expected to be made during the spring and summer months, when it will be used for fishing, boating and other recreational sports.

As more and more of waterfowl's natural breeding areas in Canada and northern states are destroyed, as more and more wintering grounds in the South are reclaimed, the need for restoring such areas in the Midwest is necessary, if we are to maintain waterfowl populations. The nearly complete Cheyenne Bottoms, the progressing Marais des Cygnes waterfowl area, and the proposed Great Salt Marsh waterfowl

refuge are all designed to meet that need. Kansas is indeed fortunate that such projects are a part of the State Fish and Game Commission's program and are included in future plans of the U. S. Fish and Wildlife Service.



This is one of the 59 blinds, constructed for two hunters, open for the duck season last fall. The blinds are on small mounds situated at the safe distance of 300 yards apart. A block of nine blinds is reached from a single footbridge. Shooting is permitted on the outside perimeter of the blind area 300 yards beyond the last blind.



A flock of ducks flies over a Cheyenne Bottoms blind, the dark mound at the left of the picture.



Mrs. Sally Murdock of Wichita draws the metal disk imprinted with the number of her blind from a bucket held by Warren Moore, Cheyenne Bottoms manager.



Successful hunters Russell Walker, left, and Arthur Gates of St. John, display their opening day bag limits of ducks. Gates also got a goose.

White Bass a "Kidnapped" Fish

White bass, just now becoming numerous in Kansas lakes, is a pretty special kind of fish. It rated a personal introduction into the Sunflower state.

Like hard winter wheat, which, according to legend, was brought to Kansas by Russian immigrants who sorted the wheat, seed by seed, before leaving the Old World, white bass were caught one by one for release in Kansas waters.

Most new kinds of fish and game are contracted for on a commercial or scientific supply basis after it is determined they will make a satisfactory adaptation to the state.

But not the white bass.

The species, one of the gamest of the bass family, was practically kidnapped. White bass are the special "babies" of the State Forestry, Fish and Game Commission fisheries men.

Research had shown that the white bass should make an excellent addition to the game fish list in Kansas and procedure to import some of them from hatcheries of other states was duly started. But some hitch always developed before the importation could be effected.

The fisheries men grew impatient. When Kansas again missed a white bass distribution from the hatchery of a neighboring state, they drew an alternate plan of action.

They bought Oklahoma fishing licenses and went on a week end fishing trip to Grand Lake in northeastern Oklahoma. Using minnows for bait on a rod and line, the three men caught more than 300 white bass. (There is no size or creel limit on them in Oklahoma.) They were transferred carefully from hook to fish truck. Then they were taken quickly to large Kansas impoundments that would be suitable homes for them.

About half were placed in Cedar Bluff reservoir and half in Kanopolis. Another fishing trip produced the same results. The fish were carried to the same large Kansas lakes and to Fall River reservoir with a higher survival rate.

That was three years ago. In summer, 1952, the second year of white bass residence in Kansas, they began to show up in fish tests of Cedar Bluff and Kanopolis reservoirs. They were, of course, returned to the lake waters.

Last summer Cedar Bluff and Kanopolis fishermen caught sizable white bass. Once their adjustment is made to new surroundings, they should reproduce rapidly. For this reason, fisheries men do not believe creel or size limits on them will be necessary.

White bass particularly like to feed on small shad and should be beneficial to lakes for this reason, as well as for the good sport and good food they provide.

A few of the Oklahoma fish were placed in ponds of the commission's hatchery in Pratt. For two years the original stock did not reproduce but this fall when the ponds were seined for the annual distribution of fish, thousands upon thousands of fingerling white bass were found. They will be placed in the large impoundments of water which have proved to be the best environment for them.

All the evidence seems to show that Mr. White Bass approves of his unorthodox introduction to the state and has the hardy qualities that will make him a good citizen.

Opossums are rather slow-moving stupid animals which seek safety by their retiring nocturnal habits and nonresistance to enemies. It is because of this last trait that the familiar "playing possum" originated.



The six-month-old white bass shown here were drawn from a tank at the Pratt fish hatchery by Seth Way, hatcheries superintendent. White bass weigh about three pounds when full grown.

Outdoor Notes

By JOE AUSTELL SMALL

Why Animals' Eyes Shine

Animals' eyes shine at night for the same reason that roadside reflector buttons shine. Behind the retinas of these night explorers is what amounts to a cluster of mirrors. The faint moonlight, or starlight, in which they must see is reflected by these mirrors and thereby multiplied.

Built for the Job

Antelopes are amazingly well adapted for life on the open prairies. They have large trachea for easy breathing, big leg bones for strength and speed, and large eyes for excellent vision. Their body hair is hollow and acts as good insulation against the prairie winds.

Fast Flying

When wild birds migrate, they often do some fast traveling. Records show that one mallard flew at least 500 miles in two days. The bird was banded at the Lacreek National Wildlife Refuge, near Martin, South Dakota, on October 17, 1938, and was recovered two days later near Pawhuska, Oklahoma. Another mallard banded at the Lacreek Refuge on October 18 was shot on October 20 near Carmen, Oklahoma, a distance of 510 miles.

Age of a Deer

You can determine the approximate age of a buck deer by measuring his antlers at the base. If they are under 19.9 millimeters in diameter, the deer is less than a year and a half old. If they are over 19.9, he is one and one-half to two years old. The following table is pretty dad-burned accurate:

20.0 mm. to 25.9 mm.	—20% will still be under two years.
	80% will be two to three years old.
26.0 mm. to 27.9 mm.	—67% will be 2-3 years. 33% will be 3-4 years old.
28.0 mm. to 33.9 mm.	—3-4 years old.
34.0 mm. to 37.9 mm.	—50%, 4-5 years old. 50%, 5-6 years.
38.0 mm. and up.	—6 years or over.

Lose a Hook—Save a Life

It is very difficult to release a fish so skillfully that it will not die later. Once the tender, slimy outer covering is injured, the fish dies. He may look frisky as a colt when you let him go—but an unbelievably high percentage of them die later.

Cut your snell or leader and release the fish with hook in him. You only lose a hook and two or three inches of line. The hook will gradually disintegrate inside the fish with no ill effects.

A sure way to take fish is to place a cricket, grasshopper or other insect on a hook and float it down the river on a chip or shingle. Don't use a sinker. When the little raft comes to a rock or snag, jerk the baited hook off into the water. This is a deadly method in late summer for walleyes, catfish, and bass.

—*Iowa Conservationist.*



Raccoons are becoming so numerous in Kansas that three of them showed up inside the Leavenworth city limits—in the yard of the Arthur M. Johnson home. John H. Johnston, III, staff photographer for the Leavenworth Times, also showed up with his camera for the coons' visit and snapped this picture as they came down the tree and scampered away. The trio had been ready to leave earlier, but Johnson's dogs had a different idea. They had picked up the scent and treed the coons. Shortly after the photographer arrived, Johnson penned his dogs and about 10 minutes later the coons started to ease their way down the tree.

—*Photo Courtesy John Johnston, III.*

Catfishing at Its Best in Big and Little Blue Rivers

Fishermen say catfishing was at its best this fall in the Big and Little Blue rivers in the vicinity of Blue Rapids and Marysville in Marshall county. And, they brought home fish to prove it.

Raymond Griffee, of Blue Rapids, fishing in the Big Blue below Schroyer, caught eight yellow cats one evening that totaled 268 pounds. Their weights were 49, 41, 39, 28, 18, 32, 31, and 30 pounds. He was fishing with a trotline, using chubs and suckers for bait.

Harold Smith, another of Blue Rapids' dyed-in-the-wool fishermen, came in one day with eight yellow cats ranging in size from about two pounds to 31 pounds. Total weight of the one-day catch was 108 pounds.

Others reported having good luck fishing the two rivers included: Pete Jenkins, Bill Isaman, Roy Croft, Monty Brooks and Basil McKee, all of whom caught cats weighing twenty pounds or more.

Basil McKee swears he hooked one on September 29, that must have weighed a 100 pounds or more. The fish took the bait and kept right on going, breaking a double strand of sixty-pound test nylon staging.

According to Paul H. Ham, deputy state game protector at Blue Rapids, they have the best fishing in the state up there and from all reports it must be so.

Liberty Wildlife Group Organized

Sportsmen of the Liberty community in Ottawa county got together at a meeting in October and organized the Liberty Wildlife Conservation Association. V. I. Crofts was elected president, Ted Barnhart vice-president, Gardner Hayden secretary, John Ward treasurer, and Philip Pritchard sergeant at arms. The organization started off with thirty-one charter members.

New Officers for El Dorado Wildlife Association

The Walnut Valley Wildlife Association at El Dorado held its annual election of officers in October, according to Fritz Nicodemus, secretary of the club for the past three years. New officers elected included: Ray Callaway, president; Fred Barton, vice-president; Hoyt Green, secretary - treasurer. New members on the board of directors included Spence Huffman and E. R. Callaway. W. C. Haxby was re-elected to the board.

The El Dorado club is one of the more active clubs in the state.

It's All In a Name

If you buy the Mrs. a fur coat called any of the following, it is made from rabbit skins: French seal, French beaver, Beaverette, Chapchilla, Chinchillette, Coney, Ermeline, Erminette, Marlotine, Moline, Near Seal, Polar Seal, Lapin, Sealine, Squirrellette, Squirreline.

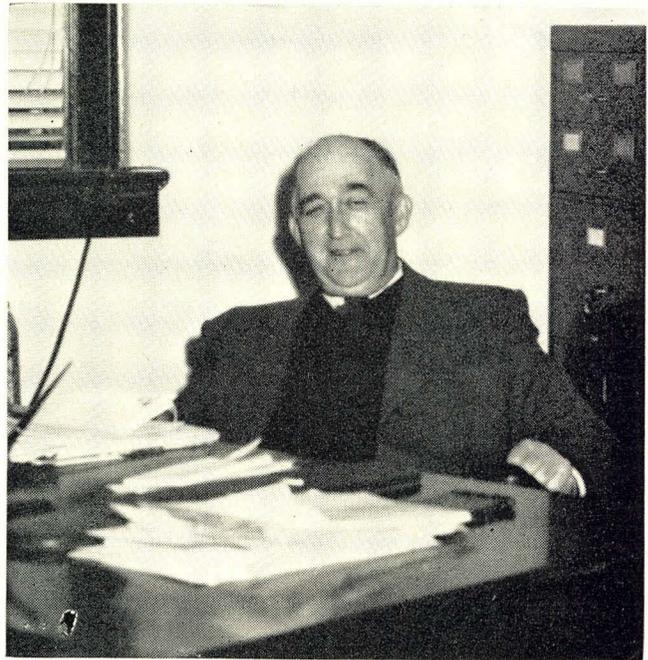
Wonder what they call beaver, seal, and squirrel skins?

Short Snorts

Each common toad is said to be worth at least \$7.50 annually to farmers because of the harmful insects it eats.

The kangaroo rat is neither a kangaroo nor a rat, but is a near relative of the pocket mouse which shares his desert haunts.

Three common beliefs are that bats snarl themselves in women's hair; falling cats always land on their feet, and elephants are afraid of mice. All are untrue.



Dave Leahy, director of the Forestry, Fish and Game commission, rounded out a quarter of a century of service with the department in December. Starting as accountant and chief clerk in 1928, Leahy was appointed director February 1, 1944. The fish and game department over the ten years of his tenure as director has been greatly expanded on a sound and progressive basis. Under his guidance, many notable projects have been undertaken and completed toward the development of the state's fish and game resources for the greater enjoyment of residents and visitors. These projects have included the Cheyenne Bottoms waterfowl refuge and recreational area, the Marais des Cygnes waterfowl area, the construction of new fishing lakes, the improvement of state parks and other commission properties, the addition of technical personnel to the staff, and many others.

Director Leahy is held in high regard by other state and federal conservation officials. He is a past president of the Association of Midwest Fish and Game Commissioners, was twice president of the Central Flyway Council and has held numerous important committee assignments in the International Association of Fish and Game Commissioners.

The Spiritual Side of Conservation

EARL L. SHAUB

Volumes have been written from the scientific angle on the necessity of conserving our natural resources. We should also see these needs from a spiritual viewpoint. In fact, we have a great moral obligation to wisely use, conserve and restore the natural resources of the earth, without which we could not survive. We also owe it to future generations to see to it that they enjoy the same abundance that we have.

This is a sacred obligation that is stressed in the Scriptures as well as in the experiences of the human race. Dominion over the earth with its plants and animals, fish and fowl, is a big responsibility that should be met wholeheartedly and with solemnity and dignity. This dominion is stressed in the psalms:

"Thou madest him (man) to have dominion over the works of Thy hands, Thou hast put all things under his feet. All sheep and oxen, yea, and the beasts of the field, the fowl of the air, and the fish of the sea, and whatsoever passeth through the paths of the seas."

The first of our natural resources, of course, is the soil. Since most of the elements in our bodies came from the soil, good health and even life itself depends on good soil. In fact, every material thing we have—our food, our clothes, the material in our houses, the commodities in our commerce—came to us through the soil which must not be abused.

Nations in the past decayed as soon as their soil was depleted. So our standard of living and even civilization depends on the degree to which we protect and replenish the fertility of the earth. It is a sacred heritage. In Genesis, we read:

"And the Lord took the man and put him in the Garden of Eden to dress it and keep it."

Next in importance is the forest. We must protect and replace our trees as rapidly as we use them for it is our duty as trustees of the earth to maintain the productivity of the forest. Exploitation of the woods is a crime against nature and society. The importance of wood in our daily lives and in our economic world is seen in the fact that forest industries are second only to agriculture. A tremendous number of useful products, in addition to lumber, come from trees. Where the woods have been slashed we find desolation and poverty.

It is in the forest that we get a clear sense of unity. Anyone who meditates for five minutes in the grove will feel his kinship with all. Then he must realize that one source of life equally animates the tree, the bird, the deer and man.

Our obligation to protect our trees through scientific forestry practices is mentioned in Genesis:

"And God said, 'Behold I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in which is the fruit of the tree yielding seed, to you and it shall be for meat.'"

Trees and other forms of vegetation also provide the habitat and food for the birds and animals of which we are the guardians. They are an active part of the plan of creation and we could not exist without them. It is a high privilege to be the custodians of these creatures and we must meet that responsibility by maintaining the balance of nature or suffer the consequences.

Our obligation to care for the animals and birds is brought out in the Psalms:

"For every beast of the forest is mine, and the cattle upon a thousand hills. I know all the fowls of the mountains, and the wild beasts of the field are mine."

We must conceive the earth as the Lord's. The Scriptures word it this way:

"The earth is the Lord's and the fullness thereof, the world, and they that dwell therein."

When we take that to heart we will realize that we are treading on holy ground and that we are the stewards who have the privilege of caring for the earth. Then we shall know that conservation is a vital part of spiritual life and an expression of practical love for those who will come after us.

We hear a lot about erosion and exploitation on this plundered planet, but the picture is not as gloomy as it appears. Nature always responds to man's efforts and she will assist in scores of ways if mankind goes to work on the problem. With nature's aid and man's god-given intelligence and energy, man can restore and keep his fields and forests perpetually productive.

We should meet our obligation with devotion and joy. Our task should be as pleasant as working in a garden where the rewards are manyfold with full larders, good health and prosperity.

This work is a means of self-expression for we are a part of the living landscape. The man who participates in it is co-operating with God in a creative act.

It is a high privilege to preside at the mystery of the growth of the plants, the birds and the animals. In this we see the unity of all creation, with man at the apex.

Marvelous, isn't it—to live in a world like this?—*The Tennessee Conservationist*.

When the vagrant cowbird tries to take advantage of the little yellow warbler by laying an egg in its nest, the warbler generally refuses to co-operate. It simply roofs over the whole nest, eggs and all, builds a second nest on top of the first one and starts all over again.

KNOW YOUR FRIEND--THE GAME PROTECTOR



These introductory sketches of Game Protectors Jones and Gillespie are the first in a series on the 33 game protectors of the Kansas Forestry, Fish and Game Commission. Believing that their work is vitally important to the cause of conservation, the Commission is proud to introduce them around the state in Kansas Fish and Game.

A veteran of 14½ years with the commission, Arthur C. (for Clarence) Jones works out of his own home town, Downs.

When he joined the game protector force June 1, 1939, Jones had thirteen counties in his district. But that was during the war when manpower was limited. He now has Smith, Osborne, Rooks, Russell and Barton counties to look after. He assisted Warren Moore with the operation of the Cheyenne Bottoms blind shooting area in Barton county last fall.

Jones was an engine dispatcher on the Missouri Pacific railroad at Downs before becoming a game protector.

His hobbies are, naturally, hunting and fishing.

There are no parasites of fish which can't be rendered harmless to man by thorough cooking.—*Iowa Conservationist*.



Clement Gillespie, 33, entered the Forestry, Fish and Game Commission's game protector service seven years ago, not long after he got out of military service. He had served from 1940 to 1945 in the medical service and was in Alaska thirty-two months as a supply sergeant.

He is game protector for the south half of Cowley county, Chautauqua and Elk counties. He lives in Arkansas City. His family includes his wife, Myrl, and two daughters, Cheryl Ann 7, and Sheila Kay, 5.

His hobby, aside from fishing and hunting, is raising Weimaraner dogs. He was one of the first in Kansas to take over the breed after it was brought from Germany where it had been the exclusive property of the aristocracy.

There is something basic and elemental, and even primitive, in man's response to fishing—something that comes nearer taking him entirely out of the world of tension in which he lives and bringing him into communion with the soothing forces of nature. This affinity definitely exists, otherwise fishing would not be what it is today—the most popular of all participation sports in the nation.—*Hart Stilwell*.

State Quail Farms Set New Production Record

Kansas' bobwhite population got its biggest boost yet in the 1953 production of the state's two quail hatcheries. A new top record of 34,020 birds for release was set by the Calista and Pittsburg hatcheries.

Favorable conditions helped bring about an unusually productive year. Large-scale hatchery operation demands constant care and attention on the part of the operators, but record production requires the co-operation of the weather.

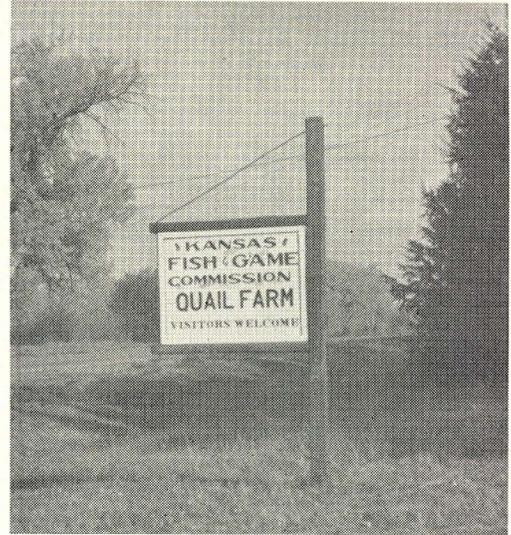
The men in charge of this branch of the State Forestry, Fish and Game Commission work are Charles Troxel, superintendent at Pittsburg for the past nineteen years, and Byron Walker, Calista superintendent who has completed six years in his present job.

The production story, from egg to quail released by the game warden, is an interesting one. At Calista the eggs are obtained from 300 breeders held over from the previous season. The eggs are gathered only once a week so that the birds will not be unduly disturbed, except in extremely hot weather when they are taken twice a week.

They are set weekly, immediately after gathering, in incubator trays labeled with the date. After eighteen days in the incubator, they are moved to a hatcher for the final five days. A thousand chicks break through the shell in each hatch and Walker plans fifteen hatches each summer at Calista.

Temperature is particularly important in handling the eggs. A constant temperature of 99½ degrees must be maintained in the incubators and the hatchers. This temperature is easy to obtain in a forced air hatcher, but regulation is necessary in a dead air hatcher. Usually the latter hatcher must be set at 101 to 103 degrees, depending on the distance of the thermometer from the egg tray.

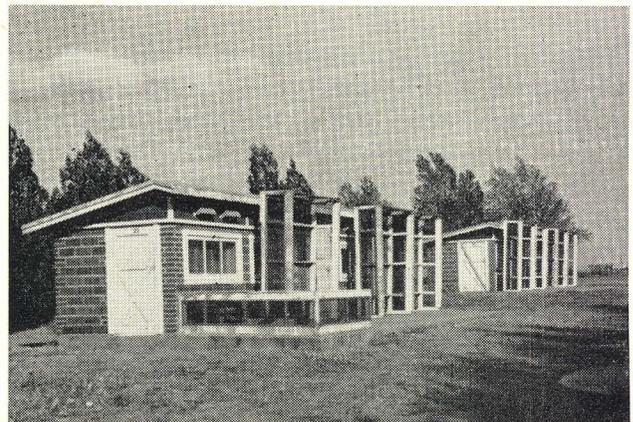
The baby quails next are transferred from the hatchers to the brooder houses. Electrically heated, the brooder houses provide 95-degree heat for the newly hatched chicks, but the temperature is lowered five degrees each week for the next four weeks. The



Calista hatchery has 32 brooder house rooms with a capacity of 200 birds for each room.

When the young quails are a month old they are put in holding pens for several weeks and then are liberated. Distribution is effected through the game wardens. In central Kansas, officials plan the release of 200 birds per county. The number is higher in eastern Kansas where more cover is available. Birds are supplied to western Kansas counties as they are requested by the game wardens who consider the amount of cover each year.

Brood stock for the next year is saved from the first and second hatches of the season. Laying records are kept on each hen. If the hen does not lay sixty eggs in a season or if defects show up in the chicks, the hen is culled. Quail hens normally lay 80 to 95 eggs in a season.



Brooder houses with controlled heat are the next temporary lodging of the baby quails after they leave the hatchery. The outside pen is down and ready for the young chicks on the brooder house at left. They are placed upright on the others. Inside each is a heating unit. The temperature is lowered five degrees a week for four weeks.



Byron Walker, superintendent of the State Forestry, Fish and Game Commission quail farm at Calista, demonstrates the trays of an incubator at the hatchery.

Eighteen tons of feed are used annually at Calista. The amount of feed seems to run about the same, regardless of production, Walker says, since a bad year usually results from the loss of birds after they are partially raised. A complete game bird feed, which requires no supplement, is used at the hatchery.

About fifteen acres of ground are needed for a quail hatchery of Calista's size. The Calista hatchery is fortunately situated in the Kingman County State Park and its size can be expanded if more room is necessary for moving holding pens or for other purposes.

Five workers help in the operation of the Calista hatchery in the summer. Two are retained over the winter months.

Cost of producing the birds at the state's quail farms runs about a dollar a bird. In some years it may be higher, while in others slightly below this figure.



After the fourth week, the quail chicks are taken from the brooder houses and are placed in these holding pens. They are ready for release several weeks later.

How Fast Is a Fish?

"It was formerly thought that the fins, particularly the caudal fin, and the tail were the sole and primary means of locomotion, but experiments have shown that a fish without tail or fins is far from helpless. The chief method of progression is through the rippling undulations of the fish's body, aided by the streams of water from the gills." David Gunston, in the July issue of *The Fisherman*, discusses the various speeds of fish and how these speeds were determined in "How Fast Is a Fish?"

The speeds of fish are determined ". . . by stop watch, 'fish-o-meter' attached to a rod to register the speed at which the line is run out, another similar device in which tank fish are harnessed with a fine silk cord which unwinds over a large pulley actuating a sensitive relay once every revolution; by taking a film of swimming fish and working out their speed by comparison of the varying positions on each picture frame of the film; by timing a swimming fish from the known speed of a ship which passes in a recorded time; even by calculating the speed of the current in a river and then working out the minimum speed a fish must achieve to make headway against it."

From these devices and methods, scientists and experts have estimated that the fastest fish is the swordfish with speeds from 60 to 70 miles per hour. The wahoo can travel 37 m. p. h.; the blue shark, 24; the salmon, between 18 and 25; the trout, 23; the pike, 20; the bass, 12; and even the slow-moving carp can make 7.6 m. p. h. All of these speeds are far in excess of the human's swimming record of only 4.01 m. p. h.!



A Giant Canada Goose was bagged on opening day of the 1953 season by Ira M. Rucker, Jr., Wichita sportsman, near Colwich, Kan. The 12-pound goose is held here by Rucker's two sons, Dick, 6, left, and Stephen, 8. The big honker had a wingspread of 67 inches.

ARRESTS—AUGUST, 1953

<i>Name and address</i>	<i>Offense</i>	<i>Date of offense</i>	<i>Fine</i>
Norman Bissing; Hays	No fishing license	7-30-53	\$10.00
James Blue; Kansas City, Mo.	No fishing license	8- 1-53	5.00
Benjamin Burgard; Topeka	No fishing license	8- 8-53	10.00
W. G. Evans; Barnard	No fishing license	8-22-53	5.00
Chester Fairbanks; Ransom	No fishing license	8- 8-53	5.00
Paul Fairbanks; Ransom	No fishing license	8- 8-53	5.00
Marcus R. French; Ft. Leonard Wood, Mo.	No fishing license	8-18-53	5.00
Wesley Ikenberry; Quinter	No fishing license	8-12-53	10.00
Hardy Ingram; Dodge City	No fishing license	8-15-53	5.00
Kendall Jameson; Phoenix, Ariz.	No fishing license	8-12-53	10.00
Joanne Law; Wichita	No fishing license	8-16-53	5.00
Elmer G. Long; Topeka	No fishing license	7-25-53	5.00
Harry Raeka; Topeka	No fishing license	7-25-53	5.00
Elmo Nevius; Kansas City	No fishing license	8-15-53	5.00
Loren Dale Price; Wichita	No fishing license	8-22-53	10.00
Patricia Stotler; Wichita	No fishing license	8-16-53	5.00
Ben Lee Sisson; Nevada, Mo.	No fishing license; operate too many trotlines	8-22-53	15.00
J. D. Slater; Sunflower	No fishing license; operate too many trotlines	8-22-53	15.00
Howard Decker; Ozawkie	Operate trotline in state lake	7-22-53	7.50
Jack Nielsen; Dodge City	Operate trotline in state lake	8- 2-53	5.00
Dean Redding; Lawrence	Operate trotline in state lake	7-22-53	7.50
Allen Sylvester; Lawrence	Operate trotline in state lake	7-22-53	7.50
Charles E. Tarry; Dodge City	Operate trotline in state lake	8- 2-53	5.00
J. N. Owens; Kansas City	Operate too many poles and trotlines	8-25-53	10.00
L. E. Scarbrough; Topeka	Operate too many poles and trotlines	8-28-53	10.00
Robert Conley; Leavenworth	Handfishing	7-15-53	10.00
Lawson Johnson; Leavenworth	Handfishing	7-15-53	10.00
John P. Bovetz; Leavenworth (also 60 days in jail)	Handfishing; threatening an officer; contempt of court	7-15-53	45.00
J. C. Brewer; Wichita	Possession of short fish	8-16-53	10.00
Ralph W. Brundige; Edna	Possession of short fish	8-30-53	15.00
Paul M. Crow; Cherryvale	Possession of short fish	8-30-53	20.00
Ed Friedel; Clafin	Possession of short fish	8- 2-53	15.00
R. R. Lawson; Sunflower	Possession of short fish	8-25-53	20.00
Francis McConkey; Sunflower	Possession of short fish	8-25-53	20.00
Vincent Meyers; Kansas City	Possession of short fish	8-23-53	10.00
Lee Edwards; Arkansas City	Operating trotline within 150 yards of dam	8-15-53	10.00
Joe Jenkins; Udall	Operating trotline within 150 yards of dam	8-15-53	10.00
Dick Walker; Arkansas City	Operating trotline within 150 yards of dam	8-15-53	10.00
Leland L. Trautman; Meade	No hunting license	8-10-53	5.00
Phillip Wells; Topeka	No hunting license	8-30-53	10.00
Bruce Watson; Wichita	No hunting license; killing dove in closed season	8- 7-53	20.00
M. D. Emberton; Kansas City	Possess game bird in closed season	8-17-53	50.00
R. C. Underkoffler; Winfield	No game breeders permit	8-16-53	25.00
Harry Balthrop; Kansas City	Trespassing	8- 1-53	5.00
J. E. Bush; Kansas City	Trespassing	8- 1-53	5.00
Jim Roland; Kansas City	Trespassing	8- 1-53	5.00

ARRESTS—SEPTEMBER, 1953

<i>Name and address</i>	<i>Offense</i>	<i>Date of offense</i>	<i>Fine</i>
Bill Burges; Chapman	No hunting license	9-11-53	\$5.00
Harold Cooper; Chanute	No hunting license	9- 6-53	10.00
Ray G. Daily; Wichita	No hunting license	9- 7-53	10.00
Lawrence Devillier; Wichita	No hunting license	9- 7-53	10.00
David Huffman; Larned	No hunting license	9- 7-53	10.00
Williard D. Packard; Wichita	No hunting license	9- 6-53	10.00
Farrel D. Phelps; Wichita	No hunting license	9- 5-53	10.00
Jessie Rosbia; Morrilton, Ark.	No hunting license	9-14-53	10.00
Robern L. Rosbia; Morrilton, Ark.	No hunting license	9-14-53	10.00
Curtis E. Taylor; Wichita	No hunting license	9- 7-53	10.00
Henry Lea; Chanute	Shooting dove not in flight	9- 5-53	10.00
Herbert J. Glotzback; Topeka	Shooting doves with unplugged gun	9-11-53	25.00
Gene L. James; Topeka	Shooting doves with unplugged gun	9-11-53	25.00
Louis L. Lannon; Topeka	Shooting doves with unplugged gun	9-13-53	25.00
Kenneth Brown; Phillipsburg	Possess pheasant in closed season	9-13-53	10.00
Kelly Kohler; Phillipsburg	Possess pheasant in closed season	9-13-53	10.00

<i>Name and address</i>	<i>Offense</i>	<i>Date of offense</i>	<i>Fine</i>
Tommy Stapelton; Phillipsburg	Possess pheasant in closed season	9-13-53	(Juvenile)
Clarence L. Arnold; Los Angeles, Cal.	No fishing license	8- -53	5.00
Alva Brookins; Salina (Mr. Brookins failed to produce a license within a reasonable length of time)	No fishing license	9-20-53	5.00
Jack Fields; Silver Lake	No fishing license	8-29-53	20.00
Mrs. Jack Fields; Silver Lake	No fishing license	8-29-53	10.00
James Fox; Herington	No fishing license	8-23-53	5.00
Ted Hurt; Herington	No fishing license	8-23-53	5.00
Steve Johnson, Jr.; Kansas City	No fishing license	9-13-53	5.00
Albert Johnston; Peabody	No fishing license	8-23-53	5.00
Jack Kleiner; Manhattan	No fishing license	8-29-53	10.00
Joseph C. Lee; Shreveport, La.	No fishing license	9-10-53	5.00
R. E. Mullins; Wichita	No fishing license	9-19-53	10.00
R. Nicoletti; Salina	No fishing license	7- 5-53	5.00
Clarence J. Reed; Newton	No fishing license	7-26-53	25.00
Thomas F. Simms; Hutchinson	No fishing license	9- -53	5.00
M. C. Stout; Pueblo, Colo.	No fishing license	9- 8-53	5.00
Marion Wallace; Kansas City	No fishing license	9- 7-53	10.00
Donald Waters; St. John	No fishing license	9- -53	5.00
Charles Wood; Salina	No fishing license	7- 5-53	5.00
Vincent Brinick; Pittsburg	Possess short channels	9-12-53	5.00
William J. Hercules; McFarland	Dynamiting fish	9-15-53	75.00
Richard D. Lee; McFarland	Dynamiting fish	9-15-53	75.00
Richard E. Lee; McFarland	Dynamiting fish	9-15-53	75.00
E. Anderson; Wichita	Operating trotline too close to mouth of stream	8-30-53	10.00
Cecil Guy; Hutchinson	Operating trotline too close to mouth of stream	8-30-53	10.00
Raymond Hecke; Kansas City	Operating trotline too close to mouth of stream	8-30-53	10.00
Floyd H. Wilbeck; Wichita	Operating trotline too close to mouth of stream	8-30-53	10.00
J. L. Cary; St. Paul	Operating too many throwlines and trotlines	9- 2-53	20.00
Kit Ralston; Holton	Operating too many throwlines and trotlines	9-12-53	20.00
W. W. Betton; Leavenworth	Too many hooks on untagged throwline	9- 7-53	10.00
Frank H. McCartee; Utica	Possession of illegal seine	9- 2-53	10.00
Osceola Crabtree; Kansas City, Mo. (also 30 days in jail)	Operate too many pole lines; misrepresentation	9-19-53	25.00
Eddie Jones; Kansas City	Operate too many pole lines	9-19-53	10.00
Wayne Love; Lawrence	Operate motorboat without permit and for other than fishing purposes	8-22-53	50.00

ARRESTS—OCTOBER, 1953

<i>Name and address</i>	<i>Offense</i>	<i>Date of offense</i>	<i>Fine</i>
Charles Ditzler; Topeka	No hunting license	9-13-53	\$10.00
Dean Post; Emporia	No hunting license; killing game animals in closed season	10-17-53	15.00
Ted Mechtley; Emporia	No hunting license; killing game animals in closed season	10-17-53	15.00
Phil Parker, Jr.; Burlingame	Killing game animals in closed season	10-17-53	10.00
H. D. Gibbons; Wichita	Killing coot while not in flight	10-24-53	15.00
Joseph E. Linscott; Wichita	Killing coot while not in flight	10-24-53	15.00
Virgil Sween; Wichita	Killing coot while not in flight	10-24-53	15.00
Alfred M. Cross; Great Bend	Taking migratory game birds with unplugged gun; to wit doves	9- 1-53	25.00
Bill J. Tomlinson; Great Bend	Taking migratory game birds with unplugged gun; to wit doves	9- 1-53	25.00
Francis Lee; Atchison	No hunting license; taking dove in closed season and not in flight	10-10-53	25.00
W. A. Williams; Kansas City	Taking dove in closed season	10-10-53	10.00
Earl W. Monger; Macksville	Hunt wild ducks on State Game Refuge, Pool No. 1 at Cheyenne Bottoms	10-23-53	25.00
Iris V. Monger; Macksville	Hunt wild ducks on State Game Refuge, Pool No. 1 at Cheyenne Bottoms	10-23-53	25.00
Jack Price; Salina	Hunt wild ducks on State Game Refuge, Pool No. 1 at Cheyenne Bottoms	10-25-53	25.00
C. R. Smith; Macksville	Hunt wild ducks on State Game Refuge, Pool No. 1 at Cheyenne Bottoms	10-23-53	25.00
John L. Kerns; Florence	Shooting and possession of pheasants in closed season	10-17-53	15.00
George Schamann; Dighton	Shooting and possession of pheasants in closed season	10-25-53	100.00
T. N. Peterson; Osage City	No hunting license; shoot quail in closed season; shooting from roadway without permission	10-21-53	35.00
Ulish Hays; Kansas City, Mo.	Misrepresentation	10-31-53	20.00
Jimmy Barnes; Wichita	No fishing license	7-25-53	5.00
Everett V. Cordell; Coffeyville	No fishing license	10- 1-53	5.00
Fred Harzfeld; Narka	No fishing license	10-18-53	10.00
Jack Heller; Enterprise	No fishing license	8-25-53	5.00
Dave Paden; St. Joseph, Mo.	No fishing license	10-20-53	5.00
Charles Roberts; Junction City	No fishing license	9- -53	5.00
Mary Roberts; Junction City	No fishing license	9- -53	5.00
Max O. Hawkins; Wichita	Short channel cats	10-11-53	5.00
Sonny Nolan; Kansas City	Operating too many lines and trotlines	10- 3-53	10.00
E. U. Watts; Kirwin	Operating too many lines and trotlines	10-18-53	10.00



Conservation Pledge

I GIVE MY
PLEDGE AS AN AMERICAN
TO SAVE AND FAITHFULLY TO
DEFEND FROM WASTE THE
NATURAL RESOURCES OF
MY COUNTRY - ITS SOIL
AND MINERALS, ITS
FORESTS, WATERS,
AND WILDLIFE

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