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Okoboji Region of Iowa.

T.C. Stephens

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The Summer Birds of the Lake Okoboji
Region of Iowa

by
T. C. STEPHENS



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The Summer Birds of the Lake Okoboji
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1938

THE SUMMER BIRDS OF THE LAKE OKOBOJI REGION OF IOWA

The geographical area treated in this report is limited to Dickinson County, Iowa, and often referred to as the lake region of Iowa. From an ornithological point of view there is probably no more interesting area in the State of Iowa than the Okoboji region. The existence of the lakes and marshes with their peculiar and abundant vegetation affords certain habitats not commonly found in a prairie country. Such conditions are, of course, reflected in the bird life. And yet no adequate study has ever been made at the center of this area so rich ornithologically. No check-list for the region has ever been published.

As early as 1882 a letter written by Mr. A. A. Mosher was published in *Forest and Stream* (12) on "The fauna of Spirit Lake." This article gives some very valuable information as to the water fowl and game birds of the region at that time. While the article seems to have been written for the purpose of conveying to sportsmen some information concerning the abundance of game and the attractiveness of the region as a hunters' resort, yet the facts presented are also of value to the ornithologist. Quite a number of species of birds which are now known only as migrants were counted as breeding species at the time Mosher wrote. Notes and quotations from Mosher's paper will be made at various places in the present catalogue. Some species were reported by Mosher which can not be included in the present catalogue because of extirpation. Such are the "Great White" and Sandhill Cranes, swans (which species is not stated), pelicans (the White Pelican); among the nesting ducks are mentioned mallards, teal, widgeons, pintails, spoonbills, and wood ducks.

Anderson's "Birds of Iowa" (1) contains a number of records (less than twenty) belonging to Dickinson County, and presented on the authority of several different observers. Since explicit data are not given with any of these county records in Dr. Anderson's work, it is impossible to locate the records of any particular season of the year; it seems inadvisable, therefore, to make particular reference in the present paper to these Dickinson County records.

The adjacent prairie counties of O'Brien, Clay, and Palo Alto have received some attention. In 1914 Tinker (19) published a list of the summer birds for the prairie region immediately south of Dickinson County. This list contained eighty-six species; but ten of these were not considered to be breeding species; and it is doubtful also if the Bald Eagle and the Snowy Owl could be considered as resident species at that time. Tinker's list contains two breeding species which are not included in the present list for Dickinson County, namely, the Long-eared Owl, and the Western Henslow's Sparrow. Two other birds are reported merely as different subspecies, namely the Western Grasshopper Sparrow and the Long-tailed Chickadee. The 1914 paper by Gabrielson (7) gives a summer list of species found in the county adjacent to Dickinson on the south, and includes fifty species, all of which are found in the present list for Dickinson County.

In 1917 Gabrielson (8) published a list of 136 species for Clay and O'Brien Counties. This list is not restricted to summer birds, and does not purport to be complete. It does not include any certain breeding species which are not contained in that author's 1914 list. So far as the writer can learn, this reviews all of the published ornithological work which has been done in Dickinson and adjacent counties.

The present list contains 116 species which are considered as *summer birds*, i.e., birds which have been observed during the summer months of June, July or August. Of these, the nest or young of sixty-seven has been definitely observed; and we may safely assume that twenty-three more species in the list breed, making a total of ninety breeding species.

The studies upon which the present paper is based were carried on during ten summers, from 1911 to 1919, inclusive, and 1921. Generally the season of work covered about six weeks, but in 1912, 1915, 1919, and 1921 it extended through about ten weeks.¹ Much of the time was spent in the field, and two or three more or less extensive trips on foot were made to various parts of the lake region, on the average, each week.

¹ The specific dates for the ten seasons of field study are as follows:

1911 — June 17 to August 10	1916 — June 19 to August 12
1912 — June 16 to September 3	1917 — June 17 to July 30
1913 — June 16 to August 5	1918 — June 15 to July 27
1914 — June 24 to August 3	1919 — June 12 to September 2
1915 — June 21 to August 26	1921 — June 23 to August 30

The author desires to acknowledge his obligation to Professors T. H. Macbride, B. Shimek, and R. B. Wylie, of the University of Iowa, who have in different years acted as the Directors of the Iowa Lakeside Laboratory, from which institution the work has been carried on. The author has enjoyed the facilities of the Laboratory during the ten seasons of work. His thanks are also extended to Professor Frank A. Stromsten, also of the University, and in charge of zoological research at the Laboratory, for friendly encouragement; and to Professor Charles R. Keyes, of Cornell College, for critically reading the manuscript and for many helpful suggestions. During the summer of 1922, while in Iowa City, Dr. H. C. Oberholser kindly went over the list and made suggestions on nomenclature, for which the author is very grateful.

Dickinson County lies in the northern tier of counties in Iowa, and is the third county from the western boundary of the State. Its dimensions are seventeen miles from north to south, and twenty-four miles from east to west. It lies on the west slope of the state divide,² which runs practically north and south, and contains some of the highest altitude within the State. All of the drainage is to the westward, and eventually reaches the Missouri River. It is an interesting fact that all of the fluviatile fauna belongs to the Missouri drainage system, which has never been adequately surveyed biologically. This relation has very little effect upon the bird life; but that it may have some bearing has been pointed out by the writer in a previous paper (15).

All but the southwestern corner of Dickinson County lies within the Wisconsin drift area. This drift, being the most recent of the series, is characterized by an undeveloped drainage. Further than this, most of the Wisconsin area in Dickinson County, and all of the region immediately surrounding the lakes, consists of terminal or recessional moraine. Thus, the region under discussion includes a surface of great unevenness. In more descriptive language, the region consists of undulating prairies, with numerous mounds, or kames, interspersed with many shallow depressions containing water, which are known as sloughs and kettle-holes.

The comparatively recent formation of the surface within the Wisconsin drift area, which covers our region, results in a much

² According to Dr. Carman's report (Iowa Geol. Survey 26: 233-445, 1915) the divide crosses the northeastern corner of Dickinson County, covering a relatively small area.

younger state of the creek and river beds; and much of the whole area has not yet found a complete outlet. The region abounds, therefore, in sloughs and marshes of small size. For example, Professor Shimek's map shows twenty-two kettle-holes in, or encroaching upon, Section 22, Lakeville Township, which is immediately west of the Laboratory. Most of these have now been artificially drained; probably not more than two or three still contain water.

As the term is ordinarily used, a kettle-hole has no outlet nor inlet. Its loss is mainly by seepage and evaporation. A slough, on the other hand, may have both an inlet and an outlet.

The chief river drainage is that of the Little Sioux River, which traverses the entire western third of the County from north to south. Through its tributaries it drains Silver, Diamond, Pratt, Sylvan, and Pillsbury's Lakes within the County; the last three of these lakes, have, however, been made dry by artificial drainage. The Little Sioux River occupies a rather broad, deep valley in the middle part of the County; and here the stream is bordered in places by rather dense growths of willows, and in other places by heavier growths of bur oak forest.

Stony Creek crosses the southwestern corner of the County, and Muddy Creek crosses the southeastern corner; but, so far as the writer knows, neither of these creeks has any ornithological interest.

The larger lakes form the major topographical features of the region. Lake Okoboji occupies the exact center of the County, and is about five and one-half miles long by about two and one-half miles wide at one point; throughout the greater part of its length, however, it is not over one mile in width. Its shore is varied; in places it is sandy beach, eroded gravel cliff, or walled with boulders. It may be bordered with meadow, slough, narrow forest margin, or dense woodland. While somewhat less in area than Spirit Lake, West Okoboji Lake is much deeper, more irregular and picturesque. For these reasons a much greater extent of shore line is occupied by cottages on Okoboji than on Spirit Lake.

Connecting with the east shore of West Okoboji Lake there is a chain of narrow lakes, aggregating about six miles in length; these are known as East Okoboji Lakes, or the East Lakes. They are shallow and average about a quarter of a mile in width, but were formerly navigated by the small steamboats. North of this chain, and connected only by a spillway, lies Spirit Lake. This lake extends to, and across, the Minnesota state line.

The water level of Spirit Lake is about seven or eight feet higher than the Okoboji Lakes, and is separated from them, except for the spillway, by a narrow strip of land, less than a quarter of a mile wide. Spirit Lake is probably not over thirty feet deep, while the maximum depth of West Okoboji Lake is given by Ford³ as 132 feet. A group of small lakes, including Little Spirit, Hottes, and Marble Lakes, lie almost in contact with the upper end of Spirit Lake. Other small lakes of the region are Center, Diamond, Prairie, the Gar Lakes, etc. The considerable number of named lakes fails to give any notion of the many times greater number of unnamed and unmapped sloughs and kettle-holes, all of which must play an important part in attracting birds, both during the breeding and migrating seasons.

A BREEDING GROUND FOR WILD FOWL

Formerly the lake region of Iowa must have been a wonderful breeding ground for wild fowl and water birds of many kinds. According to Mosher (1882) swans, pelicans, herons, cranes, loons, and cormorants nested in greater or less numbers. Among the wild fowl which nested as far back as the eighties he mentioned the Mallard, the Widgeon (Baldpate), the Pintail, the Spoonbill (Shoveller), the Wood Duck, the Teal (Blue-winged, probably), and the Canada Goose; and most of these, apparently, bred in abundance. Only three of these named are now known to nest here, and these in very small numbers.

The factors which have destroyed or modified the natural breeding and feeding ground of the wild fowl in this region are at least four in number, which may be enumerated as follows: (a) drainage; (b) cattle and hogs; (c) sucker fish; (d) water level. Of course man is responsible for all of these factors, and need not be distinctly mentioned. Although the presence of human population would, in itself, preclude the breeding of wild fowl in the same numbers as in the early days, yet that factor does not exterminate, rapidly, at least. This is evidenced by the fact that a very few ducks still breed in the region. Rapidity of extermination is due to other factors, with man as the indirect cause, and which we may now consider.

³ Ford, H. C. "A topographical survey of the Spirit and Okoboji Lakes region." Bull. Iowa State Coll., 11 (6): 1-38. Ames, 1913.

Drainage

The rough, glacial topography of the region, together with the lack of natural drainage, which is characteristic of recently formed drift, left innumerable sloughs and small bodies of water varying from a few rods in diameter to an area of a quarter or half a section. Such ponds and kettle-holes cover fertile soil, and wherever it could be readily accomplished, even at considerable expense, these ponds and kettle-holes and sloughs have been drained artificially. While such drainage has been considerable, still there are plenty of water surfaces left in various parts of the region. Each water surface drained is, of course, a step toward complete drainage; but while so many water surfaces remain as now do, the writer can not believe that this has been a great factor, *per se*, in excluding breeding. Nevertheless, continued drainage is bound to destroy not only the breeding grounds, but also many of the feeding grounds for the water birds of this region.

Cattle and Hogs

The vegetation bordering any slough or kettle-hole is very quickly eliminated when cattle or hogs have access to it. With the destruction of the aquatic vegetation around the margin the environment is ruined as a breeding place for these birds. This is a difficult problem because it involves the question of private ownership. Some of the best of these water areas should undoubtedly be preserved by public money or through private donation.

Soft, or Sucker, Fish

It seems to be a well-known fact, among sportsmen at least, that carp destroy aquatic vegetation. Forbes and Richardson (*Fishes of Illinois*, 1920, 106) state that carp "often pull up the roots of tender aquatic plants while feeding."

The vegetation in some of the lakes and sloughs which formerly gave food and nesting sites to the ducks has disappeared in recent years. Formerly there was a considerable stand of rushes (*Scirpus validus*) and other vegetation at the south end of Lower Gar Lake. The writer observed this as late as the summer of 1913, at least, and noticed several species of ducks hiding in it. All of this aquatic vegetation has long since disappeared, and this part of the lake is quite bare.

Other smaller bodies of water have lost their plant growths in

the same way, and at about the same time. Running south from Emerson's Bay for nearly a mile there is a narrow slough, which has been called "Green Slough" by some writers. Formerly the margins of this slough were densely grown up with sedges, rushes, and grasses. This vegetation harbored many nesting birds, such as the Prairie Marsh Wrens, Red-winged and Yellow-headed Blackbirds, Pied-billed Grebes, Florida Gallinules, one or more species of rails, and doubtless other species at times; we may feel quite sure that ducks bred there in earlier times, and I have seen broods of Blue-winged Teal on this water as recently as the summer of 1911. By 1921 all of this aquatic vegetation had disappeared, and the slough was bare.

Running across between this slough and Emerson's Bay a rock wall has been constructed. In low water the two bodies of water are completely disconnected; but in high water there is ample communication through the crevices of the rock wall. This circumstance will have a bearing in explaining the passage of fish into the slough from the lake.

Precisely the same thing has occurred in another long slough south of Center Lake, sometimes called "Mile-long Slough," where an almost identical bird fauna was previously known. Since about 1919 the standing vegetation in this slough has been practically absent; and the birds have also been lacking. Cattle and hogs have access to parts of this slough, and they may have played a minor part in the destruction of the marginal vegetation.

While direct evidence is lacking, the writer has adopted the hypothesis that the carp are responsible for the destruction of vegetation in these, and perhaps in other, bodies of water; and in this more or less indirect way the fish are ecologically related to the bird life of the region. The fish destroy the wild rice and the wild celery (*Vallisneria*) upon which the ducks feed; and they probably uproot the different species of *Scirpus*, *Typha*, the sedges, etc., which afford concealment and nesting sites for many species of aquatic birds.

Perhaps the Buffalo fish may play some minor part in the destruction of standing vegetation, although this presumption seems to contain a greater element of doubt than in the case of the carp. Buffalo fish are known to feed upon algae and duckweed (*Lemna*) to some extent. Forbes and Richardson (*Fishes of Illinois*, 1920, 67) make this statement concerning the Buffalo fish: "The feeding

habits of the buffaloes, like those of all fishes inhabiting the muddy waters of central Illinois, are difficult of observation, but several fishermen and other river men have reported to us that these fish have the habit of whirling around in shallow water, or plowing steadily along with their heads buried in the mud, their bodies in an oblique position, and their tails occasionally showing above the surface. These operations have nothing to do with spawning, and probably indicate a search for small mollusks and insect larvae in the mud."

Mosher, writing in 1882, states that the Buffalo fish occurs in the lakes in "immense numbers." And yet in the thirty-odd years following that date no one seems to have noticed any depredations upon the aquatic vegetation of the lakes. As well as can be determined the carp seem to have been introduced into the lakes somewhere near 1908-1912. Writing to me in the fall of 1921 Mr. W. B. Shoemaker says: "I will venture to say that the carp made their first appearance here between ten and eleven years ago, and were carried here with minnows which were seined in the rivers."

It is taken for granted by the fishermen around the lakes that the carp got into the lakes first, that is, before they got into adjacent sloughs. Then within three or four years after the water level became high enough (in 1915) to allow the fish of the lakes (including the carp) access to the adjacent sloughs the aquatic vegetation of those sloughs vanished. This again seems to be circumstantial evidence against the carp; while the case against the Buffalo fish does not seem to be strengthened.

Water Level

For several years (at least four or five) prior to 1915 the level of the lakes was considerably lower than in subsequent years. The higher level of the lakes from 1915 onward was probably due to the erection of a new dam at the outlet of the lakes, although the writer has not ascertained the year in which this dam was constructed. During these earlier years the sandspit in Miller's Bay was very fully exposed above water. From 1915 onward it was completely submerged.

In the years of low water the sloughs spoken of in a preceding paragraph had very poor, if any, connection with the lake. Supposing that the carp were first introduced into the main lake, probably with a consignment of minnows as has been suggested, then

the higher water level would explain the entrance of the carp into the adjacent sloughs; and the presence of the carp there would explain the disappearance of the aquatic vegetation, and the absence of water birds, where they were formerly abundant. It is in this way that a relation between water level and bird life is traced.

HABITATS

No especial attempt has been made to organize the ecological data relating to bird life. The region presents the usual habitats. The only peculiarity lies, perhaps, in the relative importance of certain ones. They may be enumerated as follows:

The Prairies and Open Fields

The chief feature of this habitat, stated negatively, is the absence of trees. There are, here and there, spots of virgin prairie; but for the most part the original prairie has now been converted into cultivated fields, pastures, and meadows. By the term pasture we mean a grass field which is grazed. The typical breeding birds of the pasture are the Western Meadowlark, the Prairie Horned Lark, and the Burrowing Owl. A meadow is a field of wild grass, with more or less weed growth, which is not grazed. Such meadows in this region are usually on low, and more or less damp, ground; otherwise they would not be allowed to go unused, even though they are often cut for wild hay. With the meadow we may include the dry kettle-hole. As examples of meadow-nesting birds we may name the Bobolink, the Short-billed Marsh Wren, the Short-eared Owl, the Marsh Hawk, the Grasshopper Sparrow, etc.

Most of the acreage in this habitat is planted in corn or oats, and this is negligible so far as bird life is concerned. In such cultivated portions the birds, which might have been scattered over the entire area, are concentrated along the roadsides. And so, in walking along the roadways, one is able to see practically all of the prairie birds of the region. Other prairie species not mentioned above are, the Prairie Chicken, Lark Sparrow, Upland Plover, Vesper Sparrow, Migrant Shrike, and the Dickcissel.

The Woodland, or Forest

Of course, such timber as we have in Dickinson County is hardly extensive enough to justify the term "forest," yet we may have occasion to use the term "forest-margin," meaning simply the edge of the wooded area. Professor B. Shimek has very carefully mapped

all of the wooded areas in the immediate lake region, and these maps have been published in two bulletins issued by the University of Iowa.⁴

Perhaps nine-tenths of the shore of West Lake Okoboji is more or less wooded. The depth of this timber zone varies from zero to approximately half a mile. The east shore of the lake is more heavily wooded than the west shore; except that a broad promontory of land, about a mile wide, which projects into the lake between Miller's Bay and Emerson's Bay, is almost completely covered with timber. On East Okoboji Lake the densest timber is on the east shore, reaching a depth of about half a mile for a distance of about two miles. It is the general rule that all of the bodies of water large enough to be called lakes have some timber standing along the shore in places, if only the narrowest fringe. The dominant species in such timber is always the bur oak (*Quercus macrocarpa* Gray).

The birds which are found in this local habitat are, for the most part, those which are characteristic of woodland in general. To illustrate this group we may mention especially the Red-eyed Vireo, Downy and Hairy Woodpeckers, Black-capped Chickadee, White-breasted Nuthatch, Western House Wren, and Blue Jay. For several years a pair of Cooper's Hawks nested in the woods at Elm Crest. The Wood Thrush and the Crested Flycatcher seemed to occur only locally in certain parts of the region.

Among the woodland birds not present the Towhee should be especially mentioned. I have seen it only once in the region during the ten seasons of field work. The region seems to furnish an abundance of typical habitat for this species; but the lake region is so completely surrounded with prairie, that it seems likely that the Towhee is unwilling to cross the open country in migration. The Cardinal has not as yet been found here. It will eventually enter the lake region, beyond a doubt. It is present in the lower parts of the Little Sioux Valley, and is constantly pushing its range northward. Some of the stretches along the upper part of the Little Sioux Valley are very meagerly wooded, which will doubtless retard the northward movement of this species.

The "forest margin" is rather an indefinite habitat, and yet there are a few species which can not well be classified elsewhere.

⁴ Shimek, B. "Plant Geography of the Lake Okoboji region." Bull. Lab. Nat. Hist. Univ. Iowa, 7: 3-93, 1915. And,

Anon. "The Iowa Lakeside Laboratory, at Lake Okoboji." Univ. Iowa Studies, 1 (No. 6): March, 1919.

The Indigo Bunting, Yellow-billed and Black-billed Cuckoos, Scarlet Tanager, Yellow-throated Vireo, Baltimore and Orchard Orioles, Rose-breasted Grosbeak, Warbling Vireo, Yellow Warbler, Brown Thrasher, Catbird, and possibly the Alder Flycatcher, may be included in the list of birds of the forest margin; and there are a few others that might also be placed here.

Sloughs and Kettle-holes

Some discussion of these topographical areas has been given in the preceding paragraphs. The vegetation does not seem to be essentially different in the two bodies of water, and usually very distinct zonation exists. Roughly speaking, and only for the purposes of bird study, we may divide this habitat into three zones. The outer zone of vegetation grows on the moist earth, and recedes with the season, as the water evaporates; a middle zone consists of rushes, sedges, cattails, and other forms growing beneath and projecting above the water surface; an inner zone of open water may contain more or less submerged vegetation. Frequently minor zonation can be recognized in each of the first two, but it is probably not such as to affect the bird life.

The three zones mentioned bear a definite relation to the bird life. In general, it may be said that the outer, *land zone* is inhabited by the rails, for both nesting and feeding; the ducks, Swamp Sparrow, and often the Maryland Yellow-throat may also nest here. When the slough or kettle-hole is adjacent to timber, as is frequently the case, the Song Sparrow may occupy this outer zone. The middle, *sedge zone* forms excellent concealment for the nests of such birds as the Pied-billed Grebe, Coot, Florida Gallinule, Least Bittern, Red-winged and Yellow-headed Blackbirds, Prairie Marsh Wren, etc. The ducks, coots, grebes, and gallinules frequent the *open water zone* for feeding and play.

The Beaches

The beaches may be divided into two types, which we may call the sand beach, and the mud beach, respectively. The sand beach borders certain portions of the lake, and also certain portions of the Little Sioux River; it varies more or less in width, from two or three feet to a rod or two. There are also several projecting sandspits, all of which, however, are submerged during the high water level which has prevailed in recent years. Two such sandspits in particular have had considerable ornithological interest; these are

Gull Point and the sandspit in Miller's Bay. These sandspits are, when above water, favorite resting places for gulls and terns, and sometimes shorebirds.

The only species known to nest in the sand beach habitat is the Spotted Sandpiper. In 1913 a nest was found on the Miller's Bay sandspit, and also one on the Gull Point sandspit. Green Herons frequently feed along the sand beach; and numerous other species from other habitats occasionally come to the sand beach to feed, e.g., the swallows, the Catbird, the Kingbird, and the Brown Thrasher, and, of course, many others at times.

The mud beach is found along certain portions of the lake shore, especially where there is low ground or a slough in the rear. Some of the kettle-holes are bordered by mud beaches. By the middle of summer the effect of continued evaporation in the shallower sloughs and kettle-holes is shown by the appearance of broad mud beaches, or "mud flats." These form the great feeding grounds for the many species of shorebirds on their fall migration. Fourteen species of shorebirds have been found in this habitat during the season of migration.

The Farm Yard

Under this head we include the immediate environment of human habitation, but not the cultivated fields. We find here a combination of factors which attracts a distinct avian fauna, a sort of mingling of prairie and woodland species. In many cases there is a front yard where the grass is kept short, in which case there is sure to be a pair of nesting Robins nearby. Bushes about the house may harbor a pair of Chipping Sparrows, and there will be several pairs of Western House Wrens hidden away in various nooks. In the orchard may be found one or more pairs of Mourning Doves, a pair of either Baltimore or Orchard Orioles, and possibly a pair of Bluebirds. In the shelterbelt there will be an excellent chance of locating one or two pairs of Arkansas Kingbirds, especially if the shelterbelt is composed of Lombardy Poplars or Cottonwoods. Flickers, Red-headed Woodpeckers, and Warbling Vireos also share the shelterbelt. The common Kingbird will be near at hand, either in the shelterbelt or the orchard, or somewhere. Less frequently the Yellow-throated Vireo, the Wood Pewee, and the Least Flycatcher will be found in the groves of the farm yard. If the shelterbelt contains a thicket and undergrowth there will be Catbirds and Brown Thrashers. Various other species may nest in, or visit, the trees of

the farm yard from time to time; among these may be mentioned the Yellow Warbler, Goldfinch, Bronzed Grackle, Blue Jay, Baltimore Oriole, Hairy and Downy Woodpeckers, and possibly the Rose-breasted Grosbeak.

Around the farm buildings there is always found the Barn Swallow, and more rarely the Cliff Swallow. The Phoebe may also find a suitable shelf for a nest on one of the porches or small buildings.

MIGRATION AND FLOCKING

Confining this discussion to the region involved in this paper, it may be stated that many of the species start in their fall movement by the middle of summer; while others have it fairly completed before the close of summer.

The shore birds as a group are early migrants, the first ones arriving from July 10 to 15. This advance guard includes the Lesser Yellow-legs, Solitary Sandpiper, and Semipalmated Sandpiper. About a week later, by the 20th, the Least and Pectoral Sandpipers and the Semipalmated Plover make their appearance. The height of migration for these species includes the last week in July and the first two weeks of August. Some of these birds are seen in varying numbers throughout August, but the bulk has passed through before the middle of that month.

The Great Blue Heron is also an early arrival, sometimes coming as early as July 12. By the last week of July it is here in large numbers, and continues throughout August, and doubtless also through September. The Ruby-throated Hummingbirds begin to gather, and are probably moving southward, by the latter part of August.

Most of the representatives of the family *Icteridae* make an early departure. The Bobolink has assumed its winter plumage by the first week in August, and is engaged in flocking throughout this month. The movement seems to be at its height by the last week in August. On a trip to Heron Lake, Minnesota, in company with Dr. Arthur F. Smith, on August 23, 1921, I saw flock after flock of Bobolinks in the corn fields, the weedy sloughs, and along the roadsides, and almost everywhere. There were hundreds and hundreds of them, all in winter plumage without exception. I do not know to what extent their migration at this point reaches over into September, if at all.

On this same Heron Lake trip we encountered the hordes of

migrating Yellow-headed Blackbirds. All the way between Spirit Lake (the lake) and Heron Lake we saw enormous mixed flocks of blackbirds, consisting of redwings and yellowheads, but mostly of the latter. These flocks might be guessed at anything from five hundred to a thousand individuals each, possibly more. In the catalogue notes mention is made of another observation of large flocks in 1912. The Yellow-headed Blackbirds begin to flock locally by the middle of July, and by the first of August the males have molted the brilliant head plumage, so that only the throat remains yellow. The local birds leave the sloughs, where they nested, early in August. The birds which come through here in these enormous flocks from the 15th of August on to the last of the month are northern birds. The redwings, for the most part, migrate later on in the fall.

The Bronzed Grackles begin flocking by the first week in July, and continue to move about in flocks during the rest of the summer. It has been impossible to distinguish between local and northern birds. Their migration is not completed until later in the fall; however, on August 25, 1921, a marked flight of these birds occurred along the west shore of West Lake Okoboji, including several flocks estimated to contain about two hundred birds each. These birds seemed to be in all stages of post-nuptial molt; some had a full tail, while others had no tail; and many had the middle rectrices full-grown, while in others they were less than full size. This flight was under way throughout that week in various parts of the lake region, and up to the time these observations were discontinued.

The Cowbirds depart early — they are all gone by July 20. I have never observed that they flock before leaving. During the third week in July the few remaining Cowbirds, mostly males, may be seen flying about restlessly, uttering their peculiar hinge-door squeal, as though nervously seeking their kind. The Orchard Oriole is another member of this family which is gone before the end of July; my latest date is July 25. I have never seen them in flocks.

The *Hirundinidae* are also early migrants, for the most part. The Bank Swallows flock early; the local birds begin flocking by the first week in July, and by the middle of the month large flocks have been formed, which must include local birds from a considerable radius, if they are not all northern birds.⁵ A typical flock is described in

⁵ Dr. Dayton Stoner has done much work in banding Bank Swallows in this region since this paper was prepared, and extensive banding records may give us some accurate information on the formation of these early flocks.

the catalogue notes on this species. The straggle-ends of the movement extend over to the middle of August, but the bulk of this species passes in July. The Rough-winged Swallows leave also in July, very few being seen later than July 25. But I have never seen any large flocks of this species, twenty being the largest number noted together at one time.

The Tree Swallow nests late in June and early July, and there is practically no flocking during the latter month. By the first week in August flocking is under way. On our Heron Lake trip, August 23, 1921, we found many flocks of various sizes, varying from ten or twenty to a hundred or more. Near the upper end of Spirit Lake, and toward evening, of this date, we encountered one enormous flock which we estimated contained no less than a thousand individuals. They were perched on telephone wires, on the wire fences, in the grass of the meadows, and in the corn fields. Only when they all took wing did we have an adequate appreciation of the great size of the flock; our estimate of the number in the flock is very conservative. The smaller flocks which were seen earlier in the afternoon consisted chiefly of adult birds. The large flock just mentioned contained a large proportion of immature birds. I have no records of Tree Swallows in the region beyond the last week of August.

The Barn Swallows flock more or less in August, but I have not observed any distinct movement in that month. It is probable that their migration takes place chiefly in September and October.

The Dickeissel is an early migrant. A few are noted from time to time throughout August, possibly northern birds, but the bulk has gone by the end of July.

During the summer period we get only a glimpse in this region of the warbler migration. As our observations have never begun before the middle of June, we have missed the stragglers of the spring movement. The resident warblers, viz., Yellow Warbler and the Maryland Yellow-throat, leave before the middle of August, except a few stragglers which stay throughout the month.

By the last week in August, the earliest of the warblers make their appearance, but they are not numerous. The Black and White Warbler and the Wilson's Warbler have been seen, and one or two others which have not been identified.

By the last of August the Bluebirds are flying restlessly about, uttering their "pewter" call, and apparently gathering the clan.

PREFACE TO THE CATALOGUE

In the following catalogue of species the scientific names used are those which have been officially adopted by the American Ornithologists' Union in its check-list for 1931, the fourth edition. The vernacular names used are from the same source.

The name is followed by a statement concerning the local status of the species during the summer season. This season is regarded as comprising the months of June, July, and August. It has been thought best to restrict any statement of abundance and any description of plumage, etc., to the period just defined.

The following terms will be used to indicate the author's estimate of the relative abundance of each species in the area considered, viz., "abundant," "common," "fairly common," "uncommon," and "rare." But, of course, it must be remembered that these terms apply only to what has been designated as the "summer season."

It is probably impossible to give any precise definitions of such terms, since the personal judgment is so important a factor. And because of this lack of exactness it is often very difficult to decide which term to apply to a given species. Consequently, these terms can not have very great significance to beginners in bird study. However, as one becomes familiar with the status of a few species, the relative values of these abundance terms begin to assume a more definite meaning, to one's self at least. Since the denotation of these terms is a matter which each one must learn for one's self, it is thought unnecessary and inadvisable to offer any definitions in this elementary treatise.

In addition to this terminology, numbers in fractional form are used as an indication of seasonal regularity of the species. In such a fraction the denominator is constant and indicates the number of seasons. The numerator indicates the number of seasons a given species has been seen out of the whole number. The information conveyed by such a method is precise so far as it goes. It gives some idea of the regularity with which a species visits the region; but it fails, of course, to show the relative numbers of individuals. In other words, it is a species census, rather than an individual census. The abundance terms, together with the figures, should convey a more accurate conception of the status of a species than either method used alone.

The following simple lists are the result of an attempt to enumerate the summer birds of the region according to their relative abundance.

Birds Listed as Rare

Ring-billed Gull	Short-eared Owl
Double-crested Cormorant	Burrowing Owl *
Shoveller	Alder Flycatcher
Wilson's Phalarope	Towhee
Dowitcher	Cedar Waxwing
Stilt Sandpiper *	Prothonotary Warbler
Marbled Godwit	Wilson's Warbler
Willet	Redstart
Prairie Chicken	Tufted Titmouse
Osprey	

Birds Listed as Uncommon

Loon	Crested Flycatcher
Franklin's Gull	Least Flycatcher
Hooded Merganser	Lark Sparrow
Mallard	Chipping Sparrow
Lesser Scaup	Field Sparrow
Bob-white	Cliff Swallow
Cooper's Hawk	Black and White Warbler
Black-billed Cuckoo	Wood Thrush
Ruby-throated Hummingbird	

Birds Listed as Fairly Common

Forster's Tern	Phoebe
Blue-winged Teal	Prairie Horned Lark
Least Bittern	Orchard Oriole
Black-crowned Night Heron	Vesper Sparrow
Green Heron	Grasshopper Sparrow
King Rail	Indigo Bunting
Virginia Rail	Scarlet Tanager
Carolina Rail	Purple Martin
Florida Gallinule	Rough-winged Swallow
Upland Plover	Tree Swallow
Semipalmated Plover	Migrant Shrike
Marsh Hawk	Yellow-throated Vireo
Hairy Woodpecker	Short-billed Marsh Wren
Nighthawk	White-breasted Nuthatch
Chimney Swift	

Birds Listed as Common

Pied-billed Grebe	Bobolink
Black Tern	Cowbird

Great Blue Heron	Yellow-headed Blackbird
Coot	Western Meadowlark
Pectoral Sandpiper	Baltimore Oriole
Least Sandpiper	Bronzed Grackle
Semipalmated Sandpiper	Goldfinch
Lesser Yellow-legs	Song Sparrow
Solitary Sandpiper	Swamp Sparrow
Spotted Sandpiper	Rose-breasted Grosbeak
Killdeer	Dickeissel
Mourning Dove	Red-eyed Vireo
Screech Owl	Warbling Vireo
Yellow-billed Cuckoo	Yellow Warbler
Belted Kingfisher	Maryland Yellow-throat
Downy Woodpecker	Catbird
Red-headed Woodpecker	Brown Thrasher
Northern Flicker	Prairie Marsh Wren
Arkansas Kingbird	Black-capped Chickadee
Wood Pewee	Robin
Blue Jay	Bluebird
Crow	

Birds Listed as Abundant

Kingbird	Bank Swallow
Red-winged Blackbird	Western House Wren
Barn Swallow	

The first paragraph following the statement of abundance is a discussion of the occurrence and distribution of the species within the region. The succeeding paragraphs attempt to give such information as may be of service to visitors to the "Lake Region" who may wish to make some study of the birds. No attempt is made to give a complete description of the birds, but attention is called only to characters which will be of aid in field identification; such characters are called "field marks." Field marks are characters which may be recognized without having the bird in hand. In many cases, such as color, they may not be as accurately defined as the characters which are examined in the laboratory, such as dimensions. They must be exact, however, to the extent that they lead to correct identification.

The matter of size is often important, and one must endeavor to cultivate discrimination in estimating dimensions at some distance. In the following catalogue the approximate length of the bird is given in inches. Length is measured from the tip of the bill to the tip of the tail, when the specimen is laid out straight. The following

table of lengths may assist somewhat in arriving at a judgment by comparison.

	Inches
Hummingbird	3.5
Kinglet	4.5
House Wren	5
English Sparrow	6
Baltimore Oriole	7.5
Robin	10
Bluejay	12
Crow	19
Red-tailed Hawk	21
Golden Eagle	35
Great Blue Heron	48

Too much reliance must not be placed upon one's estimate of size, however; dimensions do vary, and the condition of the plumage, whether sleek or ruffled, may alter appearances, to say nothing of the error in one's judgment. Wherever possible one should study the color of the bird with the light coming from behind the observer.

It must be remembered that this catalogue is based upon actual records, and not upon what may be expected. There are a great many possibilities for additions to the list from the early fall migrants. No attempt has been made to enumerate these possibilities. The list of summer residents is believed to be reasonably complete. A few species, such as the Wood Thrush, the Towhee, and the Redstart, do not occur with the frequency that might be expected. There are numerous environments in the lake region admirably suited to the habits of these woodland birds; and their absence seems to be best explained by the fact that the lake region is surrounded by open prairie country, which would not be readily traversed by these species. It may be remarked that the only river valley reaching the lake region is that of the Little Sioux River. This river is bordered in places by a narrow fringe of trees, which develops here and there into deeper woods. This valley is, however, distant two or three miles from the lakes at the nearest point.

The list is, doubtless, incomplete in the hawks and owls; but such as are omitted must be casual, at best. The Sharp-shinned Hawk has never been seen. On one occasion a small hawk was seen near Lake Okoboji, which, from its small size, must have been either a Pigeon Hawk or a Broad-winged Hawk. We have no record of the Sparrow Hawk within the limits of Dickinson County dur-

ing the summer months. In Osceola County, adjacent on the west, this hawk has been noted as follows: On July 27, 1916, five were seen near Sibley by Dr. A. F. Smith; and in August, 1918, Mr. A. F. Allen saw "about a dozen" between Sibley and the Minnesota state line. We have no summer record for the Red-tailed Hawk in this region.

Mr. Harry C. Tennant had two Long-eared Owls in his collection in 1913, and considered them "scaree" birds around the lakes. A bird was shot in the fall of 1920 whose description fits the Great Horned Owl, but there is no summer record.

The Cardinal has not yet made its way into the lake region, but may be expected. We have never seen, nor heard, the Whippoorwill, although many localities, especially along the Little Sioux River, would seem to be ideal for it. Bell's Vireo has not yet worked this way from the Missouri Valley. No record has been obtained for the Yellow-breasted Chat; but it is doubtful if any typical habitat for this species is to be found in this region.

Altogether, the writer has recorded about 160 species for Dickinson County, for various seasons of the year. (The actual number will undoubtedly run between 250 and 300.) Of these only 116 have been placed in the summer list. A complete list of the birds for all seasons of the year in the lake region is much desired. This will probably have to be compiled through the coöperation of interested bird students who live in this neighborhood.

Family GAVIIDAE: Loons

1. Loon, *Gavia immer* (An uncommon summer visitor. 5/10)

Two Loons were seen on West Lake Okoboji on April 27, 1913. All other records were obtained during the month of July, as follows: July 6, 1911, one on Emerson's Bay; July 4, 1914, three were seen at the north end of West Lake Okoboji; July 22, 1915, two were seen on Emerson's Bay by Mr. Henry J. Kroeger. On July 5, 1919, one of these birds visited the aquatic garden in front of the Lakeside Laboratory. Two juvenals were noted at the head of Lake Okoboji on August 3, 1921.

Length, 32 inches. In this region during the summer no other water bird as large as the Loon is likely to occur. It will be seen in the open lake, and only at considerable distances. When approached, the Loon dives and swims for 25 or 100 yards, or more, without appearing on the surface. The back is black mottled with white, although the white on the back is not distinct at any great distance; the under parts are white. Encircling the black neck there is a white band; and if the observer is able to see this coloring of the neck, together with the diving habit, he may be reasonably sure of identification.

The food of the Loon consists chiefly of fish, but it is claimed that the

species does not often take game fish; and, so far as Iowa is concerned, loons are so scarce that they could do no appreciable damage anyway. Their flesh is not desirable as food. Their only claim for protection rests upon scientific and sentimental grounds.

Family COLYMBIDAE: Grebes

2. Pied-billed Grebe, Hell Diver. *Podilymbus podiceps* (A common summer resident. 10/10)

This grebe nests in many of the larger kettle-holes of the region.

Length, 13.5 inches. It is not likely to be mistaken for a duck, being too small, but at a distance there may be difficulty in distinguishing it from a Coot. The grebe is smaller than a Coot, and has an ivory-white bill marked transversely with a black band (which may not be visible at more than forty or fifty yards, even with a good glass). In swimming the grebe usually holds the head quite stiff and rigid, i.e., without the swinging motion common to the Coot. When alarmed, the grebe dives, and it is a very unusual thing for it to take wing when pursued. (See description of the Coot for contrasting characters.)

The Pied-billed Grebe is seldom seen away from its breeding ground, viz., marshes or kettle-holes which contain an ample growth of *Typha*, *Scirpus*, *Sparganium*, or other concealing vegetation. The nest is molded upon a mass of wet and soggy vegetation.

Not a great deal is known of the food habits of this grebe, and the information we have is based on the study of stomach contents. Their food seems to consist almost wholly of small aquatic animals and insects, the latter constituting about 50 per cent. Their presence and habits are not in any way harmful as far as we know.

Family PHALACROCORACIDAE: Cormorants

3. Double-crested Cormorant. *Phalacrocorax auritus* (A rare summer visitor. 1/10)

Dr. B. H. Bailey included this species in his manuscript list of the summer birds for the season of 1909 in the Okoboji region, but details of the record were not given. I saw one individual on East Okoboji Lake on August 30, 1919.

Length, 30 inches. Only one species of cormorant is known to occur in Iowa. The bird is very large and entirely black. When flushed it flies in a very straight line. It may be distinguished from the Loon by the absence of any white in the plumage, but, like the latter, is likely to be seen only on the larger bodies of water.

Cormorants are probably exclusively fish-eaters. Even if they take game fish along with the others, the number of cormorants in this region is so small that they could have no appreciable effect upon the fish supply. They have no value as food, but should be protected to prevent extermination and for scientific reasons.

Family ARDEIDAE: Herons and Bitterns

4. Great Blue Heron. *Ardea herodias* (A common early fall migrant. 10/10)

This species first appears in Dickinson County from the fourteenth to the

twentieth of July; and then throughout August and September, and later it may be seen about most of the shallow bodies of water, including the Little Sioux River. It is frequently seen early at "The Narrows," on East Okoboji Lake, and at the Green Slough south of Emerson's Bay.

Length, 42 to 50 inches. This is the largest bird that is to be seen about the water during the summer. The wings are dark, slaty blue, appearing almost black at a distance or when the bird is flying. The head and neck are light, white and buff, with black in the crown and some black streaks on the neck. The feathers on the upper half of the leg (tibio-fibula) are chestnut brown in color. Young birds of the year have very little of the adult coloring, but as seen at the distance usually permitted the head and neck are very light—a buff or tawny color; and the body of the bird is not so dark as in the adult. The young birds are the first to arrive, and are usually the only ones seen during July and August. These birds are often referred to as "cranes," but there are no cranes around the lakes during the summer months. The food of the Great Blue Heron consists of frogs, small fish, insects, and even meadow mice (Weed and Dearborn).

5. Green Heron. *Butorides virescens* (A fairly common summer resident. 9/10)

The Green Heron was often seen during the summer months from 1911 to 1913, but since the latter date it has been noted only a few times. In 1911 it nested on the east shore of the Green Slough, where there was a narrow fringe of trees for a short distance. The number of suitable nesting sites for this species is somewhat limited, but there are some wooded tracts along the Little Sioux River which are reasonably well isolated; and the food supply is ample. This bird is sometimes erroneously called the "Little Blue Heron," but there is no authentic record of the latter bird in Dickinson County.

Length, 17 inches. The wings and back have a dark, iridescent green hue, which, at a distance and in certain light, may give the impression of blue. The neck is dark brown, and the head carries a dark green crest. The birds may be seen wading in shallow water, or occasionally perched in trees. The nest is built usually at a height of about 15 feet from the ground in a tree that stands not far from a body of water. The eggs are pale bluish in color. The Green Heron feeds upon such animals as inhabit shallow water, insects, worms, small fish, tadpoles, frogs, etc.

6. Black-crowned Night Heron. *Nycticorax nycticorax naevius* (A fairly common summer resident. 10/10)

The status of this species is very similar to that of *B. virescens*; there seems to have been a marked decrease since 1913. The years 1911, 1912, and 1913 were low water years, and the Green Slough, being shallow, was favorite feeding ground for these birds, as many as forty having been counted there at one time. After about 1913 the lake has been at a higher level, and the Green Slough, having a seepage connection, has also been higher; and the margins of the slough have thus been rendered less attractive as feeding grounds for the herons as well as for the shore birds. Doubtless the same colonies of these herons still exist to the northward, and the local changes have affected only their feeding grounds.

Length, 24 inches. The general appearance is gray; the under parts are white, and the wings are grayish. The back and crown of the head are greenish black, but neither is conspicuous from below when the bird is in flight. The young birds of the year have a buff tone-color streaked with black.

7. Bittern, Thunderpump. *Botaurus lentiginosus* (A common summer resident. 10/10)

This bird may be seen every summer in suitable localities. It is a bird of the marshes, but is often seen flying across the fields with slow beat of wings and long legs projecting behind.

Length, 28 inches. The composite color of the Bittern is yellowish brown. The neck is long, but flexed in flight. The legs are long and yellowish in color. At close range one may see a white throat bordered by a black line which runs laterally down along the neck. This bird may be seen in direct and labored flight over the prairie fields, or standing motionless along the margin of a kettle-hole, or slough, where it feeds and nests.

The food consists chiefly of frogs, crayfish, and small fish, which are seldom taken out of the big lakes. The Bittern occupies a neutral position as to economic value, being neither harmful nor beneficial.

8. Least Bittern. *Ixobrychus exilis* (A fairly common summer resident. 4/10)

The Least Bittern spends the entire time in the sedge zone of the sloughs and kettle-holes, though it may occasionally emerge to feed upon the mud flat bordering the rushes.

The few field records are as follows: One on July 25, 1913, at the Green Slough by Dr. Lynds Jones. One on June 26, 1915, at the same place; one on June 24, 1916, in the Center Lake Slough (sometimes called the Mile-long Slough); and another on the same date at the slough near West Okoboji station, all being seen by the writer. The 1921 records were as follows: On July 31, one was seen in the Canal Slough; on August 3, four were seen in various kettle-holes between West Okoboji and Spirit Lake. The number of individuals seen in 1921 has modified our estimate of the status of the species in this region, which we had previously regarded as uncommon. The abundance of suitable habitats for this species is one of the marked features of the region. The shyness and secretive habits of the bird, together with the usual inaccessibility of its habitat, make an accurate census a matter of some difficulty.

Length, 13 inches. This bird will, in most cases, be recognized by its general appearance and environment, rather than by its bodily field marks. However, the body is small and the neck, when extended, is almost as long as the body. The predominating tone-color is tawny, or yellowish, mixed with brown and black. The bill is yellow. The bird may sometimes be seen perched on the bending stalk of a cattail or sedge, and when flushed it will make a low flight for a short distance, just clearing the vegetation, and drop out of sight.

Family ANATIDAE: Geese and Ducks

9. Mallard, Greenhead. *Anas platyrhynchos* (An uncommon summer resident or visitor. 4/10)

The Mallard has been seen during June, July, and August in different years.

Several nests with eggs have been found, but they may have belonged to semi-domesticated birds.

Length, 23 inches. The male possesses a green, iridescent head, this color extending down the neck as far as a white, circular collar; the breast is deep chestnut. The speculum (on the wing) of both sexes is purplish blue, bordered with white.

10. Blue-winged Teal, *Querquedula discors*. (A fairly common summer resident. 9/10)

This species is frequently seen during June, July, and August, and immature birds are often noted with the adult. A flock of more than two hundred was seen on Rush Lake, in Osceola County, on August 25, 1915; and these birds were probably all locally bred. This is undoubtedly the most common of the breeding ducks.

Length, 16 inches. The wing, in both sexes, is marked by a conspicuous (in flight) patch of light blue color which is located on the lesser and median coverts. The male has a darker head, marked with a white crescentic line in front of the eye.

11. Shoveller, Spoonbill, *Spatula clypeata*. (A rare summer resident. 1/10)

Three Shovellers were seen on the Lower Gar Lake July 19, 1911, and this is the only summer record I can give.

Length, 20 inches. The male has a greenish head, white breast, chestnut flanks, and broad, expansive bill. The female lacks most of the high coloring, but may be recognized by the characteristic bill.

12. Hooded Merganser, *Lophodytes cucullatus*. (An uncommon summer resident. 6/10)

In 1912 this merganser was seen as follows: On June 23 three were seen in the bay in front of the Lakeside Laboratory, and at about the same time another was seen in the canal, so that we felt sure that it was a fourth bird; one was seen again on June 29 and also on July 1. On July 24, 1913, a female was observed by Dr. Lynds Jones on the Green Slough. One was noted by the writer in a kettle-hole near West Okoboji station on July 7, 1914. Two individuals, probably immature, were seen on the Green Slough on July 6, 1916, and another one was reported on July 20. Another individual was found in a kettle-hole near West Okoboji on August 3, 1921. The numbers of these birds have apparently decreased noticeably in the last five or six years, from about 1915 to about 1921. (A single adult was seen in northern Dickinson County on June 30, 1928.)

Length, 17.5 inches. No field marks will be given here, since one can best become acquainted with the bird by observation and by reading descriptions in larger books. The narrow, serrated bill will, however, identify it as a merganser duck, and the Hooded Merganser is the only one which is at all likely to be found here during the summer. The prominent crest with white patch will be sufficient to distinguish the male of the species from any other bird. These birds are always seen, during the summer season, on the sloughs and shallow bodies of water, sometimes with nearly full-grown young. The nest, which we have not found here, is usually placed in a tree cavity or hollow stump. It may

be doubtful whether the birds which breed in our region adhere to this typical behavior.

Authorities seem to be divided as to whether its food consists mainly of animal or vegetable matter; but there seems to be no evidence that it feeds upon any game fish.

Family ACCIPITRIDAE: Hawks and Eagles

13. Cooper's Hawk. *Accipiter cooperi* (An uncommon summer resident. 3/10)

During the summers of 1912, 1915, and 1916, and possibly in the intervening years, a pair of Cooper's Hawks nested in the woods near Elm Crest. After the latter year several cottages were erected in the vicinity, and the hawks did not return.

Length, 16 inches. Cooper's Hawk must be distinguished from the Sharp-shinned Hawk (*Accipiter velox*), although the latter has not been recorded in the lake region during the summer season. *Cooperi* is larger than *velox*, about four inches longer in the male, and four to six inches longer in the female. But the size is variable, and sometimes a female *velox* is about the same length as a male *cooperi*. Forbush compares *cooperi* to the Crow for size, but the hawk has a slightly longer tail. The same authority compares *velox* to the Night-hawk in size, while Sutton makes it a "little larger than a Robin." The color pattern of the adult Cooper's Hawk may be described as slate gray above; under parts whitish heavily barred with rufous; the tail is gray with three or four bars and a white tip. This description applies equally well to the Sharp-shinned Hawk. In the field the observer will have to depend chiefly on the fact of size, and possibly the fact that in *cooperi* the tail is rounded at the tip, while in *velox* it is square.

Both of these hawks have a bad reputation. Out of 133 stomachs of the Cooper's Hawk examined by Dr. Fisher, thirty-four contained remains of poultry or game birds. It does not seem to feed to any great extent upon insects. It is fortunate that the species is not more abundant.

14. Marsh Hawk. *Circus hudsonius* (A fairly common summer resident. 9/10)

This harrier is frequently seen skimming over the prairies in search of mice and gophers and other rodents. It is the only common hawk of this region.

Length, 19 inches. This is a medium-sized hawk, which may usually be safely identified by its conspicuous white rump. The male is bluish gray, while the female and young are reddish brown in color. Its habit of flying over the fields at low elevation is also characteristic. The Red-tailed Hawk in certain plumages also shows a white rump, but the larger size, red tail, and habit of flying at higher elevation will usually distinguish this bird.

Every farmer should learn to distinguish the different hawks and owls. The Marsh Hawk is the farmer's friend because its food consists of animals which are injurious to agriculture. Of the few hawks found in this region the Marsh Hawk is the most beneficial. On examining the stomachs of 124 Marsh Hawks, Dr. A. K. Fisher found the remains of poultry or game birds in only seven stomachs. On the other hand their food consists "largely of small rodents, such as meadow mice, half-grown squirrels, rabbits, and ground squirrels." One stomach, which was opened by the writer, contained seven young mice.

In Nebraska, Aughey found many locusts and other insects in the stomachs of six Marsh Hawks.

15. Osprey. Fish Hawk. *Pandion haliaëtus carolinensis* (A rare summer visitor. 2/10)

Dr. Lynds Jones saw an Osprey on East Okoboji Lake in 1913. The writer saw one in flight over Miller's Bay on July 3, 1916; Mr. Noel J. Williams saw one on East Okoboji Lake on the 30th of the same month. Mr. Williams said that he had seen one at other times around the East Lakes.

Length, 23 inches. The back and wings are very dark; the under parts are white and the head is white, marked more or less with black. There is no other hawk that can be very well confounded with the Osprey. Out of twelve specimens examined by Dr. Fisher, nothing but fish was found in the stomachs; but the number of these birds around the lakes is so small that the fish supply can not be affected in the least. It is very doubtful if these birds would come close enough to habitation to disturb the fish in the hatchery. On the other hand, their majestic flight adds a charm to the beauty of the lake environment.

Family TETRAONIDAE: Grouse, Partridges, etc.

16. Prairie Chicken. Pinnated Grouse. *Tympanuchus cupido*

I have seen but one Prairie Chicken in ten years of summer field work, on August 5, 1913, near the town of Montgomery. However, Mr. Frank Harker told me of seeing a small flock in his fields on August 24, 1912. Professor B. Shimek saw one about a mile west of the Laboratory on June 20, 1918. Mr. Noel J. Williams saw an adult with a flock of seven young ones in Center Grove Township on July 23, 1920.

The Pinnated Grouse formerly nested in great abundance throughout the area here treated, but has been forced to give way with the advance of civilization. The best we can now hope for will be the nesting of an occasional pair in certain favorable spots; and the observation of Mr. Williams, noted above, encourages us in this hope. It is unlikely that an open season for shooting these birds will ever be declared again in Iowa, but even so the odds are against them. Perhaps it should be again stated that the preceding remarks deal only with the summer status of the Prairie Chicken. It is well known that it comes down from the north in larger numbers during the fall and winter; but how these numbers compare with former abundance I can not say.

Family PERDICIDAE: Partridges and Quails

17. Bob-white. Quail. *Colinus virginianus* (An uncommon resident. 4/10)

One individual was seen in 1911, none in 1912, two in 1913, and one was reported in 1916. The Bob-white's call was heard several times in June, 1921, near the Laboratory grounds. There is more shelter and cover in the immediate vicinity of the lakes than elsewhere in the county, except along the rivers; and if the Bob-whites are at all numerous in the region it is fair to assume that they would be present in these sheltered areas. To what extent this species may "come back" as a result of closed season laws remains to be seen. The Bob-white may be recognized by its call; but the Western Meadowlark often gives a whistle which one might easily confuse with the second syllable of the Bob-white's call.

Little needs to be said of the economic value of the Bob-white in a community. So many states have recognized this by giving protection to these birds that the public is pretty well informed. It will probably take a very long period of protection to establish the Bob-white again in northern Iowa. An occasional severe winter will cancel much of the year's gain. Whether the wooded shores of the lakes now contain enough undergrowth and brush piles or other shelter for these birds in severe weather is a question. However, no harm can arise by giving them every possible chance to recuperate. Every lover of nature will prefer these native birds to the imported Ring-necked Pheasants.

Family RALLIDAE: Rails, Coots, and Gallinules

18. King Rail. *Rallus elegans* (A fairly common summer resident. 5/10)

The few records of this species are as follows: On July 19, 1911, two of these rails were seen in a small kettle-hole lying close to the east shore of Lower Gar Lake. On August 12, 1915, Professor A. F. Ewers and the writer flushed a King Rail out of a kettle-hole a few miles west of the Laboratory; as the bird came out onto the road, we took after it as fast as we could, but the bird, instead of slipping into the tall sedges on either side of the road, ran in the road for nearly a hundred yards before it was compelled to take flight. We have since reflected on the curious behavior of the bird. Another individual was seen in one of the kettle-holes west of the Laboratory on August 5, 1916. On July 23, 1917, Mr. A. R. Abel saw one in the Green Slough. In August, 1921, five individuals were counted in different sloughs near West Okoboji; and two were noted in sloughs on the east and north sides of Spirit Lake.

Length, 18 inches. The breast is dark chestnut in color; the back and wings are brownish, mottled with black. The under parts posterior to the legs are conspicuously marked with black and white bars. The throat is white. The bill is rather long, and reddish in color. The tail is short and abruptly pointed. These birds are seen only in or near the dense vegetation along the margins of marshes, and are most proficient in eluding observation. They are largely insectivorous, and Aughey found locusts in the stomachs of those which he examined. Some seeds and other vegetation were also found in the stomachs.

19. Virginia Rail. *Rallus limicola* (A fairly common summer resident. 4/10)

In the summer of 1912 (it might possibly have been 1913, since the notes were not quite clear) the writer found a nearly whole rail's egg along the east shore of the Green Slough. Several years later it was sent to the United States Biological Survey, at Washington, and was determined, by Dr. H. C. Oberholser, as belonging to *R. virginianus*. On June 25, 1917, one of these birds was flushed near the bridge crossing the canal at Miller's Bay; and another one was flushed in the same locality on June 24, 1918. Three adults and one fledgling were observed on August 3, 1921, in the sloughs at West Okoboji.

Length, 9.5 inches. The Virginia Rail is very similar to the King Rail in color pattern; while there are slight differences in color, they are not such as would be of value to the novice. There is so great a difference in size between the two birds that field identification can be readily based on this character.

Their food consists mainly of insects, snails, and other animal matter; seeds are eaten to a small extent.

20. Carolina Rail, Sora. *Porzana carolina* (A fairly common summer resident, 4/10)

Two individuals were seen at West Okoboji on August 3, 1912. On July 23, 1913, one was seen in the vicinity of Emerson's Bay by Dr. Lynds Jones and Mr. L. N. Gabrielson. The writer saw another one at the south end of the Green Slough on August 28, 1919. Two individuals were seen in early August, 1921, in sloughs near West Okoboji. Notwithstanding the great number of sloughs and marshes in this region, and the considerable amount of field work which has been done around them, we have made but few records of the rails. This apparent scarcity is probably due to their very seclusive habits.

Length, 8.5 inches. The Sora has a relatively short, thick, yellow bill, which usually shows in marked contrast with the black throat and lores. The head and neck are grayish, except for the black just mentioned, while the back has a general olive tone mottled more or less with black. The under parts are whitish, crossed transversely with rather heavy, black bars, as in all the rails. The Sora and the Virginia Rails are nearly the same size, but may be readily distinguished by the general tone-color and by the strikingly different bills.

The Sora seems to be much more vegetarian in diet than the other rails which we have, and is fond of various plant seeds, such as wild rice.

21. Florida Gallinule. *Gallinula chloropus cachiinnans* (An uncommon summer resident, 5/10)

The following field records are to be reported: On July 24, 1913, Dr. Lynds Jones saw one on the Green Slough. The writer saw one in the same locality on August 14, 1915. In 1916 adults and young were seen in the slough south of Center Lake — sometimes called "Mile-long Slough" (June 24); in one of the kettle-holes west of the Laboratory (July 31); and at the Green Slough (August 7). In 1917 adults were seen in the Green Slough and in the Canal Slough, south of Emerson's Bay. In 1921 an adult was seen at West Okoboji (June 23); a young one was seen in the same locality on August 3; and on August 23 seven young ones were seen a few miles north of Spirit Lake, in Minnesota. Only the larger sloughs seem to be chosen by these birds.

Length, 13 inches. This bird is nearly the same size as the Pied-billed Grebe, and a trifle smaller than the Coot. Occasionally it is seen swimming in the open water, but much more of its time is spent in skulking among the sedges and rushes. The body is dark, almost black at a distance, but the undertail coverts are white, often quite conspicuous; white markings on the flanks may not always be so noticeable. The diagnostic mark, however, is a bright, scarlet plate extending from the bill up onto the forehead; the basal portion of the bill is also of the same color.

The food of these birds is chiefly vegetable matter.

22. American Coot, Mudhen. *Fulica americana* (A common summer resident, 10/10)

The Coot breeds in considerable numbers in the sloughs and larger kettle-holes of the region, and was noted in unusual numbers in 1916. In the latter part of August flocks of several hundred may be seen, and later in the season vast numbers collect on the lakes preparatory to migration.

Length, 15 inches. The plumage of the Coot is wholly blackish, except that

the undertail coverts and the anterior wing margins are white. The bill is chalky white in color. The toes are lobed and covered with bright green skin. The Coot frequents the open water more than does the Florida Gallinule. In swimming, the Coot's head and neck move with a peculiar oscillatory rhythm which is not characteristic of the Pied-billed Grebe, and the Coot does not dive to escape pursuit as does the grebe.

The Coot is more or less omnivorous, and is able to make use of a wide variety of plant and animal material in its diet. So far as known at present, it is neutral in economic value.

Family CHARADRIIDAE: Plovers

23. Semipalmated Plover, *Charadrius semipalmatus* (An uncommon early fall migrant. 4/10)

This plover has been observed during the latter part of July and in August, but never in large numbers.

Length, 7 inches. The upper parts are brownish gray, tending to olive; the under parts are white; there is only one black band across the white breast, and nearly encircling the neck. The forehead is white with a narrow black band both above and below it. This bird is found only along the beaches and mud flats.

24. Killdeer, *Oryzochus vociferus* (A common summer resident. 10/10)

This is one of the most common species of the prairie region.

Length, 10 inches. The upper parts are grayish brown; the rump is rufous; the under parts are white; and there are two black bands across the white breast. The identity of the Killdeer is never in doubt when he utters his shrill call, "killdee, killdee," usually in tones of alarm, but perhaps also as a recognition call note during migration. The Killdeer frequents the meadows and beaches usually, but may be found almost anywhere except in the woods. It is a great consumer of insects, and, with all other shore birds, deserves protection.

25. Golden Plover, *Pluvialis dominica* (A rare early fall migrant)

I have not seen this bird in this region, but Professor B. Shimek has reported that he saw a flock of about twenty at the north end of Spirit Lake on August 5, 1913. Mr. Frank Harker, who has farmed on the west shore of Lake Okoboji for many years, and who is familiar with these birds as "prairie pigeons," says that they used to come through in October "by the thousands." He says that they were even more abundant in the spring, and he has observed their partiality for burned-over areas.

Length, 10.5 inches. The Golden Plover is very much like the Black-bellied Plover in size and color pattern, especially in the winter plumage. In breeding plumage these birds have a dark back spotted with golden yellow; the crown is also dark, as is the tail. The throat, breast, belly, and undertail coverts are black. (In the Black-bellied Plover the crown and back are gray; the tail is white barred with black. The throat, breast and belly are black. Undertail coverts are white. In both birds the white of the forehead runs caudad over the eye, and down along the neck. In both birds also the short, black, plover bill may be distinguished from the long sandpiper bill.) In the winter plumage the birds are so different that some care must be used in identifying them.

Family SCOLOPACIDAE: Sandpipers and Snipes

26. Long-billed Curlew. *Numenius americanus*. (A rare summer visitor, if present.)

This species is included in the list wholly on the basis of a specimen reported by Oberholser,⁶ which was taken in Dickinson County, Iowa, on June 10, 1881. But I have a letter (dated August 30, 1917) from Franklin W. Calkins, an early resident of Clay County, Iowa, which states that the Long-billed Curlew "nested with us from 1865 to 1875, but was never numerous."

27. Upland Plover. Bartramian Sandpiper. *Bartramia longicauda* (A fairly common summer resident. 9/10)

During the years 1911, 1912, and 1913 this species was frequently seen on the prairie uplands in the vicinity of the Lake. Since the latter year there seems to have been a marked decrease in their numbers; and in places where they used to be seen regularly they are now absent. In 1921, however, at least five pairs were located in the vicinity of Lake Okoboji, and this did not involve a thorough search.

Length, 12 inches. No other bird is likely to be confused with this one on the prairie. Its large size, with rather long neck, and dark color, together with its characteristic behavior, makes identification easy. It is very alert, and usually flies before it has been observed. It then flies along near the intruder with a peculiar, hovering flight, meanwhile uttering a loud, tremulous alarm call. I have been followed for nearly a mile by one of these birds; when it got some distance ahead it would alight momentarily on a telegraph pole or fence post. Always when alighting the wings would be elevated high over the back, until they seemed to come in contact, and held there for just an instant before being closed. This peculiar habit seems to be invariable.

At rare intervals the Upland Plover utters a prolonged sonorous whistle, which many would not, at first, associate with any bird. It is possible that this song may be more common earlier in the season, for my observations have always begun after the nesting season was over. Professor A. P. Larrabee, of Yankton College, describes this as "an attractive call, rising abruptly from the opening note to about an octave above, and then sliding down gradually in a long, drawn-out, melodious whistle."

The Upland Plover is a very valuable species because of its insect-eating habit. It was known to feed largely on grasshoppers during the "grasshopper years" in Nebraska. Like the Bob-white, it is harmless and beneficial, and should be allowed to increase.

28. Spotted Sandpiper. Teeter-tail. *Actitis macularia* (A common summer resident. 10/10)

Dr. Arthur F. Smith in 1913 made some observations on two broods of Spotted Sandpipers which nested on Gull Point and Miller's Bay Sandspit, respectively.⁷

Length, 7.5 inches. Prior to the first week in July, any shore bird observed along the sandy or rocky beaches is likely to be a Spotted Sandpiper. After

⁶ Oberholser, Harry C. Notes on the subspecies of *Numenius americanus* Bechstein. Auk 35: 190. 1918.

⁷ Smith, Arthur F. Notes on the Spotted Sandpiper. Wilson Bull. 26: 81-86. 1914.

that date others come in from northern points. The Spotted Sandpiper has the habit of constantly teetering its tail, which has given rise to one or two vernacular names. The feathers of the back have an olive hue with transverse black bars, which may be seen in the field if one is close and uses a good glass. The under parts are white, marked on the breast and sides with conspicuous black spots; these spots are lacking, however, in juvenile birds. When the wing is extended, as in flight, a long, transverse, white bar may be seen across it. This sandpiper sometimes nests as late as the first week of July.

29. Solitary Sandpiper. *Tringa solitaria* (A common early fall migrant. 6/10)

This species arrives about the middle of July, on the average, though in 1911 it was observed on July 10. It is never observed in numbers that could be called flocks.

Length, 8.5 inches. This bird has a distinct olive tinge on the back. The belly and breast are white; the latter may be somewhat streaked with dark. The middle tail feathers are dark, the outer ones are white, *distinctly barred with black*. The white ring around the eye may be observed at close range. It is often seen among other shore birds, and often alone.

30. Willet. *Catoptrophorus semipalmatus* (A rare fall migrant. 1/10)

At dusk on the evening of July 27, 1911, the writer's attention was attracted by a loud, flute-like bird call from the bay in front of the Laboratory. It was a strange and weird call. By taking a boat we located the birds on the tip of the sandspit, chiefly by following the sound, for the birds were invisible against the sand until we came within twenty yards. There were three of the birds, and when first seen they were in an attitude of repose with the neck flexed in a sigmoid fashion. It is, of course, impossible to say whether they belonged to the subspecies *semipalmatus* or *inornatus*.

Length, 16 inches. The Willet is one of the largest of the shore birds. The body is predominantly gray, with black outer wing feathers. Both the bill and legs are long and black.

31. Lesser Yellow-legs. *Totanus flavipes* (A common early fall migrant. 7/10)

The Yellow-legs arrives early in July, often during the second week, and is then seen throughout July and August. It is usually the first of the shore birds to arrive in the fall migration. Although recorded here in only seven out of ten summers, it is, nevertheless, a common and regular migrant.

Length, 10.5 inches. The body color is dark gray above; the rump is white, and the tail feathers are indistinctly barred with black. The under parts are whitish, faintly mottled with black. The legs are very long and bright yellow in color. It is found along the beaches and mud flats, and occasionally in the meadows. The Greater Yellow-legs, with a length of about 14 inches, has not been noted, though it probably occurs.

32. Pectoral Sandpiper. Grass Snipe. *Pisobia melanotos* (A common early fall migrant. 8/10)

This species was seen in considerable numbers during the seasons of 1911, 1913, and 1916, and sparingly in other years; a fairly good flight appeared, however, in 1921. This species usually appears by the middle of July, being one of the first of the migrating shore birds to arrive, and is seen throughout August.

Length, 9 inches. The Pectoral Sandpiper is grayish buff, mottled with black. The under parts are whitish; the breast is buff colored, heavily streaked with black, and both of these markings end abruptly, making a sharp contrast with the white belly. These birds frequent the sandy beaches and mud flats, and are also occasionally seen in the grassy fields.

33. Least Sandpiper. *Plisobia minutilla* (A fairly common early fall migrant. 6/10)

The Least Sandpiper was frequently seen during July and August of 1911, 1912, and 1913, but sparingly since. It is believed that the large numbers of shore birds in these years were due to the low water, which made suitable feeding beaches more numerous.

Length, 6 inches. This one is about the smallest of the shore birds, but is distinguished from the Semipalmated Sandpiper with difficulty. The latter is more grayish and has almost no markings on the breast. The Least Sandpiper is darker, the back being marked with black and brown, and the breast is more or less streaked with these colors. Yet there are variations that prevent certain identification by these color characteristics in all cases.

34. Dowitcher. *Lymnodymus griseus griseus* (A rare early fall migrant. 1/10)

On July 20, 1913, one individual was seen at the Green Slough among hundreds of other sandpipers. Three days later a specimen was collected at the same spot—probably the same individual. This is the only record known for the region. At the time some doubt was entertained as to whether this specimen represented the subspecies *griseus* or *scolopaceus*; but Dr. H. C. Oberholser kindly determined it as here listed.

Length, 10.5 inches. This snipe possesses the usual long, black bill— from 2 to 2½ inches. The under parts of the body are reddish brown; the upper parts are grayish or darker, except the rump and tail which are whitish.

35. Stilt Sandpiper. *Micropalama himantopus* (A rare early fall migrant. 3/10)

On July 12, 1912, two were seen in a kettle-hole at West Okoboji. Three were seen on July 21, 1913, at the Green Slough, and one of these was taken. Another one was seen in the slough north of the "sandspit" in Miller's Bay on July 30, 1921. No other records have been obtained.

Length, 8.5 inches. The back is dark—mixed black and buff; the under parts are whitish, heavily barred with black. The crown of the head and a patch behind the eye are reddish.

36. Semipalmated Sandpiper. *Ereunetes pusillus* (A fairly common early fall migrant. 4/10)

The Semipalmated Sandpiper arrives with the other shore birds about the middle of July, and remains throughout August. My actual records show about the same status for this and the Least Sandpiper; nevertheless, when one identifies half a dozen birds out of a flock of several hundred, one can only surmise what the rest of the flock were. My impression from field study is that the Semipalmated Sandpiper is fairly common among the flocks of shore birds that come through this region.

Length, 6.25 inches. This bird takes its name from the fact that the toes

are webbed part way to the tips, but this is hardly a field mark since it would so seldom be observed in the field. The comparison of this species with the Least Sandpiper, in the discussion of the latter species, need not be here repeated.

37. Marbled Godwit. *Limosa fedoa* (A rare early fall migrant. 1/10)

The only record of this species was obtained in 1913 at the Green Slough, south of Emerson's Bay. On July 21 one Marbled Godwit was seen, and on July 23 a specimen was taken — probably the one seen earlier.

Length, 18 inches. The Godwits are rather large birds having a long, slightly upcurved bill, the latter having a length of four inches. The general plumage color is described as ochraceous buff, and at a distance appears to be almost a dark pink. There are no special color markings that would serve as good field marks, and there is no white rump such as occurs in the Hudsonian Godwit.

Family PHALAROPODIDAE: Phalaropes

38. Wilson's Phalarope. *Steganopus tricolor* (A rare early fall migrant. 1/10)

The only certain observation of this species was made on July 30, 1921, along the north shore of Miller's Bay, and was identified by Professor A. P. Larabee and the writer. Late in July, 1913, a phalarope, probably of this species, was seen at the Green Slough, but the distance was too great for complete identification.

Length, 9 inches. This is the largest of the three phalaropes, and the only one which we have found in this region during the summer season. Few birds compare with the phalarope in grace and beauty of movement. It feeds either while wading or while swimming. When feeding on the water the bird practices a rotary swimming movement which is peculiar to this family. Sometimes, while wading, this trait will be manifested in a nervous turning from side to side, alternately, in feeding. If this habit can be surely identified the bird may be recognized as a phalarope; if the bill is long, over an inch, the bird is *S. tricolor*, since the other two phalaropes have bills under an inch in length. The female bird is marked by a distinct black line which runs through the eye and widens into a broader black band on the side of the head and neck, shading into a rich chestnut brown color. The male bird lacks this coloring, and is grayish above and whitish below.

Family LARIDAE: Gulls and Terns

39. Ring-billed Gull. *Larus delawarensis* (A migrant and rare summer visitor. 3/10)

On July 21, 1911, three gulls flew in and alighted on the sandspit in front of the Lakeside Laboratory. We were able to approach close enough to see the black ring on the bill of the larger one; the two smaller ones were probably immature.

Length, 18.5 inches. The Ring-billed Gull is quite similar to the Herring Gull in the adult stages, and some care will be necessary to distinguish one from the other at any considerable distance. The diagnostic characters may best be obtained from other sources; but if one is close enough to see the dark ring around the bill, the identification may be accepted. The gulls, except the Franklin's, are seen only about the larger bodies of water.

The gull is somewhat omnivorous, its diet including fish, mollusks, crayfish, and insects. The stomach of one bird examined by Professor Aughey contained forty locusts (grasshoppers).

40. Franklin's Gull. *Larus pipixcan* (An uncommon summer visitor, not known to breed, 5/10)

In late summer and fall these birds may, at times, be seen over the lakes in flocks of from ten to twenty.

Length, 15 inches. This is a medium-sized gull, white below and bluish gray above, with a black head. The longest primaries are tipped with black, and there is a small white spot in the black area of each black-tipped feather; this character distinguishes *franklini* from *philadelphia*, which is otherwise very similar.

This is the gull that follows the farmer as he plows in the spring, picking up the grubs and larvae as they are turned in the furrow. These birds, which migrate in large flocks in the spring, must consume great quantities of harmful insects.

41. Forster's Tern. *Sterna forsteri* (A fairly common summer visitor, 10/10)

Specimens of this tern have not been examined by the writer. R. M. Anderson has, however, named *forsteri* as the species to be found in this region.⁸ Under date of November 4, 1916, Professor B. H. Bailey, of Coe College, wrote me that he had taken a specimen of Forster's Tern at "Big Spirit Lake" on July 30, 1902, and that the skin was deposited as No. 423 in the Coe College Museum. Under date of August 7, 1929, Mr. W. F. Kubichek, Curator of The Bert Heald Bailey Museum, at Coe College, states that this specimen is still in the Museum, and verifies the identification.

This species is sometimes found in June (though not since 1914), and becomes more or less common during July. The largest numbers were seen in 1912 and 1913. Since then there has been a marked decrease in numbers. The observations made on the Okoboji lakes would lead to the supposition that these birds breed a few miles to the northward, possibly at Loon Lake, Heron Lake, or some of the many other small lakes of southern Minnesota, and that by July they begin to spread out from the nesting area. On July 8, 1921, Mr. A. F. Allen saw one adult feeding three young ones over the waters of Miller's Bay; this is the best evidence thus far of the breeding of this species nearby.

In 1921 these birds were seen over Lake Okoboji occasionally during July, but not later. Six were seen at Center Lake on July 1, and several were seen at Spirit Lake during August. Probably in recent years settlement has compelled the birds to go farther north to breed, so they do not reach Okoboji as early as formerly. If this is not true there must be an actual decrease in the number of birds. The largest number which has been seen at one time was thirty, July 10, 1912. It is a peculiar fact, however, that the larger gulls and terns seem to prefer Spirit Lake to Lake Okoboji.

Length, 15 inches. The body and wings appear white as the bird is seen in

⁸ *S. forsteri* is accepted as the breeding form in the close vicinity of the Okoboji region by the following authorities: Peabody, A Tern study, Osprey 1: 1-3, 1896. Roberts, An account of the nesting habits of Franklin's Rosy Gull, Auk 17: 281, 1900. Bent, Life histories of American gulls and terns, U. S. Nat. Mus. Bull. 113: 229-236, 1921.

light. The crown of the head is black. The bill is dusky tinged. No one will be surprised that the Chestnut Tree Sparrow, as shown, still has a right, but it would be impossible to distinguish the two species without seeing the specimens in hand. If the Chestnut Tree Sparrow at all it will probably be at the close of the breeding season, as a rule. Parker's Tree Sparrow with the same bill as that of the Chestnut Tree Sparrow, but with a more contrasting color with the Chestnut Tree Sparrow. (I have never observed the Chestnut Tree Sparrow in the field.)

41. Black Tree Sparrow *Spizella monticola* (Linn.) (Common eastern species, 1870-1875)

Length, 10 inches. Its other head is likely to be confused with the one. While the body is small, the long, slender wings give the appearance of greater size. The body is black, except that the belly is white; the wings are black, except the inner margin which is white. The young birds are distinctly different in plumage, but will be easily known by their association with the old birds.

The Black Tree Sparrow is the commonest of the species and always adheres to the habit of building its nest in the shelter and large hollow of water. Like the common large birds by lake and pond, over the hills of our great, beautiful country, it is the king. I have never observed this species feeding in such a way as to suggest the feeding of sparrows, with one possible exception. As a general statement it may be said that the Black Tree Sparrow and the water is much of food, which it picks up by a graceful dip in the surface. During the winter, many times I have watched these birds feeding. I have seen only one individual plunge into the water. On one occasion the water had exposed the old gravel bank, so that I had no reason to believe it was accidental, but the plunge was from a very short height, and only the head went under the water. It did not give before diving, as do the Parker's and Chestnut Tree Sparrows.

Family CUNILINIDAE: Three

42. Mourning Dove *Spizella monticola* (Linn.) (Common eastern species, 1870-1875)

I can not say whether the Mourning Dove is the locality in the eastern part of the United States, or the Western Mourning Dove (Linn.) is the locality. My impression is that the Mourning Dove is a common species throughout the eastern part of the United States, but rarely from the hills of North Dakota and Minnesota. It is enough lighter in color than the birds of North Dakota and Minnesota to have the distinction as to reference for their distribution.

The Mourning Dove is adopted as an open breeding season in many states of the north and in Minnesota. In 1870 a bill was introduced in the Iowa Legislature which included an open season on this bird. It is difficult to get from the Mourning Dove as a game bird. It is tame and unaggressive, easily approached and easily shot. It is not a graceful hunter, relying only the young in a forest. Besides this, the Mourning Dove is not only tame, but it is a reliable ally of man in doing the work of wood and nesting. We can not believe that such specimens will be shot this bird, but there seems to be others who do, and some will seek to be on their guard to protect it in Iowa.

Family CUCULIDAE: Cuckoos

44. Yellow-billed Cuckoo, *Coccyzus americanus* (A fairly common summer resident, 9/10)

Length, 12 inches. The upper parts are brownish gray; the under parts are pure white. The lower mandible is yellow. The wings are distinctly rufous, or cinnamon, in color. The dark feathers of the tail are broadly tipped with white in such a way that the under side of the tail, when closed, presents a succession of broad, white spots. These three characters serve to distinguish this species from the next.

The food habits of the two cuckoos are alike. According to Weed and Dearborn only 1 stomach out of 155 contained any fruit. They are chiefly insectivorous, and will greedily feed on a number of injurious insects which most birds will not touch. They seem especially fond of the various hairy caterpillars. One cuckoo's stomach was found to contain 251 tent caterpillars, while another one contained 325 larvae of the fall webworm, both of which are very destructive in orchards.

45. Black-billed Cuckoo, *Coccyzus erythrophthalmus* (An uncommon summer resident, 3/10)

A nest containing two eggs was found near Emerson's Bay in June, 1911; and an adult bird was seen in 1912. Professor Charles R. Keyes found a dead Black-billed Cuckoo between Milford and the Lake on July 21, 1921. Many times we would see or hear a cuckoo without being able to be sure which of the two species it was; but, roughly speaking, I would say that the two cuckoos, viz., *americanus* and *erythrophthalmus*, occur in this region in about the proportion of twenty-five to one.

Length, nearly 12 inches. The Black-billed Cuckoo is of uniform grayish-brown color on both back and wings. The lower mandible is black. The tail feathers are of the same color as the back, and are narrowly tipped with white. The food habits are the same as in the Yellow-billed.

Family STRIGIDAE: Horned Owls

The following key may be of some help in identifying the various owls in the field. Not all of the owls included in the key are listed as summer birds of this region. The species marked with an asterisk, if present at all, are winter visitors only.

- A. With ear-tufts, or "horns":
- a. Over 12 inches in length:
 - b. Distinct ear-tufts, an inch or more long:
 - c. Small size, 15 inches; under parts streaked — Long-eared Owl.
 - cc. Large size, 23 inches; under parts barred — Great Horned Owl.
 - bb. Indistinct ear-tufts, half inch or less — Short-eared Owl.
 - aa. Under 12 inches in length — Screech Owl.
- B. Without ear-tufts, or "horns":
- a. Over 15 inches in length:
 - b. Distinctly tan and buff color; 18 inches long — Barn Owl.
 - bb. Distinctly white, with black spots; 25 inches long — Snowy Owl.*

bbb. Dark brown; throat barred, belly streaked; 20 inches long — Barred Owl.

aa. Under 15 inches in length:

b. Legs very long and nearly bare; 9 inches long — Burrowing Owl.

bb. Legs short and feathered:

c. Small size, 8 inches; under parts streaked only — Saw-whet Owl.*

cc. Larger size, 10 inches; throat barred, belly streaked — Richardson's Owl.*

46. Screech Owl. *Otus asio* (A common summer resident. 10/10)

This owl is heard at night along many parts of the lake shore. It is not so often seen, because of its nocturnal habits.

Length, 9.5 inches. The Screech Owl is distinguished from other owls by its small size and by the presence of relatively long and conspicuous ear-tufts. It occurs in two color phases, the gray and the red. In the former the general color is brownish gray, with whitish under parts heavily marked with black. In the red phase the predominant color is reddish brown, the whitish under parts being marked with red and black. In Dickinson County the gray phase occurs most commonly, although the red phase has been seen once or twice. This owl is easily recognized at night by its peculiar tremulous call, suggesting often the neighing of a horse.

The Screech Owl is a valuable mouse catcher, and as such is worth several cats. These birds also eat large quantities of insects, varied with small mammals (rodents mostly), fish, cray-fish, frogs, and small birds. The habit of occasionally destroying song birds is against the Screech Owl, especially when he takes up his abode on the premises of some one who is endeavoring to attract smaller, native birds. A great deal has been written in recent years against the Screech Owl, and it is a little difficult to say at this time whether the balance is for him or against him.

47. Western Burrowing Owl. *Speotyto cunicularia hypugaea* (A rare summer resident. 1/10)

On July 11, 1921, Professor Charles R. Keyes, of Cornell College, found a family of these owls in the pasture just north of the Laboratory. Eight birds were counted, the young of which seemed to belong to one brood, although at least three burrows were in use. The number and condition of the burrows indicated that the owls had inhabited the same locality for at least one, and possibly two, previous years. These same burrows were occupied in the following summer, 1922, and possibly also later. Charles K. Salisbury reported the finding of a Burrowing Owl a few miles southwest of Lake Park in the early fall of 1895 (*See Anderson's "Birds of Iowa,"* 268). Professor B. Shimek informs me by letter that he saw a Burrowing Owl on the west slope of Ocheyedan Mound, in adjacent Osceola County, on September 14, 1921.

Length, 10 inches. Their general color is brown, mottled with whitish and some black. The tarsi (legs) are quite long, and are unfeathered. The young birds are similar, but there are no streaks or markings on the buff-colored breast and belly. These owls prefer to inhabit short-grass meadows and pas-

tures. They spend much time sitting by the opening of the burrow, but often perch on a fence post or telephone pole; they are probably never seen in trees.

Their food consists mostly of insects, and especially grasshoppers (locusts); but mice and other small rodents are also taken by them. While watching this colony near the Laboratory one evening, the writer saw one of the old birds flying toward the burrow with a mouse in its talons.

48. Short-eared Owl. *Asio flammeus* (An uncommon summer resident. 3/10)

A nest containing two fledglings was found on July 5, 1913, in the fields a few miles north of the Laboratory. These two young birds were kept for some time in captivity, and an account of their habits and behavior was published by Miss Helen Giehm, a student at the Laboratory, in the *Sioux City Journal* of January 4, 1914. On July 11, 1916, several students at the Laboratory saw an adult flying near the Laboratory. On another occasion I flushed one from the marsh near the Canal, without putting down the date. The late Dr. B. H. Bailey⁹ also charts this species as occurring and breeding in Dickinson County.

Length, 15.5 inches. The body is dark brownish, streaked on under parts. A pair of short ear-tufts (about half an inch long) may be visible at short range. This bird is found in the open fields near marshes, and nests upon the ground. It feeds upon field mice, gophers, moles, and many kinds of insects, and is regarded as a very useful bird.

Family CAPRIMULGIDAE: Goatsuckers

49. Nighthawk. Bullbat. *Chordeiles minor* (A fairly common summer resident. 9/10)

No specimens were taken during these studies, but according to Oberholser¹⁰ the subspecies which occurs "east to Dickinson County, northwestern Iowa" is *sennetti*. My own field observations would lead me to think that the nighthawks which breed in Dickinson County are too dark for *sennetti*, but this should be determined by taking specimens.

Length, 10 inches. This is a rather dark bird, with a white throat, two white patches on the tail which form a transverse band near the tip, and a conspicuous white patch in each wing. The female lacks the white markings on the tail, and has a buff-colored throat. It is found with great regularity in the fields adjacent to the West Okoboji railroad station. Here, high over the open fields, I have seen it perform its high-dive and boom very late in the nesting season. The nighthawk is an insect feeder, and the feeding is done entirely on the wing. Insects varying in size from a mosquito to a dragonfly are reported among the food items of this bird. The Whippoorwill is very similar to the Nighthawk in size and general appearance, but it has not, so far, been found in our region.

Family MICROPODIDAE: Swifts

50. Chimney Swift. *Chaetura pelagica* (A fairly common summer resident. 7/10)

⁹ Bailey, Bert Heald. The raptorial birds of Iowa. Iowa Geol. Surv. Bull. 6: 191. 1918.

¹⁰ Oberholser, Harry C. Monograph of the genus *Chordeiles*, type of a new family of goatsuckers. U. S. Nat. Mus. Bull. 86:52, 54. 1914.

The Chimney Swift is found in small numbers in nearly all of the towns, and is infrequently seen flying over the fields.

Length, 5.5 inches. These birds are wholly black in plumage. Once known, they may always be recognized by their peculiar flight, which is rapid and erratic, and which often gives the appearance of alternate wing action; the apparent alternate wing action does not, however, seem to have been demonstrated. The twittering call notes also furnish an easy means for recognizing this bird. Formerly these swifts built their nests in the hollow trunks of large trees, but, since the coming of the white man, they have uniformly preferred the chimneys of buildings. Swifts are insectivorous, and feed on the wing. They are wholly beneficial.

Family TROCHILIDAE: Hummingbirds

51. Ruby-throated Hummingbird. *Archilochus colubris* (A fairly common summer resident and migrant. 5/10)

During the month of August, 1912, the stream from the Willow Spring, adjacent to the Laboratory grounds on the south, was banked by a dense growth of the jewelweed (*Impatiens biflora*) in blossom. These flowers attracted an unusual number of hummingbirds, as many as twelve being counted at one time; they lingered there throughout the month. No adult males were among them. Dr. F. J. Smith told me that hummingbirds visit his premises on Miller's Bay with more or less regularity.

Length, 3.75 inches. The upper parts are of a beautiful iridescent, greenish hue, and the under parts are white. The male has a ruby-colored throat, which is lacking in the female and juvenile birds. Since only one species of hummingbird visits this region, there need be no difficulty in identification; but in the twilight of evening many people mistake the sphinx moths for hummingbirds.

The ruby-throats are probably chiefly insect feeders. But there is also plenty of evidence showing that they feed upon the nectar of flowers. Miss Althea R. Sherman, of National, Iowa, carried out some interesting experiments with hummingbirds by placing vials of sweetened water in the corollas of flowers at which they were wont to feed. She was thus able to keep the birds around her home, and frequently had to refill the vials after their contents had been exhausted by the hummers.

Family ALCEDINIDAE: Kingfishers

52. Belted Kingfisher. *Megasceryle alcyon* (A common summer resident. 10/10)

This species is likely to be seen over any body of water in the region, and especially around the lake shores. The subspecies is undoubtedly *alcyon*.

Length, 13 inches. This bird is so common around the lake that it is hardly necessary to give the description. The upper parts are bluish; the under parts are white; the upper breast is crossed by a bluish band, and in the female only there is a narrower band of chestnut color, which extends also along the sides. The bird possesses a long crest, and a long, very heavy bill. The call is a loud, harsh, rattle, uttered with explosive emphasis.

The young are reared in a horizontal burrow in a sand or gravel bank. The food of the Kingfisher consists largely of small fish, but insects, frogs, etc.,

are also eaten. The Kingfisher has been accused of destroying young game fish in hatcheries, and there is no question of his guilt. In one day at Spearfish, South Dakota, I saw the men at the fish hatchery shoot four or five of these birds. I have no idea how many days this was repeated, or whether other hatcheries do the same. It seems like a heedless and wasteful practice.

Family PICIDAE: Woodpeckers

53. Northern Flicker, *Colaptes auratus luteus* (A common summer resident. 10/10)

Length, 12 inches. The top of the head is gray with a scarlet patch across the nape. The breast is vinaceous, and contains a black crescentic patch. The breast and whitish belly are heavily marked with round, black spots. The shafts of the quill feathers are yellow, and the rump is white, these two characters showing best in flight. The male has a black mustache mark, which is lacking in the female. Flickers are very generally distributed, and are often seen on the open prairie as well as along the forest margin. The Flicker nests in the cavities of old trees, but most of the feeding is done on the ground, and he is reputed to be very fond of ants. Where fruit is plentiful, it is sometimes eaten. The call and song may be used in identification.

54. Red-headed Woodpecker, *Melanerpes erythrocephalus* (A common summer resident. 10/10)

Length, 10 inches. As the name indicates, the entire head is red; the belly is white; the upper parts are black and white. No other summer bird need be confounded with this one. The young birds do not have the red head, but a gray one instead. These birds may be found in any part of the lake region, but there is always plenty of distance between any two pairs. In diet they are chiefly insectivorous, but are also to a slight extent frugivorous. It is a common habit with them to dart out from some dead limb or telephone pole to capture some insect on the wing. The call is a harsh, discordant croak, which may be used in identification.

55. Hairy Woodpecker, *Dryobates villosus* (A fairly common summer resident. 7/10)

Dr. Oberholser (Proc. U. S. Nat. Mus. 40: 600, 1911) has reported the subspecies *villosus* from Dickinson County, Iowa.

Length, 9 inches. The upper parts are black and white; the wings are black speckled with white; and the middle of the back is white. The under parts are white. The middle tail feathers are black; the outer ones are white. A black line runs through the eye, bordered above and below by white lines. In the male there is a conspicuous scarlet patch on the nape of the neck, which is absent in the female. See also the description of the next species.

The Hairy Woodpecker feeds almost exclusively upon insects and their larvae, which it excavates from the bark and wood of trees.

56. Downy Woodpecker, *Dryobates pubescens* (A common summer resident. 10/10)

The subspecies *medianus* is to be expected here.

Length, 6 inches. The Downy is almost a counterpart of the Hairy Wood-

pecker, except in size, and the fact that the outer, white tail feathers are barred more or less distinctly with black. Sometimes it may be difficult to determine whether a bird is a Downy or a small Hairy; then it will be necessary to look for the tail markings just mentioned. The Hairy has a somewhat louder call, but this is not always a sure criterion. Beginners should not be too quick to name either of these common birds in this region without care to exclude the other. The male of the Downy, as in the case of the Hairy, has the scarlet nape, while the female does not. The Downy is insectivorous, and its habits are similar to those of the Hairy.

Family TYRANNIDAE: Tyrant Flycatchers

57. Kingbird. *Tyrannus tyrannus* (An abundant summer resident. 10/10)

This bird may almost be regarded as the dominant species of the region. It is found practically everywhere, along the lake shores and over the open fields, throughout the county.

Length, 8.5 inches. The head, back, and wings are dark — almost black; the *under parts and tip of tail are pure white*. It becomes easy to identify this species by its harsh call-note. Our flycatchers, including this and the next six species, are insect-feeders of high rank. Almost any kind of an insect that flies, and some that do not, is subject to capture by the Kingbird. An enormous amount of insect material is consumed in rearing a single brood of young Kingbirds. In a brood under observation at the Lakeside Laboratory about 22 per cent of the food given to the young birds consisted of short-horned grasshoppers. In the same brood nearly 16 per cent of the nestling food consisted of dragonflies. Other food items included were beetles, spiders, flies, mayflies, and various larvae. The choice of insects seems to depend to some extent upon the supply; that is, when the Kingbird nests near the lake shore, a great deal of its feeding is done over the water, in which case nearly 50 per cent of the food brought to the nestlings consists of Odonata (dragonflies and damselflies). When it nests along the roadside on the prairie, the bulk of the food for the young consists of grasshoppers, etc.

58. Arkansas Kingbird. *Tyrannus verticalis* (A common summer resident. 10/10)

The Arkansas Kingbird is a western species which has pushed its way eastward beyond the Missouri River in recent years. It had reached the Okoboji region as early as 1902; for in July of that year Dr. B. H. Bailey shot a female at the upper end of Spirit Lake. In 1909 he took two juvenile males at Miller's Bay. This species is not quite so numerous as *tyrannus*, but is entitled to rank as "common."

Length, 9 inches. The head is ashy gray; the breast and belly are sulphur yellow; the back, wings, and tail are blackish, the latter being *bordered laterally with white*. This Kingbird prefers to nest in the artificial groves which surround farm houses, and many nests are found in the Lombardy poplars which are so plentiful. In habits it is very similar to the common Kingbird, but possibly somewhat more pugnacious and noisy. It has a characteristic call-note with which one quickly becomes acquainted. One brood of these birds under observation on the Laboratory grounds was fed an insect diet which included 47.5 per cent of various short-horned grasshoppers.

An incident in connection with a nest study of this species may be worth recording. During July, 1919, we had found a nest of the Arkansas Kingbird about twenty feet up in a tree on the Laboratory grounds. This nest was moved by easy stages to a crotch stuck in the ground so as to place the nest about thirty inches from the ground; and the nest was protected from marauders by an inverted dishpan. A blind was erected at a distance of about two feet, and continuous observation was maintained. This procedure was carried out with practically no interruption of the usual feeding routine of the birds. During the following observations the old birds brought and fed to the young a number of lace-winged insects which we were unable to recognize. After several of these had been brought in, we felt that it was necessary to find out what they were. So, with tweezers, I made a successful effort to secure one from the throat of one of the nestlings. It proved to be a cicada, and was carefully preserved. Later several entomologists were able to place it in the genus *Okanagana*, but were unable to determine the species. The specimen was finally submitted to Mr. Wm. T. Davis, of Staten Island, N. Y., who reported that it was a male of *Okanagana balli*, a species which was undescribed at the time our specimen was collected. It was, of course, a new locality record for Mr. Davis at that time. However, under date of January 21, 1920, Mr. Davis wrote me that he had found another specimen of this cicada from Lake Okoboji, Iowa, in the collections of the U. S. Biological Survey at Washington, which had been collected and sent there in 1917 by Mr. L. L. Buchanan (two years before the species had been described).

59. Crested Flycatcher. *Myiarchus crinitus* (An uncommon summer resident. 6/10)

The subspecies to be expected is *hircus*.

The greaterest was noted each year from 1913 to 1917, inclusive, in the wooded region around Elm Crest, and in no other locality. In 1918 and 1919 it was not found, possibly because of the increased number of cottagers by that time spending the summer there. In 1921, however, Dr. Arthur F. Smith heard the greaterest in the same locality. In 1915 a pair of the birds nested in a large tree stump which stood about fifteen feet out in the water of the lake near Gull Point.

Length, 9 inches. This flycatcher possesses a distinct crest, which is depressed much of the time and therefore not an infallible field mark. The upper parts shade from an olive-gray color in the head region to a reddish-brown on the tail, the latter being without the white lateral border. The throat and breast are ashy, while the belly is sulphur yellow. The call note is distinctive.

60. Phoebe. *Sayornis phoebe* (A fairly common summer resident. 10/10)

Length, 7 inches. Dark, grayish brown above, and dusky white below. Wing bars are very indistinct, or absent. This species nests frequently under bridges and culverts, but in the vicinity of the lakes it often builds its nest on the porches or window ledges of the summer cottages, and may be in the midst of raising a brood when the cottagers arrive. Let us hope that such bird guests are treated with consideration while the young are still in the nest. The call

note consists of two syllables, *phce-bee*, accented sometimes on the first syllable, and sometimes on the second.

61. Alder Flycatcher. *Empidonax traillii* (An uncommon summer resident. 1/10)

In 1911, July 6, the writer found a nest of this species along the bank of the Little Sioux River (only a small stream at this point), a few miles west of Lake Okoboji. The nest was in the crotch of a willow sapling, about four feet from the ground, and was constructed chiefly of dry grasses. It contained three white eggs, rather heavily marked with brown spots at the large end. One parent bird remained in the tops of the nearby willow bushes all the time we were around, but did not utter a sound. She returned to the nest after we left.

I have also seen this species in the adjacent county of Emmet, along the wooded shore of Tuttle Lake, at the Minnesota border.

Length, about 6 inches — noticeably smaller than the Wood Pewee. The upper parts are brownish, tinged slightly with olive, but the wings and tail are darker; the under parts are dusky white, somewhat darker at the sides. Two light wing bars are present. The upper mandible is black, while the lower one is very light brown or horn color (this is a character, however, which does not distinguish this one from the other small flycatchers).

Dr. Oberholser¹¹ reports eight specimens of Traill's Flycatcher from Clay County, Iowa, and one from Palo Alto County, all taken in July and August, 1907.

62. Least Flycatcher. *Empidonax minimus* (An uncommon summer resident. 6/10)

This species is occasionally found in certain suitable locations, where it seems to return year after year. Most of the few records I have obtained of this flycatcher have been made in the neighborhood of the Lakeside Laboratory. In one year they were found nesting on the shore of Pratt Lake.

Length, 5.5 inches. The upper parts are dark with a shade of olive; the under parts are whitish, more or less washed with grayish tinge. There are two whitish wing bars, and a more or less distinct white eye-ring. It is usually difficult to distinguish this small bird from one or two other small flycatchers of the *Empidonax* group, and the beginner should be very cautious. The nest is usually built in a crotch of a tree, and the eggs are pure white. The Least Flycatcher seems, as a rule, to choose as a habitat the more open woodland, and nests at higher levels than the Alder Flycatcher. The call note of the Least Flycatcher consists of two syllables, *che-bee*, with the second syllable accented.

63. Wood Pewee. *Myiochanes virens* (A common summer resident. 10/10)

The plaintive call of the Wood Pewee may be heard around most of the lake shore, wherever there is a grove or small timber area.

Length, 6.5 inches. The upper parts are dark; the under parts are dusky on the sides, and almost white in the median line. Two more or less distinct *whitish wing bars* are present. The Wood Pewee is never found away from a

¹¹ Oberholser, Harry C. New light on the status of *Empidonax traillii* (Audubon). Ohio Jour. Science 18: 85-98, 1918.

small grove or forest margin. It may be easily recognized by the three-syllabled call note, *pee-a-weet*, uttered slowly and in the saddest of tones.

Family ALAUDIDAE: Larks

64. Prairie Horned Lark. *Otocoris alpestris praticola* (A fairly common summer resident. 8/10)

These birds inhabit the open country, and are frequently seen feeding in the country roadway.

Length, nearly 8 inches. The upper parts are brownish, tinged with vinaceous; the under parts are whitish. A large, black spot marks the breast, and an oblique black line extends from the bill to, and under, the eye. Above the eye runs a white line, which is bordered above by a black line consisting of erectile feathers, the so-called "horns." The Prairie Horned Lark is a subspecies of the Horned Lark, or Shore Lark, which shows yellow around the face and throat where the former is white. The call of these birds is a very weak twitter usually uttered while on the wing.

Family HIRUNDINIDAE: Swallows

The following key may be of assistance to the beginner in making field identifications of the swallows which may be found in our region.

- A. Under parts glossy blue-black.....Purple Martin, male
- B. Under parts reddish:
 - a. Rump orange color; tail only slightly forked.....Cliff Swallow
 - aa. Rump same color as back; tail deeply forked.....Barn Swallow
- C. Under parts whitish:
 - a. Upper parts with metallic iridescence:
 - b. Size small; throat white.....Tree Swallow
 - bb. Size large; throat dusky gray.....Purple Martin, female
 - aa. Upper parts brownish gray:
 - b. Throat white; distinct blackish breast band.....Bank Swallow
 - bb. Throat white; ragged, dusky breast band...Tree Swallow, juvenal
 - bbb. Throat dusky; diffused dusky breast and belly.....

.....Rough-winged Swallow

65. Tree Swallow. *Iridoprocne bicolor* (A fairly common summer resident. 8/10)

The Tree Swallows prefer to be near water, although they do not use mud in building their nests. The nests are always placed in a prepared cavity, either in a dead tree, or fence post, or similar place. They have been found nesting at Gull Point, at the north end of Spirit Lake, in a fence post near the golf links at Miller's Bay, etc. They collect in great numbers by the last week in August, preparatory to migration. Some account of their flocking habits is given in the introduction to this paper.

Length, 6 inches. The upper parts are metallic with greenish to bluish iridescence. The under parts are wholly white. Juvenile birds are brownish gray above, with no bluish; they are white below with an ill-defined dusky band across the breast, which may also extend backward in the median line. Care must be exercised in the late summer to distinguish these immature Tree Swallows from the Rough-winged Swallows.

66. Bank Swallow, *Riparia riparia* (An abundant summer resident. 10/10)

Many colonies of Bank Swallows are to be found in this lake region, in the banks formed by the erosion of small runlets, gravel pits, along the banks of the Little Sioux River, etc. These birds begin to flock by the middle of July, and often form flocks of considerable size. On July 18, 1912, a large flock was observed near Emerson's Bay. The birds were perched on the top and middle wires of a fence, and practically filled about fourteen sections of it, with one bird between each pair of barbs. It was found by counting that the average number of barb spaces between posts was forty-five. Therefore, this flock must have contained approximately 1260 birds. There were a good many more beyond the fourteen sections of fence, but we may allow these to offset the vacancies within the area computed. But there were still hundreds of others out in the weeds bordering the swamp. It is probable that there were close to 2000 Bank Swallows in this entire flock.

Length, 5.25 inches. The upper parts are grayish brown. The throat is white, and the belly whitish. There is a blackish band across the upper breast, sharply cut off from the adjacent white parts.

67. Rough-winged Swallow, *Stelgidopteryx ruficollis serripennis* (A fairly common summer resident. 10/10)

While this species is common enough to be found each season, it is nevertheless quite locally distributed. Two or three pairs usually nest in the high and denuded banks bordering certain parts of Miller's Bay. It is the least numerous of all the swallows except the Cliff Swallow. In breeding habits the Rough-winged Swallow is very similar to the Bank Swallow, both using an excavation in a vertical dirt bank. But I have never found the Rough-winged Swallow breeding in colonies.

Length, 5.75 inches. The upper parts are grayish brown. The under parts are dusky white, very much darker on the breast. The throat is dusky, rather than white as in the Bank Swallow, and, of course, there is no sharply defined black band on the breast.

68. Barn Swallow, *Hirundo erythrogaster* (An abundant summer resident. 10/10)

The vernacular name of this species is significant, and nearly every farm yard has its colony of Barn Swallows. Occasionally, however, they choose other sites. Around the lakes they have nested under bridges, under the roofs of cottage porches, and under the laboratory and boat-house on the grounds of the Lakeside Laboratory.

Length, 7 inches. The upper parts are a dark metallic blue. The forehead is chestnut. The throat is chestnut, shading into a paler tint on the belly. The tail is deep blue, spotted with white, and *deeply forked*.

69. Cliff Swallow, *Petrochelidon albifrons* (An uncommon summer resident. 5/10)

In 1912, 1913, 1916, and 1921 this species was noted at West Okoboji, and was noticed carrying mud in 1913. In 1916 and 1917 it was found about a mile west of the Lakeside Laboratory; and in August, 1921, once at West Okoboji and once at the north end of Spirit Lake. But never more than one

or two have been seen at one time, except that a family of five was noted at West Okoboji in 1913.

Length, 6 inches. The upper parts are dark metallic blue. The rump is orange, and the forehead is whitish. The throat is very dark chestnut, shading into a dusky breast and white belly.

70. Purple Martin. *Progne subis* (A fairly common summer resident in the towns, 10/10).

The martin is our largest swallow, and seems to have successfully established itself in the towns of Spirit Lake, Milford, Spencer, and doubtless other localities. It usually nests in and about the signs and cornice-work of the business buildings, and in martin houses, of course, when they are available.

Length, 8 inches. The male is purplish black above and below. The female is whitish below, and not quite so glossy above. The shape and flight usually will identify these birds as swallows. They lend an air of cheerfulness to a business street which is usually very pleasing to the stranger.

Family CORVIDAE: Crows and Jays

71. Bluejay. *Cyanocitta cristata* (A common summer resident, 10/10)

Length, 12 inches. This bird is too well known to need description. It is common in the lake region. Notwithstanding its beautiful plumage the Bluejay has few admirers, at least among those who know its habits. He well deserves the title of "gay marauder" as applied by Rev. Leroy Titus Weeks. His screeching calls are never confused with those of any other bird.

72. Crow. *Corvus brachyrhynchos* (A common summer resident, 10/10)

The Crows formerly nested in the timber near Elm Crest, but probably do so no longer, since there is more or less human activity there during the nesting season. While Crows are always present, they do not occur in excessive numbers during the summer season.

Length, 19 inches. The entire plumage is black. The Crow does not have many friends. The farmer sees the Crow in the field of young corn, finds some hills uprooted, and charges him with the damage. The farmer does not take the trouble to look into the Crow's stomach, and so the latter gets little credit for the insects and mice he consumes. Perhaps the merits and demerits of the Crow are in about the proportion of fifty-fifty, and he seems to have considerable ability to take care of himself in competition with men.

Family PARIDAE: Titmice, Chickadees

73. Black-capped Chickadee. *Penthestes atricapillus* (A common summer visitor, 10/10)

The chickadee is widely distributed. While its breeding habitat is in the woodland, it ranges widely as soon as nesting duties are over, and then may be seen almost anywhere.

Length, 5.25 inches. The color above is grayish, and below, whitish. The throat and crown of the head are black. The sides and flanks are often tinged with yellow. The nest is made in cavities in trees or posts.

74. Tufted Titmouse. *Baeolophus bicolor* (A casual summer visitor, 1/10)

A small flock of about six titmice, probably a brood, was seen on the

wooded east shore of East Lake Okoboji on July 8, 1915. This is our only record. It is possible that they breed in this region, but we have insufficient evidence.

Length, 6 inches. The color of the upper parts is gray, and of the under parts is white. The flanks are reddish brown. The forehead is black. A conspicuous crest is present, but may, at times, be so depressed as to escape notice. In size and behavior these birds are very much like chickadees.

Family SITTIDAE: Nuthatches

75. White-breasted Nuthatch. *Sitta carolinensis* (A fairly common summer resident. 7/10)

This is a bird of the woods and forest margin. It is always creeping up or down the tree trunks in search of insects and other animal matter, and always proceeds head first. The bird is always busy, seldom being seen at rest.

Length, 6 inches. The body is grayish blue above; the under parts are white. The crown and nape are black. The outer tail feathers are black and white.

Family TROGLODYTIDAE: Wrens

76. Western House Wren. *Troglodytes aedon parkmani* (An abundant summer resident. 10/10)

There is scarcely a cottage along the lake shore of Lake Okoboji or Spirit Lake which does not have one or two pairs of these tenants on the premises. Less frequently it lives in the woods, away from human habitation. To most of the cottagers of this region the song of the wren will always bring to mind a picture of their summer home at the lakes.

Length, 4.75 inches. The small body is grayish brown above, and dusky below. The wings and tail are delicately barred with black. There will be little difficulty in identification because there is no other wren beyond the marshes during the summer season.

77. Prairie Marsh Wren. *Telmatodytes palustris dissaëptus* (A common summer resident. 10/10)

This is a shy, inconspicuous bird, which can be seen only in the marshes where it lives. It does not often rise above the reeds and cattails, and one may have to wade into the marsh to get a glimpse of this elusive bird, or to examine its nest; for these birds always inhabit a *wet* marsh. There are so many such marshes in our lake region that this marsh wren may be said to have a wide distribution in the lake region of Iowa. The nest is built of grasses woven securely to several erect stalks of *Typha*, *Sparganium*, or other reeds, and is placed twelve or fifteen inches above the water; the nest is spherical, with a side entrance. The eggs are dark reddish brown in color, thus being easily distinguished from those of the Short-billed Marsh Wren, which builds a similar nest though in a different location. The song of the Prairie Marsh Wren is a monotonous rattle, with a distinct metallic tone. There is some chance for it to be confused with the song of the Swamp Sparrow, but the latter lacks the metallic tone, and is considerably slower in utterance. The Prairie Marsh Wren sings regularly through June and July, but is silent for the most part during August.

Length, 5 inches. It can be distinguished from the Short-billed Marsh Wren by its solid black crown, by its slightly larger size, and by its song.

78. Short-billed Marsh Wren, *Cistothorus stellaris* (A fairly common summer resident, 5/10)

This smaller marsh wren is even more seclusive than its long-billed relative. It is more likely to be found in meadows and dry kettle-holes, where the slough grass is rank. The Short-billed Marsh Wren is not so particular about being near water. The nest is spherical with a side opening, and is built on or close to the ground in a tussock of grass. The eggs are pure white. The song is very different from that of the other marsh wren, being broken into syllables. Although there is a great amount of individual variation in the song, it most frequently runs like this; *chuck-chick-che-e-e-e-e-e*. Sometimes it sounds more like this; *dick-dick-ciss-ll-ll*, and then one may think he is listening to the Dickcissel; and even the experienced observer may be confused. But the wren's song always has a metallic tinkle which is lacking in the Dickcissel's song. I have never heard the song of the Short-billed Marsh Wren during June or early July; but during the latter part of July and throughout August it sings with great energy.

Length, 4 inches. It may be distinguished from the Prairie Marsh Wren by the mixture of white specks in the black crown, by its slightly smaller size, and by its song. It is almost impossible to flush this bird so as to get a good view of it, for it skulks so persistently. Much patience is often necessary for its study, but this is well rewarded when a good view is obtained. The habitats of these two marsh wrens are so unlike that a presumptive identification may be established almost at once on that basis.

Family MIMIDAE: Thrashers, Mockingbirds

79. Catbird, *Dumetella carolinensis* (A common summer resident, 10/10)

The Catbird is found along the lake shore in wooded places where there is considerable undergrowth. The Catbird must have a thicket to play in and nest in. It may occasionally find such a suitable habitat in the shelterbelt of a farm house.

Length, 9 inches. The body is dark gray, with the crown of the head and tail back. The undertail coverts are chestnut. During the spring and early summer this species rivals the Brown Thrasher in song, and one may often be puzzled as to which of these birds is the songster.

80. Brown Thrasher, *Toxostoma rufum* (A common summer resident, 10/10)

The Brown Thrasher is a bird of the thicket, but is also seen along the roadside where a cluster of bushes or a wild grape vine gives enough shelter for a nest. This bird is less secretive and less wary of man than its relative, the Catbird.

Length, 11.5 inches. The tone color is light brown; the breast is whitish, heavily streaked with brown. The tail is very long, and the bill is long and curved. The Brown Thrasher is one of our finest songsters. The song is similar to that of the Catbird, but is louder and bolder. The Catbird's song is milder and sweeter. Which of the two is the better songster is often a matter of argument.

Family TURDIDAE: Thrushes

81. Robin, *Turdus migratorius* (A common summer resident, 10/10)

The Robin is more likely to be found in the towns and around the farm houses than in the woodland around the lakes.

Length, 10 inches. The body is dark, slaty gray on the back; the wings and tail are fuscous, and the head is almost black. The breast is reddish brown.

82. Wood Thrush, *Hylocichla mustelina* (An uncommon summer resident, 4/10)

The only two localities in which this species has been found are the wooded region around Marble and Hottes Lakes and the immediate vicinity of Arnold's Park.

Length, 8.25 inches. The back and tail are reddish brown, while the head is a much lighter and brighter shade of brown, almost rufous. The breast is white with numerous conspicuous black spots. The song is very distinctive, a flute-like "pee-o-lee," and forms an easy means of identification.

83. Bluebird, *Sialia sialis* (A common summer resident, 10/10)

The Bluebird is a relative of the Robin, but seems to be less attached to human associations; it is likely to be found breeding anywhere in the region, except in the heavier woods. Fence posts are very plentiful in the country, and hence a cavity in one of them is a very common location for the nest of the Bluebird.

Length, 7 inches. The upper parts, including wings and tail, are blue. The throat and breast are chestnut. The colors of the female are less marked. The Bluebird may be distinguished from the Indigo Bunting by the lighter shade of blue, and by the presence of the red on the under parts.

Family BOMBYCILLIDAE: Waxwings

84. Cedar Waxwing, *Bombycilla cedrorum* (A casual summer visitor, 1/10)

On June 25, 1917, a small flock of eight Cedar Waxwings tarried for a few moments in the woods near Elm Crest. This is the only summer record within the period of this study, but it may be inserted here that a single individual of this species was observed on June 24, 1928, in the town of Spirit Lake by William Youngworth and the author. While from the evidence at hand we rate this bird as a casual visitor, there is very much likelihood that it may eventually be found to be a summer resident.

Length, 7 inches. Head, breast, and back brownish. The wings and tail are grayish, the latter being tipped with a narrow yellow band. The belly is yellowish, and the undertail coverts are whitish. (In the Bohemian Waxwing the undertail coverts are chestnut.) Both sexes have a well-developed crest.

The waxwings are known to be more or less erratic in their movements, and in many localities are rather late in nesting. They are chiefly frugivorous, but depend mostly on wild fruit; their depredations in the cherry orchard are probably only locally serious. The waxwings are sometimes colloquially called the "Chatterers," which is about as meaningless a name as could have been chosen. The name of "Cherry Bird" does not seem to have much greater significance.

Family LANIIDAE: Shrikes

85. Migrant Shrike. *Lanius ludovicianus migrans* (A fairly common summer resident. 2/10)

Two individuals were seen along the roadside several miles west of Lake Okoboji in August, 1915. On June 24, 1921, fourteen shrikes were noted along the roadside in a trip around the Okoboji lakes. All that could be certainly identified were *migrans*, and it is supposed that all were the same. Altogether twenty-six of these birds were noted during the summer of 1921 in the close vicinity of the lakes. As compared with the two individuals noted in the same general region (which had been covered practically as thoroughly) during the preceding nine summers, there seems to be considerable difference in abundance. Perhaps there is a tendency toward increase. One or two of the birds observed had rather a distinct white rump, but it is not considered sufficient evidence for listing *excubitorides*.

Length, 9 inches. The crown of the head and back are gray. The under parts are pure white. The wings and tail are black marked with white. A black patch extends through and behind the eye. The rump is the same color as the back in *migrans*, but in *excubitorides* it is white. The latter subspecies is the western form whose range extends eastward to about the Missouri Valley.

The shrikes are addicted to the habit of using the telephone wires along the roadsides for lookout perches. It is well known that they are both insectivorous and carnivorous. The Migrant Shrike, like the other shrikes, often impales its food on thorns. In June, 1921, I found the head of what appeared to be a striped gopher (*Citellus tridecemlineatus*) impaled on a broken stem of a box-elder tree, and attended by a pair of Migrant Shrikes.

Family VIREONIDAE: Vireos

The vireos are foliage gleaners, and are never seen away from trees. They are small birds, seldom noticed by the casual passerby. While we have found only three species of vireos during the summer season, others are likely to be found either as migrants or summer residents, and the following key may be of some service in differentiating them. It has seemed rather strange to us that Bell's Vireo has not been found as yet in this region.

Field Key to the species of vireos

- A. With whitish wing bars:
 - a. Lores and eye-ring yellow:
 - b. Throat yellow.....Yellow-throated Vireo
 - bb. Throat white.....White-eyed Vireo
 - aa. Lores and eye-ring white:
 - b. Crown bluish gray; length over 5 inches.....Blue-headed Vireo
 - bb. Crown ashy gray; length under 5 inches.....Bell's Vireo
- B. Without wing bars: white line over eye:
 - a. Crown dark gray with black-line border.....Red-eyed Vireo
 - aa. Crown light gray without black border.....Warbling Vireo

The Philadelphia Vireo is very similar to the last two named in the key, but it is rare, and can be safely identified only in the hand.

86. Yellow-throated Vireo. *Vireo flavifrons* (A fairly common summer resident. 9/10)

The Yellow-throated Vireo selects a habitat quite similar to that of the Warbling Vireo, viz., the forest margin. It has nested regularly for several summers either on the Laboratory grounds or in the shelter belt of the adjacent farm. It has also been seen on the shore of Brown's Bay, at Orleans, and at the north end of Spirit Lake.

Length, 6 inches. The body is olive green above; two whitish wing bars mark each wing. The lores and eye-rings are yellow, and the throat and breast are bright yellow. It is possible to confuse the songs of the Red-eyed and Yellow-throated Vireos; but the latter has a harsher, less liquid voice. The song of the yellow-throat is somewhat slower, and usually consists of two distinct notes uttered in rather deliberate succession, as compared with the red-eye.

87. Red-eyed Vireo. *Vireo olivaceus* (A common summer resident. 10/10)

The red-eye loves the deeper woods, and one will seldom fail to hear or see him in the woods near Elm Crest and Gull Point.

Length, 6.25 inches. The upper parts are yellowish green, and the under parts are white. The crown is gray, bordered laterally with a black line. There is a white line over the eye, but no wing bars. The song of the Red-eyed Vireo is quite characteristic, but has some resemblance to that of the Yellow-throated Vireo.

88. Warbling Vireo. *Vireo gilvus* (A common summer resident. 9/10)

The Warbling Vireo is a bird of the forest margin and grove, rather than of the deep woods. It will be found in orchards, artificial groves, and in the forest fringe along the lake shores.

Length, nearly 6 inches. The upper parts are grayish, with a slight olive tinge visible at close range and in good light. The under parts are white, sometimes with a yellowish wash on the sides. There is a white line over the eye. This species can always be safely recognized by its song.

Family COMPSOTHTLYPIDAE: Wood Warblers

89. Black and White Warbler. *Mniotilta varia* (An uncommon early fall migrant. 2/10)

Two individuals were seen on August 18, 1912, along the shore of Miller's Bay; and five were seen along the west shore of Spirit Lake on August 26, 1915.

Length, 5.25 inches. The body is heavily streaked with black and white. The outer tail feathers are tipped with white. This warbler may be found anywhere along the wooded shores during its migration. Its habit is to work up and down the trunks of trees in search of insects and their larvae or eggs.

90. Prothonotary Warbler. *Protonotaria citrea* (A rare summer resident. 3/10)

An occupied nest of this species was found at Elm Crest on July 4, 1914. A full account of this was published in the *Wilson Bulletin*, (vol. 30: 109-115, 1914). These birds also nested in the same vicinity in 1915 and

in 1916, but have not been seen since. These particular birds nested in an empty tomato can which had been nailed to a tree for the wrens.

Length, 5.5 inches. The head and body are bright yellow, sometimes showing a tinge of orange below. The back is greenish yellow. The wings and tail are ashy with a tinge of pale bluish. The tip of the tail is distinctly marked with white. The bill is strikingly large, and is black in color. The nest is ordinarily built in natural cavities in trees, often artificial cavities, and is always located near water. A peculiar habit which seems to be quite general and characteristic is the use of moss in the construction of the nest.

91. Yellow Warbler. *Dendroica aestiva* (A common summer resident. 10/10)

This is one of the two warblers known to breed in our lake region. In 1912, a group of students at the Lakeside Laboratory carried on an intensive nest study of a breeding pair of these birds; altogether 144 hours and 53 minutes were spent at the "bedside" of these birds. The full report was published in the *Wilson Bulletin* (vol. 25: 49-67, 1913).

Length, 5 inches. The entire body is yellow, but the wings and tail are darker. The yellow breast of the male is distinctly streaked with reddish; these streaks are hardly visible in the female.

92. Grinnell's Water-Thrush. *Sciurus noveboracensis notabilis* (A rare early fall migrant. 1/10)

A single Grinnell's Water-Thrush was noted by the writer on August 29, 1921, feeding along the little stream which flows through the first ravine south of the Lakeside Laboratory. It is very probable that this bird becomes more common in this region a few weeks later in the season.

Length, about 6.25 inches. The upper parts have a uniform olive tinge; the under side of the body is slightly tawny, heavily streaked with black. A narrow superciliary line is buffy. The typical habitat of this bird is along the shore of shallow waters, but during migration it may often be found at great distances from water. The Louisiana Water-Thrush (*S. motacilla*) is very similar in size and markings, but the under parts, and especially the line over the eye, are whiter; but this species has not been positively identified in this region as yet.

93. Maryland Yellow-throat. *Geothlypis trichas* (A common summer resident. 10/10)

The Maryland Yellow-throat prefers to inhabit a rank growth of vegetation, and so it is usually found around the borders of sloughs and kettle-holes, or along the marshy borders of streams. The nest is built on the ground in a tussock of grass, or close to the ground in a low bush (such as the wolfberry, *Symphoricarpos*).

Length, 5.25 inches. The body is greenish yellow above, with a bright yellow breast. A broad black line extends from the bill through the eyes; this black "mask" is bordered above with white which gradually shades off into the darker color of the crown. The female does not have the black mask. No other bird which we have has a song anything like that of the yellow-throat. Our birds of the lake region seldom sing the typical song, which is usually written thus, "witchity-witchity-witchity," and which is given with a fullness and rol-

licking abandon that suggests great energy. The birds of the Okoboji region with few exceptions, if any, seem to lack these song characteristics, and the variations which I have noted in the field may be put down thus:

Che-wich, e-wich, e-wich, e-wich

Che-wich, e-wich, e-wich

Che-wich, e-wich, e-wich-e

94. Wilson's Warbler. *Wilsonia pusilla* (A rare early fall migrant. 1/10)

The only record I have is that of a single individual observed on August 24, 1921, in the trees along the shore of Miller's Bay.

Length, 5 inches. This is a bright yellow bird, with a more or less greenish tinge. It looks very much like a Yellow Warbler, but the male has a black crown, which the female does not usually have. It is true that the warblers are very difficult to identify in the fall, except those males which do not undergo a change in color pattern in the postnuptial molt.

95. Redstart. *Setophaga ruticilla* (A rare early fall migrant. 2/10)

Professor H. M. Kelly saw several Redstarts in early August, 1919, in the oak timber along the Little Sioux River. On August 29, 1921, the author saw a female Redstart on the Laboratory grounds. These may have been migrants, but, on the other hand, the probability is great that the Redstart breeds in the woodlands of this region. As a slight indication of this we may mention that the author saw a male Redstart in the wooded Des Moines Valley on July 7, 1914. The oak groves bordering the lakes would seem to be an ideal habitat for this species, and we expect that it will eventually be found as a summer resident.

Length, 5.5 inches. Head, back, tail, and wings of the male are black. A scarlet-orange patch marks each wing, and the basal portion of the outer tail feathers is of the same color. The female is grayish to olive above and whitish below; and is yellowish on the wings and tail instead of reddish, as in the male.

Family ICTERIDAE: Blackbirds, Meadowlarks, etc.

96. Bobolink. *Dolichonyx orizivorus* (A common summer resident.¹²)

The low hovering flight of the Bobolink over the meadows is a familiar sight. Because of the abundance of this habitat in the Wisconsin Drift, Bobolinks have been quite numerous during the breeding season.

Length, 7.25 inches. The male Bobolink is readily recognized in the early summer by his characteristic black and white plumage. The body is black, but a large white patch covers the rump and part of the back. A large buff-colored spot covers the back of the head and neck. The female may be described as sparrow-like in color, but having the longer, icterine bill. The Bobolink inhabits the long-grass meadows, where the ground is usually too low to be cultivated. While these birds are reputed to do much damage to the rice crops in the south, they are regarded as wholly beneficial in the north. Their diet is largely insectivorous during the breeding season, becoming more granivorous during migration, apparently. This is one of the birds that can put the spell of romance on the sunny fields in which he sojourns.

¹² This estimate applies only to the period under consideration. The author's more random observations since that time have indicated a decrease in this species.

97. Western Meadowlark. *Sturnella neglecta* (A common summer resident. 10/10)

The Meadowlark will be found in the open, uncultivated fields. While it is rated here as common, yet it does not occur in large numbers. The nest is built on the ground, and is usually well concealed by a grass dome. In general the food is similar to that of other members of the blackbird family.

Length, nearly 11 inches. The upper parts are light brownish, mottled more or less with black. The throat and belly are yellow, and there is a small, yellow spot in front of the eye. A large black patch marks the breast. The outer tail feathers are white. The song of the western meadowlark is a feature of the prairie, and there is none other like it. The eastern Meadowlark (*Sturnella magna*) has not been found in Dickinson County, so far as I am aware.

98. Yellow-headed Blackbird. *Xanthocephalus xanthocephalus* (A common summer resident. 9/10)

The distribution of this species depends very much upon suitable breeding grounds. The years 1911, 1912, and 1913 were low-water years, and many of the sloughs had an abundant growth of rushes. The years following have been high-water years, and the aquatic vegetation has not succeeded so well. In 1919 there was no growth of rushes in the Green Slough at all; and there were no yellow-heads there. The same condition prevailed in 1921. Possibly if the high-water level remains for a few years a new zonation of aquatic vegetation may be established, with the return of several species of marsh-nesting birds. The same remarks apply to a number of the other larger sloughs adjacent to Lake Okoboji, e.g., the Mile-long Slough, near Hayward's Bay. However, it is more likely that the coarse fish, carp and buffalo, have had more to do with the disappearance of the rushes.

The migration of the Yellow-headed Blackbird occurs in August, although they begin to flock early in July. Toward evening of August 15, 1912, in the vicinity of Pratt Lake, five or six immense flocks of these birds flew in, most of them stopping at the lake shore for water, or to rest. I roughly estimated that each flock contained anywhere from a thousand to two thousand individuals. In all of these not a single male in nuptial plumage was seen; the yellow was confined to the throat and upper breast.

Length, 10 inches. The male has a black body with a bright yellow head and neck, the yellow extending well down on the breast. There is a white patch on each wing, which is very conspicuous in flight. The female is much less brilliantly colored. These birds breed among the cattails and rushes, to which their nests are attached. The food of the yellow-head is composed of insects, weed-seeds, and grain, in approximately equal quantities. Their harsh, raucous call notes are not easily described, but are useful in identification.

99. Red-winged Blackbird. *Agelaius phoeniceus* subspecies (An abundant summer resident. 10/10)

Length, 9.5 inches. The black male is unmistakably marked by the red shoulder patch. The female is a very different bird, having a light breast heavily streaked with black.

Northern Iowa seems to be between the breeding ranges of two subspecies, *fortis* and *artolegus*, and a series of specimens will have to be taken to deter-

mine which of the two occupies the lake region. These birds inhabit the marshes, along with the yellow-heads, and are seldom seen in other localities, except during migration. Like other members of the blackbird family the red-wings's diet includes both animal and vegetable matter. Farmers in northern Iowa have charged the red-wing with considerable damage to the grain in late summer. Considering the food of these birds for the year round, we would probably conclude that they are much more beneficial than harmful. Many studies have been made on their food habits, and abundant laboratory evidence is available. There is perhaps an opportunity here for an intensive field study of the food habits of these birds at this particular season.

100. Orchard Oriole. *Icterus spurius* (A fairly common summer resident. 10/10)

Length, nearly 7.5 inches. The head, neck, wings, and tail of the male are black; the belly and back are a deep chestnut red. The female is all yellowish, with darker coloring on the wings and back.

The molting of the Orchard Oriole is of considerable interest. The male does not acquire his mature plumage until the beginning of the second year. During his first breeding year, the male is practically like the female, except for a distinct black patch on the throat.

The nest of this oriole is built entirely of green grass, which is deftly woven into a hollow sphere, with an opening in the side; it very soon changes into the yellow color of dry grass. The nest is most often located in an orchard or similar open group of trees. The Orchard Oriole is a rival of the Bobolink and Meadowlark in singing ability, these three being the only musical members of their family.

101. Baltimore Oriole. *Icterus galbula* (A common summer resident. 10/10)

Length, 7.5 inches. The male is orange and black in color. The head, upper back, wings, and part of the tail are black; the breast, lower back and rump, and distal end of the tail are orange. The female is yellowish green, with white markings on the wings.

These are birds of the forest margin. Their nest is built of dry grass, string, and suitable material for weaving, and is suspended from the swaying tips of branches. The diet of the Baltimore Oriole is said to be four-fifths insects, notwithstanding the belief of many that he feeds largely on fruit.

102. Bronzed Grackle. Crow Black-bird. *Quiscalus quiscula aeneus* (A common summer resident. 10/10)

Length, 12 inches. The entire plumage is black, but is variously tinged with iridescent green and purple, especially on the head and neck. The Purple Grackle is an eastern form which has not been found in this region. The food of the Bronzed Grackle is about half animal matter and half vegetable matter, the latter containing a good deal of corn; but there seems to be no good evidence that the grackles ever pull up sprouting corn.

103. Cowbird. *Molothrus ater* (A common summer resident. 10/10)

There is a question whether the subspecies here is *ater* or *artemisiae*, since the latter is considered to be the breeding subspecies at Sioux City.

These birds are early both in arrival and in departure. I have never seen any

in this region later than July 24, and most of them have disappeared by the twentieth. And I have never observed them in flocks before they go, although the last birds may be seen flying about in a restless manner, uttering occasionally their peculiar rusty-hinge squeal.

Length, 7.5 inches. The plumage of the male is glossy black, except that the head and neck are coffee-brown in color. The color of the female is a more uniform brown. The Cowbird is the only bird in this country known to practice parasitism on other species, assuming no parental responsibility. This habit often results in more or less mortality for the other species imposed upon. There is still much to be learned about the life and habits of the Cowbird, and conditions around the Okoboji Lake region offer excellent opportunity for research along this line.

Family THRAUPIDAE: Tanagers

104. Scarlet Tanager. *Piranga erythromelas* (A fairly common summer resident. 9/10)

On July 10, 1911, Mrs. F. J. Lazell, of Cedar Rapids, discovered a nest of the Scarlet Tanager saddled on a limb of a bur oak tree, located on the old Harker homestead (later the Floete property). The nest was about four feet from the trunk and fifteen or twenty feet from the ground; it contained three tanager eggs and one Cowbird's egg. Another nest was found near Elm Crest on July 10, 1916, in a trunk crotch about twenty feet high; not examined. This is a woodland bird, and the rather dense timber along so much of the lake shore makes an excellent environment for it.

Length, 7.5 inches. The entire plumage of the male is brilliant scarlet, except the wings and tail which are black. The body of the female is greenish yellow, with dark wings and tail.

Family FRINGILLIDAE: Sparrows, Finches, Grosbeaks

105. Rose-breasted Grosbeak. *Hedymeles ludovicianus* (A common summer resident. 10/10)

Every season finds a pair of grosbeaks breeding on the grounds of the Lakeside Laboratory. The narrow fringe of trees along many parts of the lake shore seems to form a typical habitat for this species. I have never found them nesting in the artificial groves of the farmyards, though it may happen, of course. The nest is rather frail, and is usually saddled on a horizontal limb from ten to twenty feet from the ground. The male assists in incubating, and often sings while on the nest.

Length, 8 inches. The male possesses a black and white color pattern, but a conspicuous rose-colored patch marks the white breast; there is also a patch of the same color under the wing. The female is brown and white above, and the white under parts are narrowly streaked with brown. The underwing coverts are orange-yellow. Both sexes have very thick, heavy bills, which are light in color.

106. Indigo Bunting. *Passerina cyanea* (A common summer resident. 10/10)

The Indigo Bunting is a bird of the forest margin, seldom penetrating deeply into the woods. The nest is built in low bushes usually within two feet

110. Grasshopper Sparrow. *Ammodramus savannarum* (A fairly common summer resident. 8/10)

This small sparrow will be found only in the meadows, hiding in the tall grass and weeds. It seldom perches higher than a weed-top, from which it utters its peculiar, insect-like song.

Length, 5.5 inches. It is one of the smaller sparrows. The upper parts have a brown tone color, the breast is buffy, and the belly is whitish. Old birds are not streaked on the breast and sides, but the young birds are. A yellow spot marks the lore and the bend of the wing, which may, or may not be visible as a field mark. The song is a high-pitched, buzzing sound, suggesting an insect.

111. Vesper Sparrow. *Pooecetes gramineus* (A fairly common summer resident. 6/10)

This species inhabits the open fields and prairies, and is frequently seen along the roadside. In general habits the Vesper Sparrow resembles the Lark Sparrow; it is primarily a ground-inhabiting bird, but rises to a fence post or telephone wire to sing.

Length, 6 inches. This is a reddish-brown sparrow of medium size. The tail is almost black, bordered laterally by white, making a very convenient field mark. A cinnamon-colored patch marks the bend of the wing but this is often not distinct enough to serve as a field mark. The breast and sides are well streaked. This plain sparrow has a sweet song which rivals that of the Lark Sparrow.

112. Lark Sparrow. *Chondestes grammacus* (An uncommon summer resident. 2/10)

This species seems to occur only locally, and not in great numbers. In July, 1915, a single one was seen near the south end of Center Lake; one was also seen again in the same vicinity in July, 1918. It may also be well to report that a pair of these birds was noted on July 7, 1914, at Estherville, in Emmet County, Iowa.

Length, 6.25 inches. The upper parts are dark. The tail is bordered laterally and caudally with white. A single black spot marks the center of the white breast. A white line runs through the middle of the crown and above each eye, and the area between the two light lines is of a dark reddish hue, while the ear coverts are of the same color. A faint black line extends laterally from the bill.

This sparrow also inhabits the open fields, but is more likely to be found in pastures where the grass is short. During the mating period the male frequently flies to some elevation and pours out a song which surpasses that of any other sparrow.

113. Chipping Sparrow. *Spizella passerina* (An uncommon summer resident. 5/10)

There are only five records in ten years of this well-known sparrow, which may be given in detail: July 15, 1912, along the shores of Lower Gar Lake; July 25, 1913, in the same vicinity; July 10, 1914, a few miles east of the Upper Gar Lake; July 18, 1919, on the grounds of the Lakeside Laboratory; and August 3, 1921, in the outskirts of the town of Spirit Lake.

The Chipping Sparrow is known to patronize human associations, and should hardly be expected to occur often in the open country, in which most of our field work has been done. It is quite likely that observers in the towns might find the Chipping Sparrow to be more plentiful than is suggested above.

Length, 5.25 inches. The crown is an undivided chestnut color; the forehead is almost black, divided by a short gray line. A whitish superciliary line borders the chestnut crown, and a black line runs through the eye. The under parts are whitish and unmarked. The bill is black.

114. Field Sparrow. *Spizella pusilla* (An uncommon summer resident. 9/10)

This species, while observed nearly every summer, is not by any means generally distributed. One or two individuals have usually been found in the "Loop" of the Little Sioux River, and in the openings south of Center Lake. In 1921 it was seen and heard near Elm Crest and Eagle Point, which was the first time we had noted this bird on the west shore of Lake Okoboji. We may also insert here that the bird was heard in the Des Moines Valley, at Estherville, on June 24, 1928.

Length, 5.5 inches. Upper parts, reddish brown; under parts, dusky. The crown is light chestnut without a median line. The bill is flesh color. The tail is rather long and slender. This sparrow may be recognized unmistakably by its song, which is unique and has great carrying power.

115. Swamp Sparrow. *Melospiza georgiana* (A common summer resident. 9/10)

As its name implies, this sparrow inhabits the dense vegetation of the swamp, and is never seen elsewhere except, possibly, during migration. It may be looked for in any of the larger marshes where there is ample growth of the tall aquatic vegetation, such as *Scirpus*, *Typha*, *Sparganium*, etc. It was always found in the marsh back of the Miller's Bay Hotel and in one or two of the marshes near the West Okoboji railroad station.

Length, 5.75 inches. The upper parts are reddish brown; the sides and flanks are rufous. The throat, breast, and belly are grayish white, but unstreaked. The crown is chestnut, with gray median and superciliary lines. The song of the Swamp Sparrow is a monotonous rattle, not unlike that of the Prairie Marsh Wren, except that it lacks the metallic quality of the latter. This song is usually uttered while the bird is clinging to some swaying reed.

116. Song Sparrow. *Melospiza melodia* (A common summer resident. 10/10)

The Song Sparrow belongs to the forest margin, or rather to a combination of forest margin and water. This combination usually makes for a dense growth of weeds and low shrubbery, which furnishes ample concealment for the activities of these birds. There are many such habitats in the region around the lakes, and the Song Sparrow is a common bird.

Length, 6.25 inches. The upper parts are brownish, mottled with black. The under parts are whitish; the breast and sides are streaked with brown and black, several streaks being coalesced to form a distinct spot in the middle of the breast. The throat is white; three short and more or less parallel dark lines mark the side of the head. The crown is reddish brown, divided by a gray line, and bordered laterally by a dusky superciliary line.

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