State of Iowa
1946

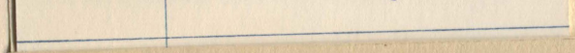
WILDLIFE RESOURCES

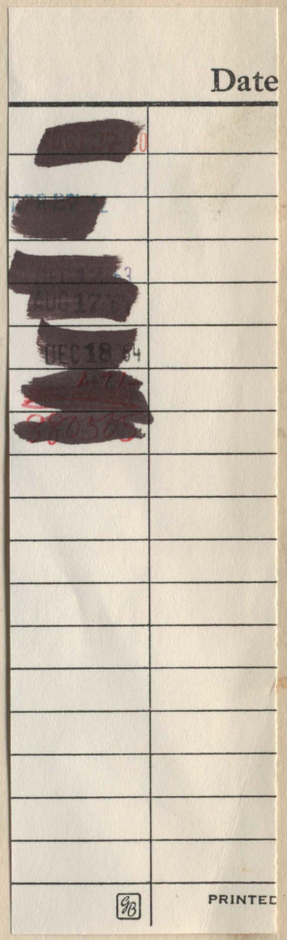
OF

IOWA

Prepared in 1943
Printed in 1946

Published by
THE STATE OF IOWA
Des Moines





WILDLIFE RESOURCES OF IOWA

by

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J. N. Darling

DEDICATION TO JAY N. DARLING

Jay N. (Ding) Darling was a member of the first Iowa Fish and Game Commission created by the 44th General Assembly in 1931. In March of 1934, he was appointed Chief of the U. S. Biological Survey, which later became the U. S. Fish and Wildlife Service; and in that capacity he was responsible for the establishment of the first federal migratory waterfowl production area in the United States. To him, the Dean of modern conservationists, this paper is affectionately dedicated.

INTRODUCTION

by

BRUCE F. STILES
Chief, Division of Fish and Game
State Conservation Commission

The purpose of this bulletin is to bring to the attention of the people of Iowa the intrinsic value of wildlife and its dependence upon the soil. First it is necessary to review briefly the past history of wildlife and point out the factors that during the latter part of the nineteenth and early part of the twentieth centuries reduced it to a mere remnant of that which the rich soil of Iowa did in the past and again now supports.

Either directly or indirectly all animal life is dependent upon plant life for its existence, and in its turn plant life is the product of favorable soil and water conditions. While existing soil can be improved by the addition of certain elements in which it is deficient, the actual creation of new soil requires vast periods of time that may be measured only in centuries or thousands of years; and so for any practical purposes, soil is beyond the ability of man to produce artificially and it at once becomes in conjunction with water our most valued possession.

In the beginning of historic times, Iowa probably supported one of the greatest populations of wildlife on the North American continent. Here for countless centuries where the grasslands of the West met the timberlands of the East this luxurious flora and fauna grew, flourished and decayed. It built up rich black loam, abundant in humus, nitrogen and lime, and the land was watered by a sufficient rainfall. As the raindrops collected into little rivulets, their runoff was retarded by innumerable grasses and rootlets that held the water back on the land and helped prevent the freshets and flash floods that today so seriously jeopardize our continued well-being by annually washing away tens of thousands of tons of our most valued possession, the soil.

Early settlers were amazed at the richness of Iowa's soil, the luxuriance of its vegetation and the abundance of its wildlife. That such great wealth could ever be exhausted was beyond their imagination. Yet by 1920 serious inroads upon these resources had been made. As the population increased greater demands were placed upon the land. Intensive farming was the vogue. Fence rows that formerly provided cover for wildlife were cleared. Timbered slopes that held the rainfall back on the high land were cleared and plowed. Marshes that

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served as water reservoirs were drained; and quiet streams that meandered through the meadows checking and retarding the runoff of water were straightened to provide more arable land, thus speeding up their flow, increasing the hazard of floods downstream, lowering the water table and causing serious loss of soil from erosion. At the same time these practices destroyed the habitat of wildlife.

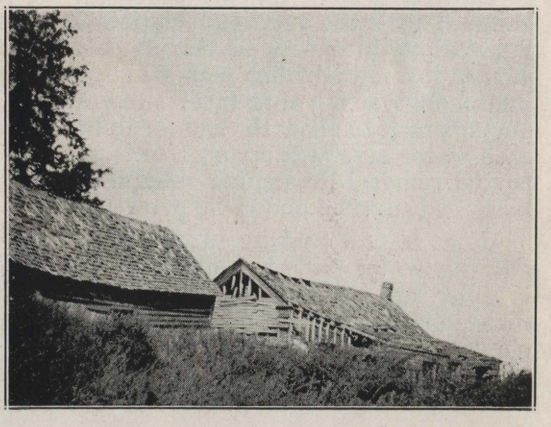
During the drouth years shortly after the first World War, we began to feel the effects of bad land and water management. Vast areas in the Midwest would no longer support their people. Bawling cattle in the parched Dakotas were shipped out by the trainloads because there was neither water nor food. In the Kansas dust bowl we witnessed the tragic migration of people from a land so misused that it would no longer support them. Even in our own state many southern Iowa farms were abandoned because the top soil from the sloping hillsides had washed away leaving deep gullies and bare hills where even weeds found difficulty in growing. True there was much fertile soil left and ways were continually being developed to increase the yield from each remaining acre, but that was not enough. People must have food and each exhausted or abandoned acre of land throws an additional burden upon that which remains

in production. Whether or not it is apparent, we cannot escape sharing our productive land with those less fortunate.

Our wildlife populations had reached an all-time low. Hunting in Iowa was little more than a memory. The season on quail was closed for 16 years and there was no pheasant hunting. The unchecked flood of domestic sewage and other pollutants into our streams and lakes was resulting in profound changes in aquatic life. Those few arch optimists who still ventured to wet a line in Iowa's turbid waters came home with empty creels and long faces. Over large parts of the state there were no game fish to be caught. Wild birds and animals require tangled thickets in which they may hide from their enemies, grasslands where they may build their homes and rear their young, untrimmed fence rows to serve as travel lanes from food patches to cover, and marshes, ponds, streams and all of the other elements that go to provide food, water, cover and security. Fish cannot live in silt-laden streams devoid of food or spawning areas.

Gradually Iowa people began to realize that all was not well. Studies in land use and wildlife management were carried on. Research projects were set up. The State Conservation Commission was created. The Iowa Cooperative Wildlife Research Unit was established; and the first soil conservation project was set up. The Iowa Department of Health and cities and towns instituted an intensive pollution abatement campaign.

Oddly enough the same land use practices that safeguard the soil make secure our wildlife populations. Contour farming, strip cropping, gully planting, little check dams and farm ponds, discontinuance of the practice of burning, controlled grazing and management of woodlots—now recognized as good



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Oddly enough the same land use practices that safeguard the soil make secure our wildlife populations. Contour farming, strip cropping, gully planting, check dams and farm ponds—now recognized as good farming practices—are at the same time good wildlife management practices.

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Wildlife should be treated as a crop and under proper management surpluses should be harvested just as we harvest our surpluses of hogs, chickens and other farm products. Each given area of land will carry through the winter just so much game. This is the maximum seedstock and should be protected. Populations in excess of this seedstock that may be built up during the reproducing period of spring and summer are limited in their survival to factors of environment, and it is sound management to allow the hunter to take this surplus. Similarly, each water area will accommodate a given fish population and partial removal by angling releases food and space permitting increased survival and rapid growth of younger fish.

Iowa is now making progress, but still has a long way to go. Our water table is rising. Pollution, while still a problem, is a far less serious menace to fish life than formerly as the consequence of widespread installation of sewage disposal plants. Eroded gullies are less numerous. Unproductive land is being gradually restored and our wildlife and fish populations are once more in a favorable position. From a state that was

almost completely shot out 20 years ago, Iowa has emerged as one of the best hunting and fishing states in the Midwest. Iowa now ranks thirteenth in the sale of hunting licenses, twelfth in the sale of fishing licenses, and ninth in the sale of migratory waterfowl hunting stamps. A fur crop worth about one million dollars is harvested annually in addition to some thirteen million pounds of fish and game.

FISHERIES OF IOWA

by

REEVE M. BAILEY
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Iowa State College

and

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Superintendent of Fisheries

Non-game Food Fish

Iowa is inhabited by some 140 species of fishes of which 30 are of varying importance as food fishes but are not considered game fish. The occurrence in our waters of vast numbers of these non-game fish constitutes an important real and potential food supply. Failure to utilize this resource fully is economically wasteful at any time, but under stress of general food shortage becomes inexcusable. Furthermore, removal of most of these fish has a beneficial effect on game fish since water, like soil, has a limited capacity for production, and where non-game fish are abundant the ability of the water to support game fish is reduced.

No accurate data are available on either the standing crop or the harvestable surplus, but it is conservatively estimated that the total poundage of the most abundant non-game fishes (carp, buffalofish, quillback, redhorse and other suckers, freshwater sheepshead and gar) exceeds the total game fish population in Iowa, and probably is several times as great.

Of the six-year average of some over 3,000,000 pounds landed, (see biennial reports of the Iowa Conservation Commission for specific data and tables) buffalofish rank as the most important, constituting 39 and 36 percent respectively, followed by sheepshead with 10 percent, catfishes six percent, bullheads three percent and quillback two percent.

In 1943, a total of 689 Iowans owned and operated commercial fishing gear in the boundary streams. Of this number 592 licensees operated on the Mississippi River and 91 on the Missou-

ri. In addition 74 non-residents were licensed to fish commercially in Iowa, and many wage earners were engaged in preparation, marketing and distribution of fishery products.

An unknown yield of non-game fish, chiefly carp, suckers and sheepshead, is taken annually by anglers, especially in metropolitan areas. The record of a single Des Moines bait dealer, who sold about 2,000 pounds of dough bait in 1942, is indicative of the popularity of sport-fishing for carp. Groups of from 10 or 20 to as many as 200 fishermen are familiar sights at and below dams and city bridges on summer evenings or on weekend afternoons. Angling for carp is intensively pursued in rivers throughout the state. Despite this activity, the hook and line take represents but a small percentage of the available number There exists a vast unharvested crop of non-game fishes in the inland streams.

The predominant non-game fish in Iowa is probably the carp, a species classified in the minnow family. Often referred to as "German" carp, the carp is in reality a native of the Orient whence it was introduced into Europe and thence widely distributed in the United States during the latter half of the last century. A highly adaptable species, the carp thrives in practically all of our waters. Almost equaled by the buffalofishes in gross commercial landings, it is far more abundant in the incompletely harvested river populations. Since carp are food competitors of game fish and in lakes are responsible for

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Half of the non-game food fishes of Iowa are members of the sucker family. Of these, the three buffalofishes are the most important.

destruction of aquatic vegetation and increased turbidity, the State Conservation Commission makes determined efforts to control their numbers in state-owned fishing waters. Restrictive measures are relatively ineffective in inland streams and utilization of the available surplus will require increased angling pressure or some form of commercialization.

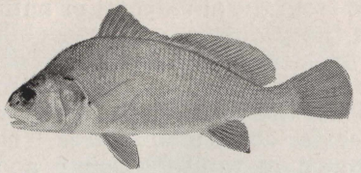
Half of the non-game food fishes of Iowa are members of the sucker family. Of these the three species of buffalofishes (bigmouth, smallmouth and black) are the most important. All occur in the large rivers and one or more species are found in all sizable streams in the state. Where found in lakes, buffalofish usually reverse the stream dominance of carp, and the rigorous control measures of the bigmouth species in large bodies of standing water are responsible for greater state landing of buffalofish than carp. Considered by some as a useful forage species for game fish, the rapid growth rate of the young soon provides them with size immunity to predation and renders them of small value as forage. They are regarded as of almost equal guilt with the carp in making the environment less suitable for game fish; hence, their control. Since buffalofish are rarely caught on hook and line, an increased yield for food is to a large extent dependent on increased com-

mercial efforts. As evidenced by poundage price paid for buffalofish, they are in greater market demand than carp.

Four species of quillback and carpsuckers occur in Iowa waters; all are similar in appearance and are customarily termed quillback. Found in moderate numbers in the boundary rivers and some lakes, their optimum habitat is in smaller streams, ranging in size from small creeks to the Cedar and Des Moines rivers. Here they occur in tremendous numbers, usually exceeding, always rivaling the carp in poundage. A considerable number are taken by anglers using doughballs and small hooks, but there can be no doubt that the yield is negligible in comparison with the available supply. An increase in netting operations would raise the yield, but because of operational difficulties in smaller streams it is doubtful that the return would provide adequate economic incentive to operators. Placement of fishways equipped with traps at dam locations on moderate or large-sized streams would appear to provide a feasible method of taking quillback in large numbers. Over 1,800 were taken in a single week at the height of the migration run in an experimental study conducted on the Iowa River at Iowa City.

Nine other species of suckers are of more or less importance as food fishes. Five, known variously as redhorses, whitehorses and mullet, are found primarily in creeks and rivers. The common sucker and hog sucker are found principally in streams of moderate size in northeastern Iowa. Spotted suckers are taken frequently in or near the Mississippi River. The blue, or Missouri, sucker is ranked as the finest food fish of its family. It is confined in its distribution to the channels of large rivers, especially the boundary streams. Formerly far more common than at present, its numbers have been depleted through overfishing by commercial operators. Restoration of an adequate population of this fish to permit a significant yield calls for complete closure of commercial fishing for several years. The total yield of these nine species of suckers amounts to considerably less than one percent of the catch of commercially licensed fishermen. Anglers take a considerable number of redhorse and common suckers, especially fishing with worms during the spring, at the time of the annual upstream spawning migration. In most rivers there are ample populations of redhorse and other suckers to provide a greatly increased anglers' take.

Among Iowa's non-game fishes the exploitation of the freshwater sheepshead, or drum, is probably more effective than for any other species. In all waters in which they are abundant they are harvested in quantity (largely by commercial methods), but serious exhaustion of brood stock is not apparent. Exceeded only by buffalofish and carp in net landings, they are taken in numbers in the Mississippi River and from the Oko-



The fresh-water sheepshead, or drum, is abundant in the Mississippi River and in the Okoboji lakes. They are harvested in quantity and are exceeded only by the buffalofish and carp in commercial landings.

boji lakes and Spirit Lake. In addition they are found in the Missouri River and its larger tributaries, but are there of minor importance. They do not ascend far into the tributaries of the Mississippi River. Formerly very abundant in Storm Lake, they suffered complete local extermination during the severe winter kill of 1935-36. A considerable number are taken by anglers, usually using crayfish for bait.

The longnose and shortnose gar are generally disliked by fishermen because of their strongly predacious habits and their interference with commercial fishing activities. Seldom is one taken on hook and line because of the resistant bony mouthparts. Gars are abundant in the boundary waters and in the lower portions of some of their larger tributaries. They also occur in the Okoboji lakes and Spirit Lake. If suitable methods of table preparation are developed and an adequate market demand is established, extensive production can be achieved, especially in the Mississippi River, which is heavily populated with the shortnose gar in particular. Anyone preparing gar for table use should be forewarned that the roe (eggs), unlike most fishes, are not only unpalatable but dangerously poisonous. During the cleaning process they should be destroyed lest poultry or other animals eat them.

In the past bowfins or fresh water dogfish were discarded by commercial fishermen, but now they are marketed and the six-year average of 53,824 pounds amounts to 2.8 perecent of the catch of licensed operators on the Mississippi. They appear to be absent from the Missouri drainage in Iowa, and ascend only short distances up the tributaries of the Mississippi. Bowfins are well regarded for their fighting qualities when hooked, but because of reputedly soft and tasteless flesh when prepared by conventional methods, few anglers retain their catch. Smoked bowfin is good, and part of the commercial catch is used in this way.

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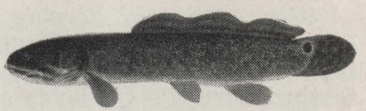


Most interesting of Iowa fishes from the standpoint of antiquity and bizarre appearance are the paddlefish, or "spoonbill cat," the rock sturgeon and the hackleback or sand sturgeon. All are large-water fishes living in the boundary waters. In Iowa they command a high price and the roe of each formerly constituted a source of domestic caviar at fabulous prices. The hackleback is still tolerably common in the Mississippi and Missouri rivers. The average annual yield of 19,145 pounds during the past six years comprises 0.9 per cent of the licensed commercial take.

Formerly common, the paddlefish and rock sturgeon are now so depleted that their extermination in Iowa seems inevitable unless rigorous protective measures are soon adopted. The paddlefish inhabits sluggish bayous and lakes as well as the open water of the large rivers. Once found in the Okoboji lakes, they were extirpated over a decade ago.

The U. S. Bureau of Fisheries reported the commercial catch of paddlefish in Iowa during 1922 to be 48,930 pounds; in 1931, 9,400 pounds. From 1937 to 1940 our figures (based on reports of licensed fishermen) are 2,465; 3,166; 0; and 15. In 1941 and 1942 none were reported. The known occurrence of young paddlefish in the Missouri River, and seining by state crews in its overflow waters, indicate that a limited population still survives there, where commercial fishing is less intensively pursued than on the Mississippi. Presumably few occur in the Mississippi now.

Expressed in terms of pounds of lake sturgeon taken for each reporting commercial fisherman, depletion is evidenced by a progressive decline from 17.3 pounds per fisherman in 1937 to 3.2 pounds in 1942.

The exhaustion in the supply of paddlefish and rock sturgeon may be due in part to changed environmental conditions including dam construction and navigation control measures on the boundary rivers, siltation and pollution. But it is virtually certain that over fishing has been a major factor in their decimation. Both species attain weights in excess of 100 pounds. Their rates of growth are slow and they are of large size, hence commercially desirable, before attaining sexual maturity. Because of their size and high value they are eagerly sought by fishermen, and neither is difficult to catch. It is believed that nothing short of complete protection for a period of many years can preserve these interesting species as part of our native fauna. Certainly they cannot provide any real contribution to our food supply or a significant return to the commercial fishermen in their present depleted condition.

Five species of herring and herring-like fishes occur in Iowa, but none is now of more than incidental economic importance. The mooneye and goldeye are often referred to as toothed herring. Goldeyes are very common in the Missouri

The American eel is encountered in various parts of the state, but is so infrequent that it is taken only incidentally in fishing for other species.

The burbot, or freshwater cod, is known in Iowa only in the eastern and western portions of the state where it is so rare as to be of no economic importance.

River and its larger tributaries, and occur in limited numbers in the Mississippi River. The mooneye is quite common in the Mississippi River. It receives some attention as a sport fish, but is of little value for food since it is bony and of poor taste. Ohio shad, a Mississippi River species related to the famed Atlantic shad, although said to be common in the Keokuk area is not taken in significant numbers. The flesh is reported to be in no way inferior to that of the Atlantic shad. Gizzard shad are very abundant in bayous and overflow lakes along the boundary rivers and their major tributaries. Long rejected as bony and of bad taste it has recently been said that when pickled they are not only palatable, but a highly desirable dish. Rapid spoilage of this species constitutes a major handling problem in any future commercialization of it.

The American eel, which spawns in the sea and must undertake an extensive migration to reach Iowa, is encountered occasionally in various parts of the state, but is so infrequent that it is taken only incidentally in fishing for other species.

The burbot, or freshwater cod, is known in Iowa only from the eastern and western portions of the state where it is so rare as to be of no economic importance. In the northern states and Canada large numbers are taken commercially.

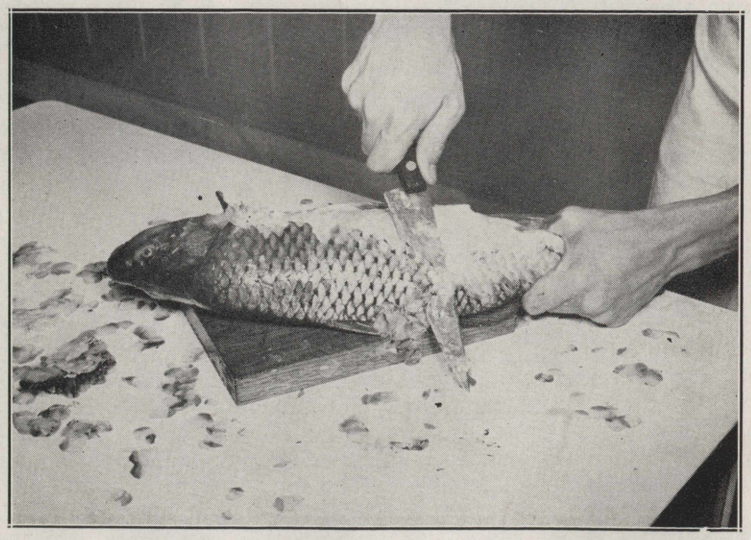
Among the commercial fishes of the boundary streams of Iowa the sturgeons, catfishes, bullheads, paddlefish, Ohio shad, northern pike and eel are excellent food fishes much sought and highly valued by epicures. A second group of fishes, including the carp, sheepshead, buffalofishes, quillback and suckers, constitutes the bulk of the commercial catch in Iowa. Widely used and regularly enjoyed by many, some Americans exclude them from the table. The reasons for rejection may be lack of familiarity with proper methods of preparation, improper techniques employed in cleaning, experience with poor tasting fish taken during the off season, or pure bias and prejudice. Except in the larger cities and centers of production, these fish are not readily available to the consumer. On the other hand, in Europe they are highly regarded and eaten in great quantities. Perfected methods of distribution and dissemination of information on methods of cooking might great-

ly increase consumption in Iowa. A third group of non-game fish are of limited use as food in Iowa. Standard table preparations are for the most part unsatisfactory, the flesh being soft or unpleasant. Investigations on the table preparation of these forms are much to be desired. Bowfin, mooneye, and goldeye are good when smoked. Burbot are commonly prepared as an excellent fish chowder in some areas where they are common. Gizzard shad are satisfactory when pickled. Gar are edible, but little information on the preparation of these fishes is available.

The Foods and Nutrition Department of Iowa State College, in cooperation with the State Conservation Commission, has conducted experimental studies on the home preparation of Iowa's most important commercial, non-game fishes, the buffalofish, carp and sheepshead. Results of these investigations are available in Bulletin P67 entitled "Eat Iowa Fish," which may be obtained free of charge from the Extension Division, Iowa State College, Ames, Iowa.

Game Fish

Angling provides a concrete contribution to the national food supply. This is more important now than formerly, a consequence, in part, of reduced commercial landings and transportational difficulties. During 1942 there were 239,091 licensed fishermen in Iowa (9.4 percent of the population), and landowners fishing on their own property, youths under 16 years of age and women (except those fishing in state-owned lakes) are not required to buy licenses. Since the Conservation Commission is not authorized to require reports of fishing success the average take per fisherman year is not known. If it is assumed to be 15 pounds the gross annual catch is over 3,500,000 pounds, if 25 pounds the total is nearly 6,000,000 pounds; either is surely a significant contribution in view of the shortage of protein foods, since it is equivalent to approximately one week's ration of meat for the entire population of the state.



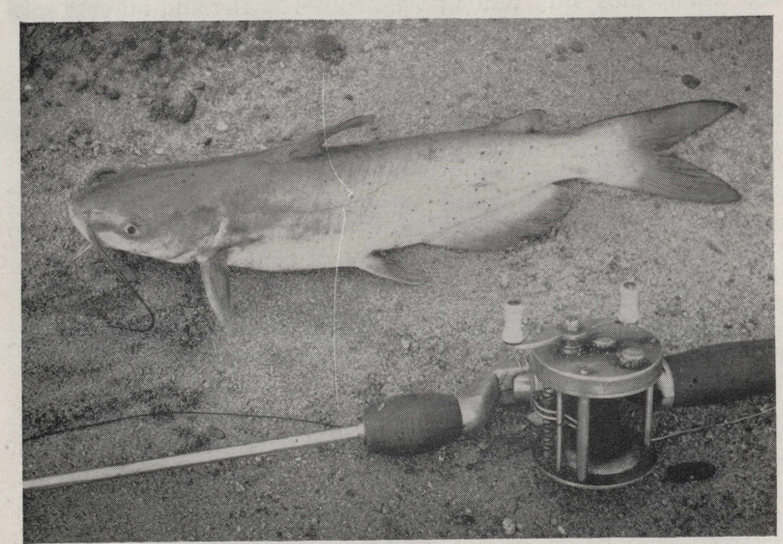
Experimental studies on home preparation of Iowa's most important commercial non-game fishes have been conducted. Results of these investigations are available in Bulletin P67 entitled "Eat Iowa Fish," which may be obtained free of charge from Iowa State College.

Freshwater fish are a rich source of proteins and certain essential minerals; they provide vitamins in moderate amounts, and the species vary among themselves in fat and oil content.

Whether or not angling is harvesting a crop less than, equal to, or greater than the natural rate of replacement is controversial. Precise data are almost wholly lacking in Iowa. Fisheries management workers are becoming increasingly aware of the general failure of anglers to crop waters to the limit of capacity for replacements. This is especially true in farm ponds, small lakes and large rivers, less so in those lakes which attract many vacationists. On the other hand, small trout streams are often so intensively fished that heavy artificial stocking is essential to maintain fishing. During the spring there is a heavy annual post-spawning mortality in some of our most heavily fished lakes. The dead fish are almost all large and simply die of old age. They succeed in surviving for their natural lives despite the fishermen's best efforts. This may be taken as evidence of underfishing in waters where such mortality occurs. Profoundly detrimental effects on game fish populations may and do commonly result from poor attention to soil and water conservation with attendant siltation and sharp fluctuations in water levels, stream ditching programs, pollution and other causes. But that overfishing, of itself, is a major cause of low game fish populations is doubtful. Most fish are very prolific, and in suitable waters will usually provide an ample replacement for those removed by angling. The angling take may be increased without endangering the future of fishing in most waters, but to permit spearing, netting, or other highly effective methods of capture might seriously endanger breeding stocks and for the present, at least, seems inadvisable.

No less than 25 game and panfishes occur in Iowa. Among these the catfishes are the most important. They are the most widespread over the state and occur in the greatest variety of environmental surroundings, make up the biggest part of the angler's take, are sought by the most fishermen and include

the largest of Iowa game fish. Channel catfish abound in all of the moderate to large-sized streams in the state and occur in some of the lakes. The giants among Iowa game fish, the chucklehead, or blue catfish, and the flathead catfish, also called shovelhead, mud or yellow cat (each of which often exceeds 50 pounds in weight), are of chief importance in large rivers and a few lakes. The ubiquitous bullheads (three species, the black, yellow and brown bullhead occur in Iowa) are found in almost all waters and furnish fishing to the majority of license holders. They are the "small boy's fish." Bullheads and channel catfish provide almost all of the stream fishing in southern Iowa. Catfishes are taken mainly by still-fishing on the bottom with night crawlers, cheese or blood baits, crayfish, shrimp tails, clams, or a variety of "secret" formulae.

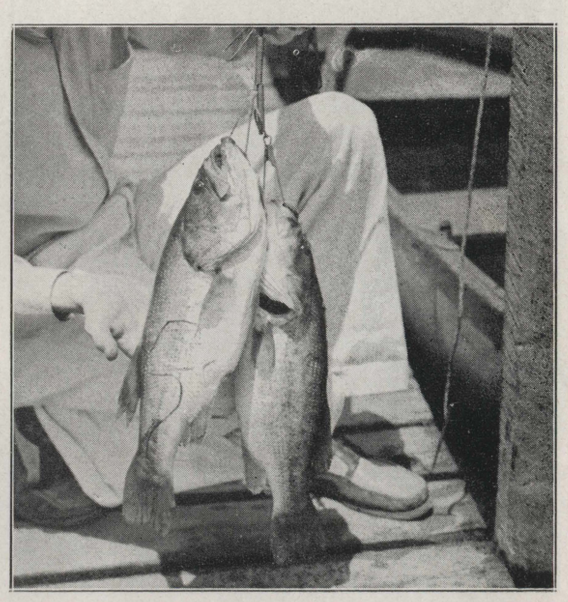


Catfish are distributed over the state and occur in the greatest variety of environmental surroundings. They are sought by the most fishermen and make up the largest part of the angler's take.

Eight species of the sunfish family are large enough to be desirable and common enough to be caught in numbers in Iowa. Of these the black basses, crappies and bluegill are the best known. The smallmouth bass, a justly famous game species, is common in moderate sized streams in north central and eastern Iowa, and occurs sparingly in some lakes. Its close relative, the largemouth, prefers lakes and sluggish streams, and is among the finest fish in the bulk of our artificial and naturally impounded waters. The bluegill, number one panfish

of the northern lake states, commonly shares the same type of waters as the largemouth. Together, the bluegill and the largemouth bass provide an optimum biological balance in small lakes and farm fish ponds, and in such places should be introduced to the exclusion of all other fishes. Crappies are state-wide in distribution, but are most abundant in lakes, ponds, and the slower moving streams. With the last two and bullheads they make up a large part of the game fish population in artificial lakes. Pumpkin seeds live in north Iowa lakes and in the Mississippi River. Warmouth bass are found in the Mississippi River and adjacent waters, and rock bass live in streams and lakes of northern Iowa in the same area inhabited by smallmouth bass. Green sunfish are extremely abundant throughout the state, and are much prized by youngsters, but they infrequently exceed six inches in length. A wide variety of live baits and artificial lures are successfully used in taking black bass and sunfishes. Worms, crayfish and minnows are the best live baits.

Three species of perches, the yellow perch, walleye pike, and sauger, are common in parts of Iowa, and at least the first two are among the most popular of our game fish. Yellow perch, almost exclusively a lake or bayou species, abound in Spirit and Okoboji lakes, Clear Lake, and various other lakes in northern Iowa. They are esteemed as one of the finest of table fish. Most are caught still-fishing with worms or small minnows, usually from a boat. Walleyes are abundant in the

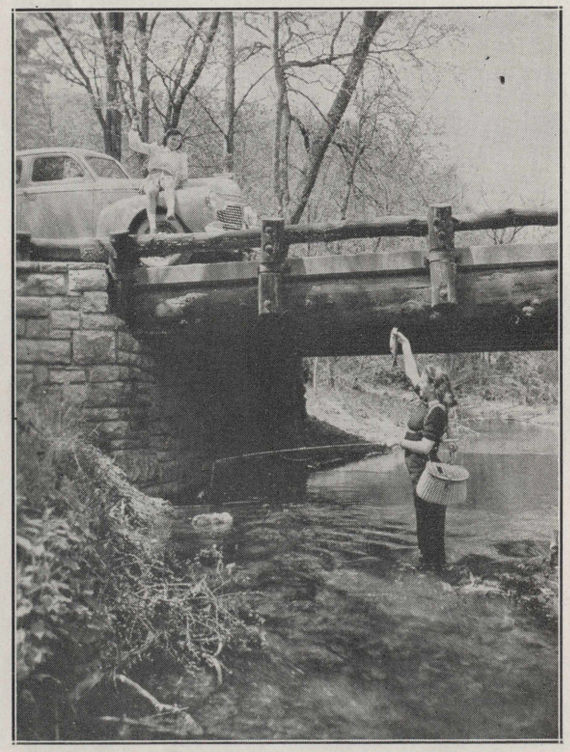


The largemouth bass prefers lakes and sluggish streams, and is one of the finest game fish in our artificial and naturally impounded waters

larger lakes and rivers of Iowa, saugers only in and near the boundary waters. They are game favorites. Usually the best fishing is at night from or near shore, casting with artificial lures. Many fishermen prefer to troll for them with live minnows during the day.

Yellow bass and white, or silver, bass are gregarious game fish which at times feed at the surface in large schools. Then they may be caught with facility, particularly with artificial lures, but at other times they are difficult to hook. Both species live in the Mississippi River. White bass occur commonly in certain north Iowa lakes and some of the southern reservoirs; yellow bass are found in Clear Lake, Hartwick Lake and Pine Lake, in all of which they were probably incidentally stocked from the Mississippi.

Northern pike, which were once very abundant in most Iowa waters, are now found chiefly in large rivers and lakes in the northern half of the state. Their large size makes them especially welcome to the angler. Plugs and spinners are used in taking most northerns. Muskellunge inhabited Iowa waters in the past, but if still present they are confused with northern



Brook, brown, and rainbow trout fishing is the joy of the Iowa Izaak Walton purist. It is restricted in Iowa to the small cool streams in the northeastern counties.

pike and are too rare to be of significance to the angler. The grass pickerel is a small species rarely exceeding a foot in length and is commonly confused with young northern pike. It is known in Iowa only from the eastern edge of the State.

Brook, brown, and rainbow trout fishing, the joy of the Izaak Walton purist, is restricted in Iowa to small, cool streams in the northeastern counties. Since natural reproduction in Iowa trout streams is negligible, good trout fishing is dependent on artificial stocking. It cannot be contended that trout are an important natural resource, but they do provide a valuable form of recreation. Trout are most commonly taken on wet, dry and spinner flies and a variety of natural baits, including worms, salmon eggs, grasshoppers and crickets.

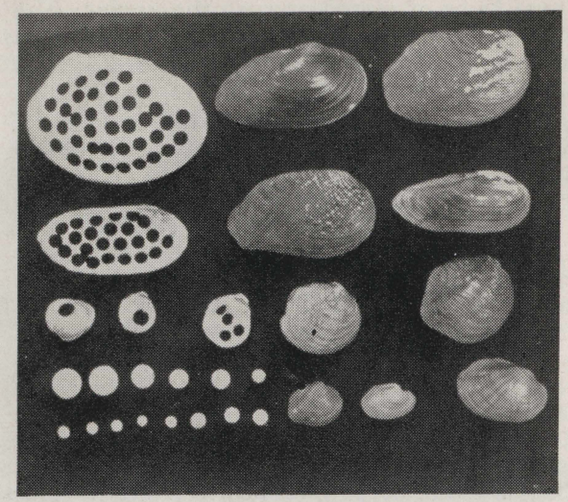
Primarily, angling provides intangible value through relaxation for overworked and jittery minds and jaded bodies. The weary may choose still-fishing for panfish from dock or boats in a lake or a shaded stream bank overlooking a favorite catfish hole. Desk-softened office workers may prefer a fly casting trek along a trout or bass stream, or plug casting for pike from a lake shore. Regardless of the method or "luck," the rewards are mental composure and physical well being, products of sun and wind, woods and water, and preoccupation with an endeavor in which "easy does it."

Fresh Water Mussels

Back in the golden days of the "Gay Ninties," when stern-wheel river packets plied the waters of the Mississippi, young industries sprouted and flourished in the booming river towns. Because of transportation facilities and the proximity of enormous shell beds, these cities were ideally located for pearl button manufacturing plants. Itinerant button-cutters drifted from town to town along the river, but Muscatine finally became the center of the industry where seven of the ten finishing factories are still located. Today some 2,000 Iowa families derive all or part of their income from the industry.

Originally, most of the shells were harvested from Iowa waters. It is no longer possible for Iowa to supply the entire demand of this industry, but all Iowa shells are processed by local factories.

From 1890 to 1910 the industry flourished, but at that time the threatened extinction of certain valuable commercial species prompted the U. S. Bureau of Fisheries to conduct an extensive investigation on artificial propagation of mussels, commonly called clams. (Correctly speaking, clams are found only in salt water). A well-equipped biological station was established at Fairport, where for a number of years studies were made on all aspects of mussels. (See studies on the reproduction and artificial propagation of fresh-water mussels—Bulletin Bureau of Fisheries Vol. 30, 1910.)



Muscatine became the center of the world's pearl button industry and seven finishing factories are still located in this city.

Early statistics on mussel fisheries are incomplete, but those available show that yields varied sharply from year to year. This was probably due to a multiplicity of factors, among them the siltation of the beds following construction of wing-dams in the Mississippi, over-exploitation of the industry, increased pollution, fluctuation of water levels on the inland streams caused by the manipulation of power dams and extensive soil erosion from the watersheds. The closing of portions of certain productive streams for the purpose of rebuilding surpluses also influenced the harvest. Market prices had a decisive bearing on the number of people engaged in the take.

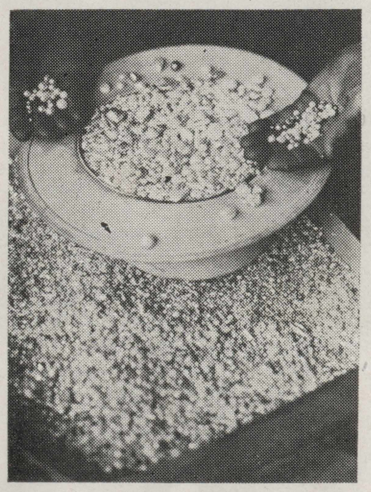
The camps of the "clam-diggers" are a familiar sight along the Mississippi and certain of the inland streams. The collecting equipment of a clamming crew usually includes a small, flat-bottomed boat fitted with one or more crow-foot bars and long iron pipes with blunt "treble hooks" suspended from stagings. When these bars are pulled over the shell beds on the bottom of the stream and the hooks come in contact with the mussels, they "bite" or clamp to the hooks. The bars are raised to the surface at intervals and the mussels are removed. Another commonly used collecting method is termed "pollywogging." The clammer wades the stream and picks up mussels as he finds them, either by sight or by feeling them with hands or feet. At camp the mussels are placed in a shallow vat of hot water which is heated by a small firebox. Hot water and the steam produced under a burlap or wooden cover kill the mussels quickly and the shells spread apart. They are scooped out onto a drying rack and the meat is then easily extracted from the shell. The bodies, which are high in protein content, are usually given to farmers for hog and poultry food. Currently a clamming camp (usually of two or three people) collects about a ton of shells weekly. The established price for better Iowa shells is now approximately $60.00 per ton.

Over a 23-year period, the important mussel-producing streams in Iowa have been the Mississippi, Cedar, Des Moines, Shellrock, Wapsipinicon, Iowa and Skunk rivers in order of production. Currently the Mississippi River is producing most of the shells, although the upper reaches of the Cedar and Shellrock rivers (opened in 1943 by administrative order of the State Conservation Commission) are producing heavily. The most important Iowa shells used in the button industry include the mucket, pocket-book, three ridge, maple leaf, sandshell and pigtoes, with the first three species predominating.

Aside from the numerous types of pearl buttons, which are manufactured for a multitude of purposes, shells have gained wide popularity in the novelty trade for costume jewelry, belt buckles, ash trays, knife handles and all manner of trinkets.

Pearls and "slugs," or asymmetrical pearls, are sometimes found in these mussels. A number of years ago a pearl taken near Harpers Ferry sold locally for $2,500 and is said to have been resold for several times that amount in an Eastern market. Several pearls valued at more than $1,000 have been taken from Iowa mussels. Fresh-water pearls have been largely replaced by imitation and artificially cultured pearls.

Mussels also supply a considerable amount of food for certain native animals and fishes. Large quantities are consumed by muskrats as evidenced by piles of empty shells adjacent to their dens along the streams. Most Iowa fishes, particularly the sheepshead and catfishes, consume the smaller mussels.



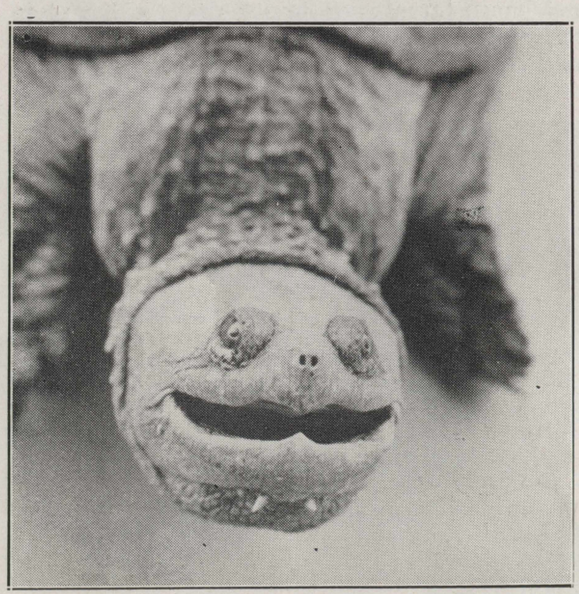
Pearls and "slugs," or asymmetrical pearls, are often found in mussels. Their value, however, has declined in recent times because of widespread use of imitation and artificially cultured pearls.

Surplus mussel crops, like any others, should be harvested; but ample seedstocks should be left to perpetuate the species and insure an adequate supply.

Turtle, Frogs and Crayfish

In addition to fish, there are other wild cold-blooded animals which are excellent to eat, but little used in Iowa. Chief among these are turtles, frogs and crayfishes. All are abundant in and near permanent water throughout the state. Taking these animals requires no extensive equipment or specialized knowledge, but does require a certain amount of time and effort. All are delicious foods, and amply pay for the trouble to catch and prepare them.

Of the dozen or so species of turtles found in Iowa only the snapping and soft-shelled turtles should be eaten; the others are too small, have a strong or bitter taste, or are too rare or local in distribution to be readily available. Snapping turtles are preferable to soft-shelled, but the latter are highly acceptable. Snappers are abundant throughout the state, being found in temporary and shallow ponds as well as in all permanent streams and lakes. A single good-sized snapper (five to ten pounds or more) will serve a large family. Its taste is distinctive but approaches chicken more closely than other conventional meats. (For methods of cleaning and cooking snapping turtles see the "Iowa Conservationist," Volume 1, Number 10,



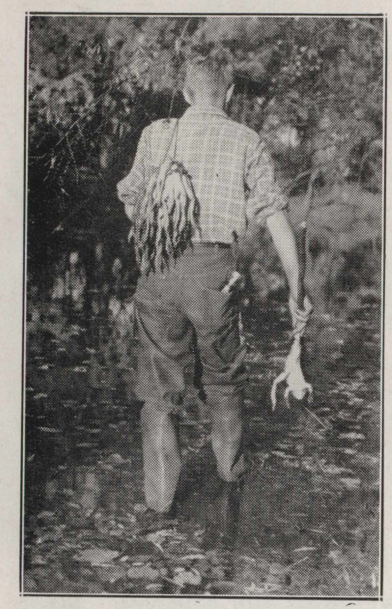
Snapping turtles are abundant throughout the state being found in temporary as well as permanent streams and lakes.

November, 1942.) The turtle may even come from a stagnant mud-bottomed pond, but seems not to acquire a disagreeable taste, as fish commonly do when caught in an unfavorable environment. Probably no more than one or two percent of Iowa snappers ever reach the kitchen, certainly a major waste of a harvestable natural resource.

Many effective methods of catching snappers are available. Snappers may often be seen moving about in shallow ponds and streams and can be easily captured by hand. Although the powerful jaws are dangerous, a snapper picked up by the tail and held safely away from the body is harmless. Expert turtle catchers commonly locate turtles while buried in the mud of a stream or lake by means of a long slender iron rod or wooden probe. Wading along in shallow water the hunter repeatedly thrusts the "divining rod" into the mud. When resistance is encountered the rod can be inverted and the hooked end used to extricate the prize from its hiding place. This method sounds like hunting a needle in a haystack, but is highly effective if utilized where snappers are known to occur. The hoopnet type of turtle trap constructed of netting and equipped with an inverted conical entry way and baited with meat scraps, chicken entrails, or fresh fish is standard equipment for commercial turtle trappers. The trap should extend above the water level to prevent drowning of the captives. These traps are illegal in Iowa except in boundary waters, but basking traps, which take advantage of the sunning propensities of turtles, may be used, and are highly effective.

Frog legs are a recognized favorite of epicures and gourmets. Traditionally, bullfrogs are the favorite, but any sizable frog is equally tasty. Although all but the legs is usually discarded this is entirely unnecessary since the whole animal is equally edible. Frogs are easily skinned and cleaned, and any good cook book provides recipes for their preparation.

In Iowa bullfrogs occur in the southern counties and along the Mississippi River. They may be locally common, but have been badly depleted by overly zealous hunting. (The present daily bag limit of four dozen should be revised downward for this species, since it provides far more meat than needed by a moderate-sized family for one meal and encourages commercialization.) The leopard frog (green or bronze with black spots) is abundant near permanent and semi-permanent waters everywhere in Iowa. The legs of eight or ten average-sized frogs provide an ample serving for one person. In eastern Iowa the green frog (sometimes called little bullfrog) is common, and since it is slightly larger than the leopard frog, is preferred. Frogs are most easily captured at night with a light; they can be caught with a dip net or by hand. Daylight collecting for bullfrogs may be accomplished by catching them on a fish hook baited with a bit of red flannel dangled before them. Leopard frogs and green frogs may often be captured with a dip net or by hand, but where deep water is available they usually escape.



Frogs are recognized favorite of epicures and gourmets.

In addition to the three frogs mentioned above, there are six species of frogs and four kinds of toads. Four diminutive frogs, including the tree frogs, are best known to us by virtue of their springtime choruses. The pickerel frog is restricted to cool springs and the borders of trout streams near the eastern edge of the state. A rather large species, the crayfish frog, is fairly common in the southeastern counties where it may be found in crayfish burrows.

Crayfish are closely related to the marine lobster but in Iowa seem to have gained little of their larger cousin's reputation, but equal it as a table delicacy. True, it takes from one to two dozen to provide an average serving, but that should constitute no difficulty. Crayfish, like lobster, should be killed by dropping alive into boiling water. The powerful tail muscle is the only edible part; this is easily removed from the shell. Like pork, crayfish should always be thoroughly cooked to destroy parasites. They may be prepared in the same manner as fresh shrimp, or after boiling, rolled in a batter of eggs and cracker crumbs and fried. They are also delicious spiced. Crayfish are found in a variety of situations. Some live under rocks and stones in riffle areas of streams; these can be captured with a small screen or minnow net held downstream of the rocks as they are dislodged. Others abound in small ponds where they may be readily obtained with the aid of a minnow seine. Still others inhabit burrows in low meadows and marshy pastures. They can be dug from their retreats with a spading fork. About seven species of crayfish are found in Iowa.

BIRDS AND MAMMALS

by

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and

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Birds

The growing list of recent Iowa birds contains at least 371 names. Recorded only as winter visitors are 29 kinds; spring and fall migrants, 148; permanent residents, 47; and casual or accidental visitors, 36. At least 150 kinds are recorded as breeding within the state in the past 25 years.

In size our birds range from the ruby-throated hummingbird, 3.5 inches long from tip of bill to end of tail, to the whistling swan, 54 inches long.

At least 150 kinds of birds are recorded as breeding within the state in the past 25 years. The redstart is included in this number.

The values of birds are too great to be calculated easily in monetary terms. Everyone enjoys the return of birds in spring and notices them frequently through the summer. The fall migration and the association with birds feeding at winter stations are pleasures yearly anticipated. An increasing number of people are participating in pleasures of bird study and of reading articles and books on bird topics. The healthful pursuit of game birds continues to be among the most popular of sports. The insect-consuming habit of birds is well known. In the general economy of the state and nation, the money values of clothing and special equipment and assistance in the study and utilization of birds may be estimated in millions of dollars.

By law the waterfowl, cranes, rails, shorebirds, gallinaceous birds and doves are termed game birds of which only a surplus may be taken in ways, within limits, in numbers and at times set by statute and Conservation Commission regulations. Approximately one-half of the game birds, namely, swans, cranes, rails except coot, shorebirds, wild turkey, prairie chicken, sharp-tailed grouse, ruffed grouse, and doves are fully protected throughout the year now.

Birds other than game are designated non-game in laws. They are not to be hunted and their nests in use and eggs are not to be disturbed or destroyed, except sharp-shinned and Cooper's hawks, great horned owl, crow, starling and English sparrow. It is not intended that these six unprotected birds shall be hunted relentlessly, but that they may be destroyed when annoying or destructive. The flesh of the crow, starling and English sparrow is palatable and could be used more extensively for human food. Nearly all of the non-game birds, many of which are migratory, are protected by Canadian and United States federal laws as well as state provision.

Among the protected non-game birds are loons, grebes, pelicans, cormorants, herons, egrets, bitterns, ibises, jaegers, gulls, terns and kingfishers, seen usually near water. Except for three previously cited, the some 20 kinds of vultures, hawks, eagles and owls may not be taken in any manner because of their well-known rodent destroying and scavenging abilities. Approximately one-half of the birds of the state are commonly known as songbirds, although correctly the cuckoos, nighthawks, whippoorwill, swift, hummingbird, woodpeckers, kingbirds and other flycatchers are not properly included in that group. The protected true songbirds include horned larks, swallows, blue jay, chickadees, titmouse, nuthatches, brown creeper, wrens, mockingbird, catbird, brown thrasher, robin, bluebird and other thrushes, blue-gray gnatcatcher, kinglets, pipits, waxwings, shrikes, vireos, wood warblers, meadowlarks, orioles, blackbirds, tanagers, grosbeaks, buntings, dickcissel, finches, redpolls, siskin, goldfinch, crossbills, towhees, native sparrows and longspurs.

Many of the fish-eating birds are among the protected non-game species, including the gulls, terns, herons, and kingfishers.

The number of nesting birds in the state runs into millions. Using the estimate of one pair of nesting birds to an acre, perhaps there would be about 70,000,000 parent birds here in summer and two to three times as many feathered individuals by fall. With provision of additional protection, food and nesting cover in a proper soil conservation program, this number will be doubled at least. Iowa is in the great Mississippi River flyway flown by millions of birds in each spring and fall migration, and more use this flyway than any other. Many western birds move up and down the Missouri River at the state's western border. Perhaps a billion birds visit or fly over Iowa in migration. Hence our state has great opportunities for bird observation and study as well as great responsibilities in caring for the millions of feathered visitors and residents.

Upland Game Birds

Present day upland game birds of Iowa are those that fit in well with modern intensive farming. The ring-necked pheasant is the most numerous upland game bird, predominating in central and northern counties, whereas the bob-white quail is the most abundant game bird in southern counties. Ruffed grouse are found in limited numbers in timbered areas of the northeast, while the range of the Hungarian partridge is restricted chiefly to prairie counties of the northwest. The

Roughed grouse, though rare, is included in the nesting birds which have been estimated at one pair nesting for each acre of Iowa land.

prairie chicken, once abundant throughout the state, is still occasionally found nesting in isolated areas where grasslands are quite extensive, and numbers migrate into Iowa during the winter. But because of changed conditions no hope is held for reestablishing it as an important game bird. The wild turkey is extinct in Iowa, except for two or three small flocks that have been introduced. But increased state-owned forests might make possible the restoration of this bird in limited numbers. Acquisition of such forest lands might likewise increase the range of the ruffed grouse. The mourning dove though abundant in Iowa is not hunted as a game bird.

The Ring-necked Pheasant

Pheasants thrive in largest numbers in the north central counties, where in the fall their population density has in some areas been as great as one bird to the acre. There the level land is crossed by numerous drainage ditches and dotted with small marshes and farmstead groves of trees, all of which are used by the pheasant for shelter in severe winter weather. The

general farming of the region, with about one-third of the acreage in corn, one-third in small grains and the remainder in hay and pasture, supplies food, nesting and rearing cover to the birds.

The mechanical cornpicker, now widely used, leaves scattered shelled corn in the fields, that with occasional fields of corn left standing through the winter furnish an adequate winter food supply. During emergency winter periods pheasants often feed with the livestock in farm feed lots, and at such times many farm families as well as sportsmen and conservationists put out feed for the pheasants. Although the pheasant is primarily a seedeater, during the spring and summer much of its diet consists of cutworms, grasshoppers and other insects. Most of the damage to sprouting corn formerly blamed on the pheasant has been shown to be committed by ground squirrels. The breeding stock of pheasants is safeguarded by limiting the hunters' take to the surplus population, by providing them with refuges and by emergency winter feeding carried on by farmers and other sportsmen. It is possible that by good management the 1943 pheasant shooting area of 59 counties may be even further extended.

As estimated 684,000 male pheasants were taken in 59 northern and central counties in the fall season of 1942, and 70,000

Pheasants thrive in largest numbers in our north central counties. This pheasant hen has found a nesting site in the clover field.

male and female pheasants in the late winter season of early 1943. This harvest of the 1942 hunting year's surplus pheasants supplied us with about 1,508,000 pounds of food. Approximately 1,250,000 pheasants remained in the breeding stock that was tripled by fall. A 37-day open season in 32 northern counties and a 11-day season in 27 eastern and central counties, with a daily limit of five cocks and one hen and a possession limit of 18 birds, was the longest season and the largest bag limit in the 18 years of pheasant hunting in the state. An abundant seedstock was left for the 1943 fall season.

The Bob-white Quail

The bob-white is seen in largest numbers in several southeast counties with a population as high as a bird to one acre. Hilly farmland, with thickets along fence lines, with trees and shrubs along creeks, and with frequent headed gullies, supplies the shelter against enemies and cold winter weather. On such farms about one-fourth of the land is in small fields of corn and small grain, and three-fourths in hay and pasture. The islands of bluegrass and other herbs around shrubbery in light-

The bob-white quail is seen in largest numbers in several south and southeast counties where populations are often as high as a bird to the acre.

ly grazed timber pastures are favored for nesting. During most rearing seasons free water is found in the creeks and trickling in the gullies and is believed essential to good bob-white production.

Ordinarily, waste grain of the fields and weed seeds of the pastures and grain fields supply sufficient food. Occasional unhusked cornfields attract quail in winter, particularly where shelter cover is abundant. Winter food patches of corn or sorghum are advised especially for bob-whites in the fields distant from farmsteads. Coveys around farmsteads usually are fed by farmers in bad weather and even cared for in the buildings. Bob-white quail, though primarily seedeaters, are known to eat many kinds of destructive insects and are never accused of damage to crops.

The breeding stock is safeguarded by limiting the shooting to the surplus, by providing adequate refuges, and by emergency feeding carried on by farmers and other sportsmen. Bob-white quail may be appreciably increased in southwest Iowa counties only by a carefully planned long-term program of proper land use practices involving soil conservation, restoration and storage of water, re-establishment of cover and grasslands, and general improvement of farming methods such as contour farming, strip cropping, construction of farm ponds and re-planting of gullies, steep slopes and other waste areas. Through similar practices, undoubtedly, in some counties north of the present shooting area, quail can be increased to harvestable surpluses.

Approximately 120,000 bob-whites were harvested in 30 southern and east-central counties in the fall season of 1942. They furnished about 40,000 pounds of food. An estimated 1943 breeding stock of 480,000 bob-whites was nearly tripled by fall. A 45-day open season with a daily and possession bag limit of eight birds in 35 southern counties was the longest quail season and over the largest open area of any year since the taking of bob-whites was legalized again in 1933 following a 16-year closed period.

Waterfowl and Marsh Birds

Twenty-nine kinds of ducks and six kinds of geese are found in Iowa. Approximately 10,000,000 ducks and geese come down from the north to Iowa in the fall migration. The spring migration of geese along the Missouri River is much greater than in the fall.

Mallards and pintails are the most important puddle ducks. They are early spring migrants and many mallards remain in Iowa well into the winter. Blue-winged teal are among the first to leave in autumn and the 1943 season, beginning September 25, permitted Iowa hunters to take more of this duck popula-

Approximately 10,000,000 ducks and geese come down from the north into Iowa during the fall migration.

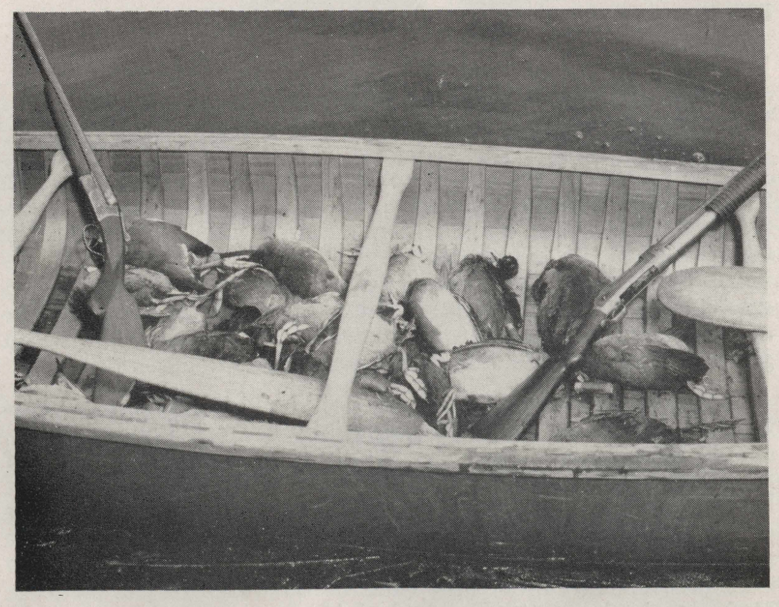
tion than in previous recent years. The lesser scaup, commonly called bluebill, is among the most numerous of the diving ducks and the last of this group to come down in the fall.

Puddle ducks such as gadwall, baldpate, wood duck, shoveller and black duck are less numerous than mallards and pintails. Greater scaup, buffle-head, goldeneye, canvasback, redhead and ring-necked ducks are diving ducks less often taken than the lesser scaup. The puddle ducks are so-called because they get their food in shallow water, tipping up to feed on the bottom, seldom diving deeper than three feet, whereas the diving ducks frequently dive for food in deep water. Both groups feed more on plant material than on animal food. The ruddy duck is chiefly a plant eater, whereas the mergansers eat more animal matter than plant matter. Mergansers generally do not eat many game fishes, but take some soft fishes. Mergansers are not taken commonly for human food. The great "duck factory" is in Canada and states along the United States' boundary. The breeding stock is safeguarded largely by controlled shooting of only a surplus. Great marsh areas in Canada and the United States could rear even more birds than they do at present.

About 250,000 ducks and 350 geese were harvested in the state in the 1942 season. At one pound per duck and four pounds per goose, dressed, these waterfowl supplied about 251,400 pounds of human food. In most years the waterfowl shooting is best along the Missouri and Mississippi rivers and at the marshes and lakes of northern counties. An estimated 50,000 ducks, chiefly blue-winged teal, mallards and redheads are reared in and around marshes of northern counties and a few scattered localities of the state. Restoration of marshes, increased numbers of large farm ponds, and stabilized flows of large rivers will aid in spreading the ducks over the state.

American Coot

The coot is a prized game bird in several eastern states and is relished by many people who prefer it to some of the ducks that Iowa hunters seek. The coot is an omnivorous feeder. Like geese, it can be seen grazing on grass near marshes. The food of young coots, like that of young ducks, is about one-half plant materials: roots, stems, leaves and some seeds. The adult coots feed chiefly on plant material, which makes up about 90



An estimated 25,000 American coots are reared in marshes of the state yearly, particularly in the northwest counties.

percent of their diet. The leaves, stems and roots, with seeds of pond weeds when obtainable, sedges, grasses and algae are major foods of the adult coot. The animal food, about 10 per cent of the diet, is chiefly insects. The food of the coot is as clean, then, as that of any duck or upland game bird in the state.

An estimated 25,000 American coots are reared in marshes of the state yearly, particularly in the northwest counties. About 1,000,000 additional coots migrating from the north are available to hunters in the fall season.

Mammals

Today, 56 kinds of wild mammals are known to occur in Iowa. Smallest is the Hoy pigmy shrew, about 3.3 inches long from tip of nose to end of tail, and largest, the whitetailed deer, about 36 inches tall at the shoulders and twice as long. There are seven species of ground-living moles and shrews that are chiefly insect eaters and seven flying insectivorous bats. The carnivores are 13 in number, the rodents 25 and the rabbits two.

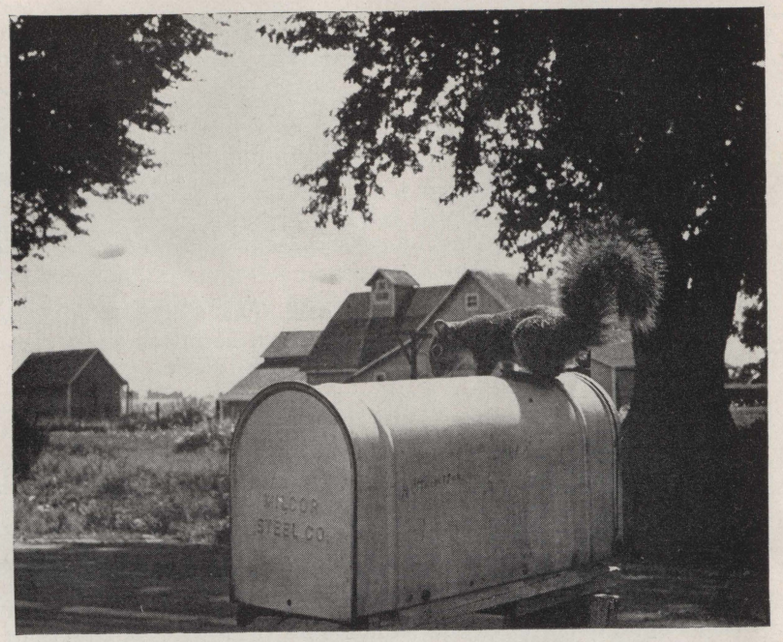
In law the squirrels, rabbits and deer are termed game, and the following are designated furbearing: opossum, raccoon, weasel, mink, otter, spotted skunk or civet cat, skunk, badger, red fox, gray fox, coyote, wolf, ground hog, beaver and muskrat.

Food Mammals

Squirrels and Ground Hogs

The two large game squirrels of the state are the western fox squirrel, widely distributed, and the northern gray squirrel, mostly found in the eastern counties where there is more native timber. The gray squirrel likes dense bottomland timber with plenty of nut trees. The fox squirrel is often found on wooded slopes and ridges and in semi-open tracts. Farm groves and town trees support fox squirrels, and the animals feed a great deal on corn.

Trees along streams, on steep slopes and in gullies are beneficial to squirrels. Nut trees, especially hickories and walnuts, should be planted in greater numbers, although the keys of maples and winged fruits of elms, as well as several kinds of berries, are eaten. Where too numerous, as in city and state parks, squirrels may strip the bark from trees and eat enough tree buds to disfigure the trees; and around farmsteads they may eat through roofs and sides of buildings to get at corn. Under such circumstances control is necessary, which may be arranged for by consulting the local State Conservation Officer.



The tree squirrels are an important part of our wildlife and as many as 320,000 have been taken by hunters in a single year.

In 1942, 320,000 squirrels were taken. At one pound each dressed, they provided 320,000 pounds of human food. An abundant seedstock was left, in fact, too abundant in parts of southern counties.

The ground hog, or woodchuck, present in all counties, is most commonly found at the edges of wooded areas. Young woodchucks in midsummer are favorite game in several eastern states. The woodchuck may damage crops, particularly gardens, at times and hence no attempts are made to safeguard the population. Burrows dug by woodchucks are frequented by several species of furbearers and by cottontails, and in this way ground hogs often benefit more valuable species.

Rabbits

Mearns cottontail is the most popular game mammal in the state and is generally more abundant in the southern than in the northern part of the state. In the fall of 1938, cottontails were estimated at one to two per acre over extensive areas of southern counties. In 1943, because tularemia depleted the breeding stock in southern Iowa to a low number several years ago, the cottontail was more numerous in northern counties

The Mearns cottontail is the most popular game mammal in the state and is generally more abundant in the southern than in the northern part.

where the disease was less widespread. The white-tailed jack rabbit is more numerous in northwestern counties than elsewhere, though it is present in all parts of the state.

The cottontail requires shelter such as thickets, tall grass, brush or wood piles, culverts and ground holes in which to take shelter from predators and cold weather. Such shelter at 200-yard intervals with food such as legumes, grasses and cereal crops between provides well for cottontails. Even woven wire fences, which check the movements of dogs and foxes pursuing the cottontail, are of assistance to the rabbit, whereas such fences are a handicap to the jack rabbit, which is slow in getting through such hazards. Hence the jack rabbit does better in large open fields where is depends on running and spurts of speed to get away from predators.

The cottontail bears about four litters each averaging five young a season. But not all of these survive. A fairly low breeding stock of cottontails in excellent environment and dur-

The cottontail bears about four litters a season, each averaging five young and the annual increase under certain conditions may be as great as 500 per cent.

ing normal weather may increase as much as 500 percent in a year, whereas an average breeding stock may increase only about 250 percent in like environment and weather. Investigation has also shown that an area filled with rabbits in the fall will lose its surplus to predators or through moving to other areas. Hence, an area ideal in cover with two to four cottontails to an acre in fall may have three-fourths of its number taken by hunters without injuring the breeding stock.

The jack rabbit dresses about three pounds and the cottontail one and three-fourths pounds. In the 1942 season an estimated 1,216,000 rabbits, netting 2,140,500 pounds of food, were taken by the numerous hunters without injuring the seedstock.

White-tailed Deer

An estimated 1,000 deer range in the few suitable timbered regions. The largest herds are along the Des Moines River in the vicinity of the Ledges State Park, in southern Washington and northern Henry counties, along the Nishnabotna River in Pottawattamie and Shelby counties and along the Mississippi River in northeast counties. Although comparatively few in number, deer are frequently reported to damage farmers' crops and Iowa's timber cannot support deer well. Legislation passed by the 50th General Assembly permits the State Conservation Commission to take deer where crop damage occurs.

Fur and Food Mammals

Muskrat

The muskrat is the most numerous and valuable furbearer of the state. It is widely distributed in marshes, at lake edges, in creeks, drainage ditches and rivers. Heretofore the animal has not been used extensively as human food in our state, although it is popular in the east and the south, where it is commonly known as marsh rabbit when served at the table. The muskrat is not really a rat, and its flesh when properly cooked has a rich delicious flavor. There is more objection to the muskrat for food, then, than there is to squirrels and woodchucks, which are also rodents, or to rabbits, which are closely related to rodents. The 250,000 to 500,000 muskrats taken in normal years might supply 250,000 to 500,000 pounds of human food.

A breeding female muskrat usually bears two or three litters averaging six or seven to a litter. Females usually bear more young when the breeding population is moderately low in relation to the usable environment. Stabilized water levels are very essential to the welfare of the muskrat. About three-fourths of the muskrats of a heavily populated marsh, stream or ditch bank may be taken and yet leave enough breeding stock for a favorable season the next year.

The muskrat is the most numerous and valuable furbearer in Iowa. From 250,000 to 500,000 are taken each year.

The muskrat takes almost entirely plant material as food. Rushes and cattails are favorite marsh foods. A great variety of plants including corn and soybeans may be taken on land near streams and even lakes and marshes. But the ears of corn eaten by the muskrat pay well in profits from muskrat pelts and food returns. Acre for acre and in relation to expenditure of time and money for development, care and trapping, a good natural muskrat marsh may pay as well, or better, than any other acre on the farm.

According to fur buyers' reports 262,562 were taken in 1942 and 350,700 in 1940. At an average pelt value of $1.47 the muskrat netted trappers $385,966.14 in the 1942-43 season. In the 1943-44 season the muskrat harvest was 722,360 and the average pelt value was $2.25, which yielded $1,625,310.00.

The Raccoon

Although raccoons occur in every county, they are most numerous along forested streams of eastern and southern counties. The raccoon is seldom seen more than a mile away from

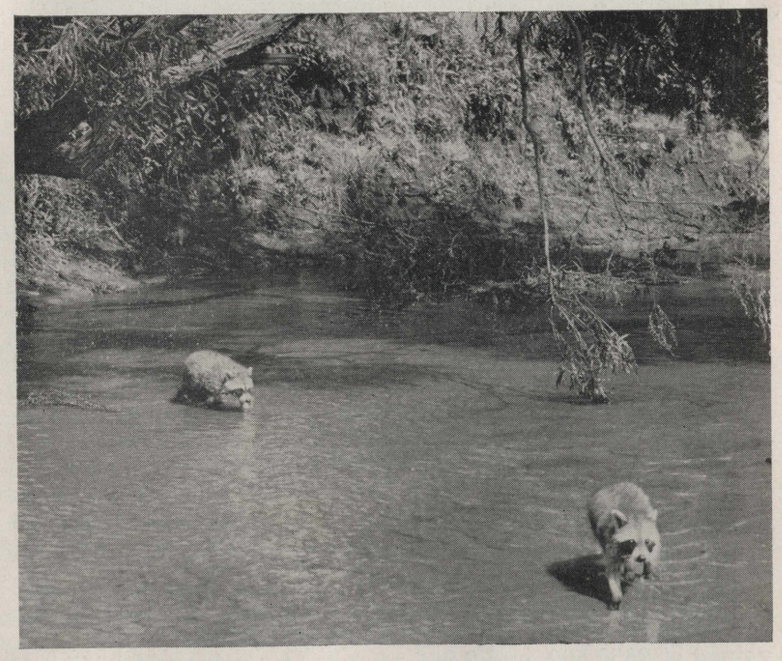
wooded streams. It is a favorite game mammal with many and has greatly increased in numbers in recent years.

Raccoons eat berries in season, some insects and a great variety of other natural foods. Mulberry, hackberry, plum and cherry trees planted along streams, gullies and fence rows attract and increase raccoons. They also eat corn, both in the milk and mature states. In winter raccoons hibernate to a limited degree for some weeks in hollows of trees or other cavities, and the trapping season is closed to protect them at that time. Leaving large hollow den trees will increase raccoons. Cutting hollow trees is seriously damaging to raccoons which need them for rearing young as well as for hibernation.

In the 1943 season, 38,303 raccoons were taken in the state at a value of $277,696.75. At 10 pounds a dressed raccoon, these furnished 383,030 pounds of food, part of which was consumed by humans.

The Beaver

Beaver were reported from 63 of the 99 counties in 1942 and are probably present in several others. They are most



Raccoons occur in every county, but are most numerous along the streams of our eastern and southern counties.

numerous in the Missouri River watershed. There are an estimated 10,000 beavers in the state. The 1943 value of beaver pelts was $25.00 to $50.00, and beaver may be used as human food. The 50th General Assembly passed legislation permitting the taking of beaver under a permit system where the animals were doing damage. Beavers sometimes consume corn, but as with the muskrat, the corn then brings good returns when the animals are pelted. Bark of willows, cottonwoods and other soft wood trees along streams is their major food.

The Opossum

The opossum, found in all counties, is most numerous in southern wooded areas. Widely used in southern states, the opossum should be eaten by more folk in this state. The opossum eats a great variety of foods.

In the 1943 season 35,579 opossum pelts were taken and were valued at $23,126.35. Averaging four pounds dressed, the 35,579 furnished 142,316 pounds of food, little of which was utilized.

Fur Bearing Mammals

Skunks, Mink, Weasel

Mink and weasel are rather uniformly distributed. The spotted and striped skunks are found in all counties, the spotted more numerous in southern counties and the striped more uniformly distributed. These closely related animals of the weasel family are primarily flesh-eating. All eat mice and other rodents. Skunks take many insects. Mink are less apt to utilize this type of food and feed rather extensively on muskrats. Investigation has shown that the muskrats taken by mink are those not well cared for in over-crowded environment, and that if the mink didn't take them something else would happen to the surplus muskrats. As the mink is a fine fur animal the muskrats eaten by it, when mink are trapped, are less of a loss than if taken by disease or other agencies. Investigations continue to show that skunks and weasels are not serious predators on game birds and rabbits. In good cover the game birds and rabbits thrive despite skunks and weasels, whereas, without good shelter and food cover, game birds and rabbits are scarce.

Then these furbearers are assets for fur. In the 1943 season 113,437 skunks' pelts valued at $277,923.85, 52,760 minks valued at $659,500, and 3,966 weasels at a value of $6,345 were taken.

Badger, Fox and Coyote

The badger is an animal of open fields, particularly large grazed pastures in which ground squirrels, its most common food, occur. The tunnels of the badger are beneficial as rabbit dens. Some rabbits are eaten by the badger, but not enough are often taken to materially reduce rabbit populations.

The badger at times has high value as a furbearer because the long white-tipped hairs are used to decorate black fox neck pieces to make them look like silver fox, and to make brushes.

In the 1943 season, 538 badgers valued at $4.00 a pelt yieldel $2,152.00.

Red fox are found over all the state, but are least numerous in the heavily wooded areas of eastern counties where the gray fox predominates. Fox feed largely on mice and rabbits. The damage to poultry is slight.

Red fox are found all over the state, but are least numerous in the heavily wooded areas of eastern counties where the gray fox predominates.

Coyotes are widespread in distribution and are occasionally too numerous for the best interests of livestock, particularly sheep. Under such conditions their numbers should be reduced.

The red fox has considerable fur value, and 8,695 foxes at a value of $88,950 were taken in the 1943 season. Also 2,516 gray fox at $7,548 and 926 coyotes at $9,260 were marketed.