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SOME USEFUL BIRDS AND OTHERS  
FOUND IN MINNESOTA  
THEIR ECONOMIC RELATIONS  
TO THE AGRICULTURIST

A Revised Reprint of State Entomologist's Circular 43

By F. L. WASHBURN

DIVISION OF ENTOMOLOGY AND ECONOMIC ZOOLOGY



Myrtle or Yellow-Rumped Warbler

Published by the University of Minnesota, College of Agriculture, Extension Division, F. W. Peck, Director, and distributed in furtherance of the purposes of the co-operative agricultural extension work provided for in the Act of Congress of May 8, 1914.

# USEFUL BIRDS AND OTHERS IN MINNESOTA

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Disregarding any sentimental views caused by their song and beauty, and basing our opinions as to their usefulness or the contrary purely upon a study of their food-habits, it is believed that almost all of our common birds, including many hawks and owls, the so-called "birds of prey," are useful. Some are more so than others, a few are of doubtful utility, and a still smaller number are now regarded as injurious. Further investigations may cause a change of opinion. One has a perfect right to protect his crops from injury by birds, and on occasions a shotgun is justifiable, but one should be absolutely sure that the bird he seeks to destroy is really guilty, that the injury caused is serious, and particularly that the benefits accruing from the destruction of a large number of insects by the bird in question during the nesting season, do not more than compensate for the small amount of fruit or of garden or farm crop destroyed. For this information the agriculturist must rely mainly on experts, as long and careful observations and the examination of a large number of birds' stomachs are necessary to get even approximately accurate facts.

The parent birds obtain the enormous number of insects which form the principal food of the nestlings, as near the nest as possible; the nearer the more trips each day and consequently the more insects consumed. A bird nesting a mile away from a berry patch is not going to cover that distance seeking for insects if it can get them near at hand. Therefore it behooves the agriculturist to encourage birds to nest on his own place.

As evidence of the voracity with which birds attack insects, the writer might cite his observations at Lake Minnetonka in September, 1914, at a time when enormous numbers of "gnats" (Chironomids) filled the air, producing, at sunset and after, a humming noise audible for a long distance. These flies are of no special importance to the agriculturist, but by their immense numbers are sometimes disagreeable accompaniments of a sojourn near a body of water, their larval life being aquatic. In this particular instance, these huge swarms attracted hordes of tree swallows massing for their southward migration. These beautiful birds, thousands of

them, remained in the vicinity of the lake for several days, and must have made a decided impression upon the number of flies. They not only caught these gnats in the air, but clustered upon trees and even on lawns, seeking the flies in places where they had sought shelter from the wind. To determine how great had been the destruction of gnats the writer secured three of the birds and examined their stomachs. These were found distended with immense quantities of flies, but in such condition that anything like an accurate count was impossible. By turning the lens of a camera toward the sky, the accompanying photograph of the swallows was obtained.



Tree Swallows in Enormous Numbers Catching Gnats, Lake Minnetonka

Reference has been made to the raptorial birds, our hawks and owls. The farmer's boy has always felt justified in shooting every hawk and every owl met with, under the impression that he was doing agriculture a good turn. Whenever he could bring down a crow or shoot into a bunch of blackbirds he felt an honest conviction that his action would be approved at home; hence he returns triumphant, proudly displaying his dead crow, or hawk, or

owl as he walks the village street, while the "partridge" or quail or chicken shot out of season is snugly tucked away in the pocket of his hunting coat.

As a matter of fact, most of our hawks and owls are decidedly useful, preying upon rabbits, squirrels, gophers, and field mice. Crows frequently pick up white grubs turned up by the plow. The writer has seen both blackbirds and crows in the stubble eating large numbers of grasshoppers. Both of these are at times injurious in corn fields and in grain, and the poultry raiser, particularly if living near timber, will occasionally have poultry taken by hawks. There are one or two notoriously bad hawks, but the little sparrow hawk is a great eater of grasshoppers, and the marsh hawk, so plentiful about meadows and on the prairie, is a constant hunter of field mice and other animals; while the screech owl is useful on any farm as a mouse killer.

Teachers have an excellent opportunity to inculcate in the minds of their boys a desire to study the habits of birds and to discourage the maiming and killing of song birds or the destruction of their nests and eggs. Usually the small boy who would "make a collection" of birds' eggs wishes to do so because they attract him by their color, partly perhaps by the difficulties involved in securing them, and no doubt he is also influenced by a desire "to collect" which sometimes makes imperative demands upon both young and old. The loss to agriculture by such collections is decidedly great, a loss which is avoidable if the boy's ambitions can be turned into other channels. Egg-collecting without a license, and the killing of song birds are, for the most part, punishable by law, but if the child can be led to observe these laws through an intelligent interest in the birds themselves, the result is better than if fear is the instigating cause. Enough has been said to emphasize the need of a careful and discriminating judgment of birds based upon their food habits before condemning them, and the need of encouraging their continued presence by boxes for wrens, bluebirds, and martins, and by exposing material used in nest building; by winter feeding; and by fostering generally a wise and humane policy towards our feathered associates. The recent enactment by Congress of laws protecting birds during their migration is one of the best evidences of the growth of a higher and at the same time a more practical sentiment in this direction.

## Robin

What would a country home be without robins on the lawn! As a rule, the robin, which is really a thrush, is fairly useful, altho a large per cent of its food is fruit, and it eats many useful beetles. Because of our general attachment to the bird, agriculturists will probably try every possible protective means before having recourse to the shotgun when fruit is to be saved.

Individuals of this species are found frequently very late in the fall, and occasionally where evergreen thickets afford shelter, even in the winter. The writer found them in 1885 on November 9 in Ottertail County. They have been observed in Minnesota, evidently returned from the south, as early as February, but generally they begin to arrive in the latter part of March or early in April, welcome harbingers of spring. Two broods are reared. Beetles constitute a large part of the robin's diet during the summer. Beal (Bul 171, Bur. of Biol. Survey) gives a list of nearly 100 plants the seeds of which have been found in robins' stomachs. Most prominent among them are blueberry, dogwood, woodbine, sumac, blackberry, cherry (domestic and wild), cedar, and mulberry. As most of these seeds pass through the alimentary canal with fertility unimpaired, the robin is a disseminator of these plants. Under certain conditions, robins consume berries and grapes.

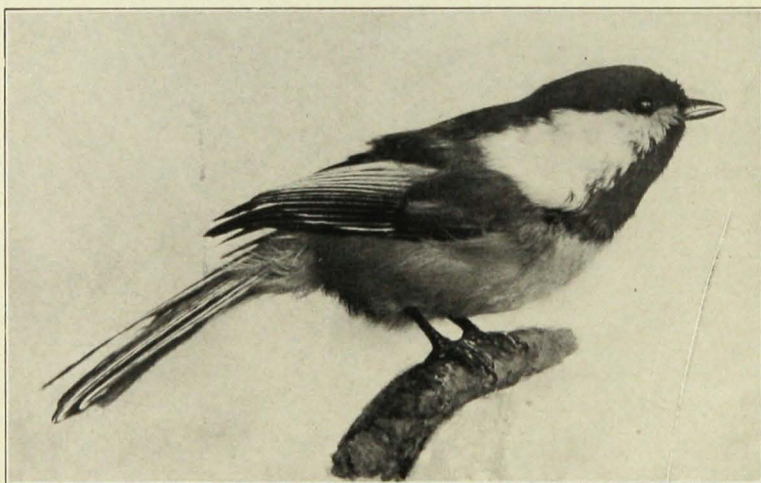
### Yellow-Rumped Warbler; Myrtle Warbler

(See title page)

One of our more common warblers, breeding in the northern part of the state and in Canada and observed in vicinity of Minneapolis about April 15, in small flocks among bushes and other low growth. Its food consists almost entirely of injurious insects, a small percentage only is fruit and seeds. It is particularly fond of scale insects and plant lice, and is something of a fly catcher as well. It is a little more than five inches in length, and can be easily recognized by the presence, in the adult males, of a bright yellow patch on rump, on top of head, and on each side of breast. General colors are grayish with darker stripes, throat white, more or less black on breast and lower parts. In the young and in the adults in late fall, the colors are duller and the characteristic yellow of the crown and rump is either very dim or absent. Nests in evergreens a few feet above the ground; eggs, whitish-gray blotched with brown or blue.

## Chickadee

Found as a resident throughout the northern part of the United States and in Canada and Alaska. Dear to us because of its cheerful activity in winter when almost all other bird friends have left. From an economic standpoint, it is a great benefactor, for not only does it consume large numbers of insects in summer, but more than half the winter food consists of insects and their eggs. The eggs of plant lice make up one-fifth of the entire food; in fact, the destruction of these eggs on fruit and shade trees is the chief beneficial work of this bird in the winter, and the good it does in this way must not be under-estimated. Examinations of the stomachs or crops of these birds have shown that sometimes more than 450 eggs of plant lice are consumed by one bird in one day.



Chickadee

Eggs of canker worms and tent caterpillars are also eaten. Four stomachs or crops examined showed, as the result of a single day's feed, 1028 eggs of canker worms. Four others contained about 600 eggs of canker worms and 105 mature female canker worms. Surely, if any bird deserves protection, it is this one. Such a familiar bird hardly calls for a description. Head, back of neck and throat, black; sides of head and neck, whitish; breast, white; sides, washed with brownish yellow. Length, about five and one-half inches. It nests in old stumps and decayed trees, preferably birch, in holes generally not far from the ground. In addition to its cheerful "chick-a-dee-dee" it has several other notes, some of them extremely musical.

## Screech Owl

Varies greatly in color from rufous, or reddish, to gray. In reddish specimens, reddish above, generally showing fine black lines. Below, whitish, with feathers barred with reddish. Or, in grayish specimens, brownish gray above, with faint black markings mingling with brown. Length, about ten inches. This is a familiar bird about our orchards and barnyards, and as its food habits show, its presence should be encouraged. Of 255 stomachs examined under the direction of the United States Department of Agriculture, one contained poultry; 38 contained other birds; 91 contained mice; 11 contained other mammals; 100 contained insects; 2 contained lizards; 4 contained batrachians; 1 contained fish; 5 contained spiders; 9 contained crawfish; 7 contained miscellaneous matter; 2 contained scorpions; 2 contained earthworms; and 43 were empty.



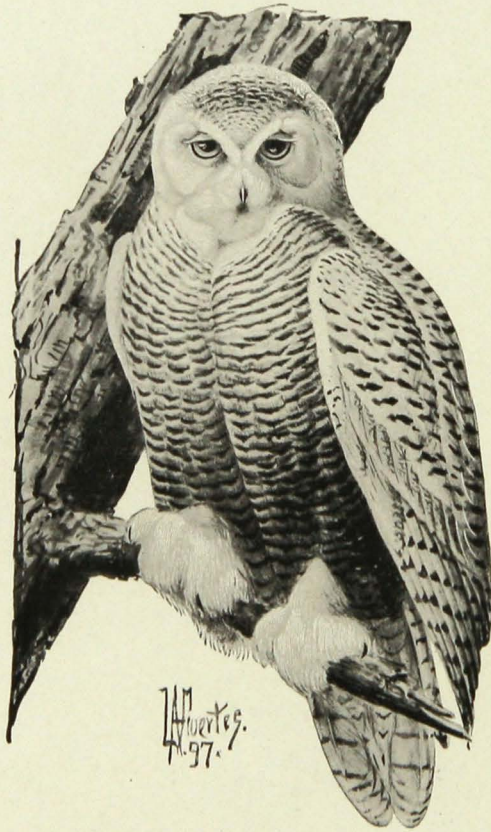
Screech Owls (U. S. Dept. of Agr., Bur. Biol. Survey)

## Snowy Owl and Great Horned Owl

The snowy owl is not common in Minnesota. When seen, it is generally in the winter, when we have occasionally observed it in bare fields. Our field notes, however, show that this bird has been seen occasionally in Ottertail County in October and November. It goes south only in its search for food.

The great horned owl, however, arriving here sometimes as early as February, is a common bird within our state borders.

Rabbits, gophers, muskrats, field mice, and other night-prowling animals constitute a large part of its diet; poultry, too, if allowed to roost outdoors. Even skunks (note illustration) are highly prized for food. With the exception of the skunk, which ordinarily is useful, the animals mentioned must be regarded as injurious—most of them decidedly so; hence this owl is to a large degree a benefactor.



Snowy Owl (After Fuertes)





Great-horned Owl (After Fuertes)

### White-Breasted Nuthatch

The only one of our birds which is commonly seen "climbing" down a tree as well as up. About six inches long, gray with white under part; top of head, black; back, bluish. Ranges over practically the entire United States and Mexico. More than half its food consists of insects. Nests in holes in trees.

This is one of the few birds which remain with us over winter, at which time we frequently find it associating with chickadees, downy woodpeckers, kinglets, and brown creepers. Its rather coarse note frequently repeated has been likened to the word "yank" repeated with a nasal sound. A close cousin of this bird, the red-breasted nuthatch, has a more northerly range. The writer has collected both old and young of the red-breasted nuthatch at St. Vincent in August, and that is perhaps its southern limit in Minnesota.

### Chipping Sparrow; "Chippie"

One of our most common garden birds; unobtrusive, useful, and welcome; easily recognized by its modest grayish and brownish colors and the chestnut or bay patch on top of head. Furthermore, it is very friendly; its somewhat monotonous "chipping" note is a common sound in many gardens and dooryards in this country. It eats seeds in the fall, at which time its colors change somewhat. During the summer, it helps destroy various insects, including caterpillars, beetles, plant lice, etc. Is a little more than five inches long. Nests in trees or vines near house or in garden or orchard; nest generally lined with horsehair; eggs, four or five, bluish, with blackish or brownish markings. It is claimed that in June 93 per cent of its food consists of insects.

### Yellow-Billed Cuckoo

A shy bird with back and long tail brown; under parts, white; lower half of bill, yellow, except at tip. Constructs a loose nest of twigs and lays three, four, or five pale-green eggs, unmarked. This bird is generally silent, but at times utters a note repeated in such a way that it sounds like some one calling the cows. Because this is heard sometimes in lowering weather preceding rain, the bird is called by many "rain crow." Without doubt one of our most useful birds and one of the few which will eat hairy caterpillars such as tent caterpillars and fall web worms. Henshaw (U. S. Dept. of Agr., Farmers' Bulletin 513) reports that one stomach which was examined contained 250 American tent caterpillars; another 217 fall web worms.

The black-billed cuckoo is more common in Minnesota than the yellow-billed.

### Red-Eyed Vireo

Who has not heard and enjoyed the song of this bird in the shade trees along a village street on a hot day in summer? It is heard at a time when other birds are silent, and if one sees the songster among the leaves, he will be found to be actively searching for insects, even while giving voice to his song. The nest is pensile, in a fork, and characteristic in its structure, containing strips of vines, bark of trees, frequently pieces of paper. This nest may be thirty or forty feet above the ground. Eggs, three or four in number, white, the larger end sparingly spotted. The bird is about six and a quarter inches long. Top of head, gray; white line over the eye, which is red. The rest of body olive colored

except under parts, which are white. We found this species to be the most abundant of its family in the Red River Valley some years ago. More than 90 per cent of its food is insects.

### Downy Woodpecker

A true benefactor in that its food consists almost entirely of injurious insects. It is with us both winter and summer. It is the smallest of our woodpeckers, being only six and a half inches long. Black above; a scarlet band on back of neck; white on middle of back; under part, white; central feathers of tail, black; outer ones white with black markings; wings, black spotted with white.



Downy Woodpecker

The female lacks the scarlet patch on back of neck. Nests in holes in trees. Often seen in winter in company with nuthatches, chickadees, and brown creepers. The little vegetable food it eats consists of seeds of poison ivy, sumac, etc. Seventeen Wisconsin specimens had eaten 40 insect larvae, 20 woodboring grubs, 3 caterpillars, 7

ants, 4 beetles, a chrysalid, 110 small bugs, a spider, with a few acorns, small seeds, and a little woody fiber, apparently taken by accident with the grubs. Three-fourths of the food of 140 specimens examined by the Department of Agriculture consisted of insects. Nearly one-fourth consisted of ants, chiefly those which were caring for plant lice, or burrowing in wood.

### **Brown Creeper**

This inconspicuous, active bird being with us throughout the entire year is to be ranked among our most useful assistants in keeping down injurious insects, for it eats many insects in the hibernating stage in winter besides large numbers of insect eggs which would otherwise hatch in the spring. It appears to be always in motion in the daytime, "creeping" over trunks and branches on the lookout for food. General color brown, more or less streaked with lighter colors; white below; about five and one-half inches long; end of tail feathers stiff and pressed against bark of tree after the manner of woodpeckers. Bill slightly curved.

### **Marsh Hawk (Female)**

Male and female quite different, both in size and color. Adult male 19 inches long, grayish above, tail barred with blackish; feathers above at base of tail (upper tail coverts) conspicuously white; breast gray, fading into white on belly, where brownish markings are found. Adult female 22 inches long, dark brown above, marked on head and neck with reddish brown; upper tail coverts conspicuously white as in male; tail darker brown barred with reddish brown; breast buff, the color fading on belly. Nests on the ground in marshes.

This is pre-eminently a bird of the meadows and prairies, and is often seen skimming over the top of the marsh grass hunting its food, at which time the white of the upper tail coverts is conspicuous. It eats field mice, squirrels, rabbits, grasshoppers, frogs, reptiles, and occasionally, but not often, small birds or poultry. The writer regards it as a useful bird to the agriculturist. Out of 124 stomachs examined by the United States Department of Agriculture, 7 contained poultry or game birds; 34 contained other birds; 57 contained mice; 22 contained other mammals; 7 contained reptiles; 2 contained frogs; 14 contained insects; the contents of one were undetermined, and 8 were empty. Dr. B. H. Warren examined 14 stomachs with the following results: Seven

contained only field mice; 3, frogs; 2, small birds (warblers); one, a few feathers, apparently of a sparrow, and fragments of insects; one, a large number of grasshoppers, with a small quantity of hair, evidently of a young rabbit. This bird has been observed in southern Minnesota in January.



Marsh Hawk (U. S. Dept. of Agr., Bur. Biol. Survey)

### Kingbird

This is the policeman of our garden and orchard, bravely attacking large hawks and crows which might be disposed to do mischief. It is a typical flycatcher and consumes an enormous number of insects. It deserves our protection at all times. The few honey bees it takes appear to be mostly drones; examination of 634 stomachs showed only 61 bees in 22 stomachs. Of these 51 were useless drones. On the other hand, it devours robber flies which catch and destroy honey bees. (Biol. Survey Bul. U. S. Dept. of Agr.) Length, eight and one-half inches. Upper parts, dark gray, almost black on head; concealed flame-colored crest on head; under parts, whitish.

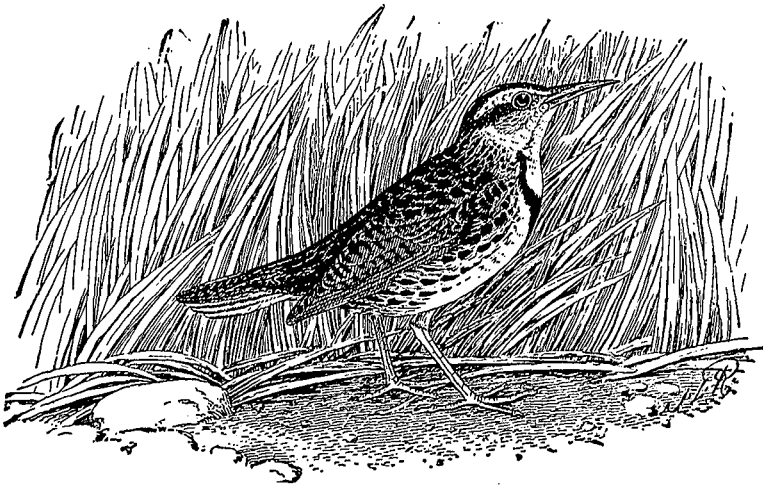
### Sparrow Hawk

Our smallest and most beautiful hawk. Common in fields and along roadsides in late summer and fall, at which time it consumes large numbers of grasshoppers. It also eats other insects, cater-

pillars, spiders, and at least one-quarter of its food consists of field mice, shrews, and field-dwelling house mice. It occasionally preys upon young birds, but this is not a common trait of this species. Quoting from a Biological Survey bulletin: "Out of 410 stomachs examined, 314 were found to contain insects, 129 small mammals, and 70, small birds." We unhesitatingly class this among our useful birds. It is found throughout the United States, breeding wherever it is a summer resident; male about ten inches long; back, brownish red with black bars. Black band at end of reddish tail, the extreme end of which is white. Head bluish with brown shadings. Under parts and sides spotted with black. A hole in a tree is utilized as a nest; eggs, whitish or creamy, 3 to 7 in number.

### Meadow Lark

The meadow lark is common from the Atlantic to the Great Plains, and one variety extends west of the plains to the Pacific coast. It is an inhabitant of both prairie land and fields in districts more or less wooded, and while not a fine songster, in the opinion of many, adds much to our enjoyment of the country.



Meadow Lark (U. S. Dept. of Agr., Bur. Biol. Survey)

The color of the upper parts is a mingling of black, whitish, and chestnut, darker on the head, where we find a light streak running back from the bill; side of head light, showing a yellow streak over and in front of eye; chin, throat, and breast bright yellow, with a jet black collar or cravat on breast in form of a crescent; all but the central tail feathers showing considerable white. Length, 10 to 11 inches. It nests on the ground. Analyses

of stomach contents give interesting results: Two hundred and thirty-eight stomachs examined contained 73 per cent animal matter, and 27 per cent vegetable, the latter being found in the winter. The animal food consisted of insects of ground species—beetles, bugs, grasshoppers, caterpillars, and a few flies, wasps, and spiders. Several of the stomachs taken from birds killed when the ground was largely covered with snow contained a large percentage of insects. Crickets and grasshoppers constitute 29 per cent of the entire year's food, and 69 per cent of the food in August. Twenty-one per cent of beetles was found, of which about one-third were predaceous ground beetles; the others all harmful species. In May caterpillars constitute more than 28 per cent of the whole food, with a large number of cutworms. Grain makes up 14 per cent, and weed and other seeds, 12 per cent.

### Maryland Yellow Throat

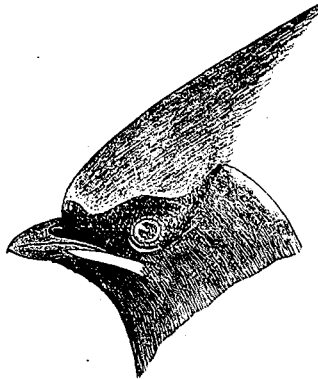
This beautiful warbler is one of the most attractive of the family. It perhaps is not as useful as many others because of its somewhat shy habits and the environment of its nest. It is, nevertheless, thoroly insectivorous, and as such and because of its beauty is entitled to our friendship. The male has a jet black band across forehead and over cheeks; remainder of upper parts and tail, olive green; throat and chest, bright yellow. Nests frequently on the ground; eggs, white, speckled. Found throughout the United States east of the Great Plains. We have found it common in the Red River Valley. It may be regarded as fairly common throughout most of Minnesota, but not conspicuous on account of its retiring habits.

### Cedar Bird; Cedar Waxwing, or "Cherry Bird"

This beautiful bird is about seven inches long, the tips of the secondary feathers in wing and frequently the tail feathers with tips resembling red sealing wax; hence the name. Head and upper parts, warm grayish brown; a conspicuous crest; a jet black line across forehead and through eyes; a yellow band across tail at its end; yellowish below.

It is found in varying abundance over the United States and breeds throughout its range. The nest is characteristic, rather bulky but of loose construction, in which rootlets, moss, twigs, and lichens may appear, and is found in fruit trees or shade trees from six feet to fifteen or more above the ground. Eggs have been described as "putty colored." There may be 3, 4, or 5 in a clutch and irregularly spotted with black or brownish markings. These

birds are fond of canker worms and other caterpillars and are valuable allies in any orchard. One year in August in the Red River Valley a fly-catching habit of this bird was noted and the following notes were made: "For almost half an hour, I watched six of these birds, constantly on the wing, hovering over a slough and catching quantities of (these) insects. They seemed never to grow tired, but flew slowly against the wind, deviating now a little to this side, now to that, until they reached the end of the slough,



Head of Cedar Bird

when back they came to repeat the same maneuver and go over the same ground again and again. Occasionally, they uttered the characteristic note of the species, but, for the most part, flew silently. During the time I stood watching them, they did not once rest." Only 9 out of 152 stomachs of these birds (40 of which were taken in cherry season) contained cultivated cherries, and stomachs of other specimens collected have been found filled with canker worms.

#### **Chestnut-Sided Warbler**

An attractive insect-eating summer resident typical of the large family of warblers, a goodly number of which either pass through Minnesota in spring and fall or nest here. The crown is yellow; sides of breast, chestnut; some greenish yellow in the back of the upper parts; below, white. Length about five inches. It reaches Minnesota about the middle of May.

#### **Crow Blackbird; Purple Grackle**

Eats white grubs, grasshoppers, and other insects, including army worms, but capable of doing damage in grain fields when present in large flocks. At such times a farmer is justified in protecting his crops by the judicious use of the shotgun. But the bird should not be classed as an enemy of the farmer because it



is also known to do good, as indicated. The crow blackbird is 12 inches long. It builds a coarse nest of grass and mud, frequently in evergreens, or even in niches in the cornices of public buildings. We have found them as far north as Ottertail County in the latter part of October. Of 1083 stomachs of the red-winged blackbird examined, weed seed comprised 54.6 per cent of the contents, grain 13.19 per cent, grasshoppers (in August) 17 per cent, caterpillars 20 per cent in March, and beetles 10 per cent. In 138 stomachs of the yellow-headed blackbird, insects comprised 33 per cent of the contents, weed seed 28 per cent, grain 38 per cent.

### Bluebird

Too well known to need detailed description. Found throughout the United States, Canada, Mexico, and parts of Central America. Upper parts, including wings and tail, bright blue; breast, throat, and sides, reddish. Length, 7 inches. Its note is among the first to be heard in the spring, and one of the last in the fall. To the writer, its note in the fall has always appeared to take on additional sadness, as tho lamenting the dying of the year. It nests in hollow trees and in boxes erected in suitable places, and should be encouraged by providing it with plenty of such opportunities for housekeeping. An examination of 205 stomachs showed that 76 per cent of the food consisted of insects and their allies, while 24 per cent-is made up of vegetable substances. Beetles constitute 28 per cent of the whole food; grasshoppers, 22; caterpillars, 11; and various insects, including spiders, comprise the rest. All these insects are more or less harmful, except a few predaceous beetles, which amount to 8 per cent. Prof. S. A. Forbes of Illinois examined 108 specimens secured in every month except November and January, and results of these examinations prove that altho the bluebird eats some insects which are beneficial, and occasionally takes a raspberry or gooseberry, it consumes such an immense number of injurious insects, cutworms, army worms, moths, grasshoppers, and crickets, that it is undoubtedly beneficial. Nestlings of the bluebird, like the young of almost all our common birds, are fed an enormous quantity of insects. These birds have been known to arrive in the vicinity of Minneapolis as early as January, but generally they need not be looked for until late in March. They remain with us until late in October and occasionally into November.

### Blackburnian Warbler

A beautiful representative of the warbler family and a strictly insectivorous bird. Breeding as it does in the evergreen woods, it consumes more insects there than it does in the neighborhood of farms. However, even the warblers that pass through this latitude in spring and again in the fall, not nesting here, are useful, in that they are keen hunters of insects found in our trees at that time. The Blackburnian warbler is hardly to be regarded as common in Minnesota and it seems quite natural in view of its gaudy colors that it should winter in the tropics. It is about five and a quarter inches in length, and the male is strikingly colored. The back is streaked with black and white, and deep orange extends over the chin, throat, and breast; under parts are tinged with the same color. Regarded by many as the most beautiful of all the warblers.

### Rose-Breasted Grosbeak

This beautiful bird and excellent songster is common in almost all parts of Minnesota. The male is at once recognized by the striking black and white coloration and beautiful rose coloring of breast and under side of wings. The female is brownish or olivaceous and in her the rose on the male's wings is replaced by yellow. As the name indicates, the bill is strikingly large and even without the colors would be sufficient to distinguish these birds from other summer bird residents. This species is found breeding as far north as Southern Canada and throughout its range is a help to the agriculturist. It occasionally eats peas and a little fruit, but consumes an enormous number of potato beetles and striped cucumber beetles. It is reputed as attacking scales insects and the writer has seen it foraging for grasshoppers. Canker worms, tent caterpillars, army worms, cutworms, chinch bugs, and others are known to be included in its dietary. This grosbeak is about eight inches long; nests from five to fifteen feet or more from the ground; eggs, 4 or 5, light blue with irregular brownish markings. Reaches Minnesota generally about the first week in May, tho it has been noted here the latter part of April. In the Red River Valley it has been found common in wooded sections.

## House Wren

The house wren, nearly 100 per cent of whose food is insects, reaches Minnesota about April 25.



House Wren (U. S. Dept. of Agr., Bur. Biol. Survey)

## Barn Swallow

The barn swallow captures while on the wing, moths, flies, beetles, and frequently grasshoppers. (House bedbugs, contrary to a very common belief, are not found in swallows' nests.)

## Purple Martin

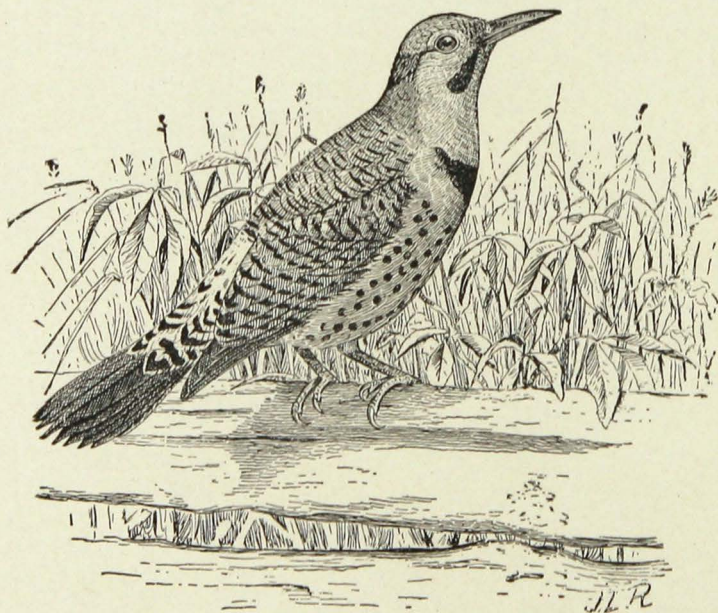
The purple martin, an excellent addition to any farm, should be provided with a martin house and its presence encouraged. It wages relentless war upon hawks and crows and constitutes, therefore, a guard for poultry and small birds. In the writer's notes on Minnesota birds occurs the following entry: "This species, too, occurs about Mille Lacs, where the farmers provide boxes for them. The great majority of them there, however, nest with the gulls on an island called by the Indians "Spirit Island," about two miles from the southeastern shore of Lake Mille Lacs. Here large numbers lay their eggs in the crevices and fissures of the rocks and serve as allies in driving away ravens and other birds disposed to prey upon the eggs and young of the gulls." The bird appears to be growing rarer in Minnesota, owing perhaps to lack of provision in the way of houses. Spirit Island has been made a bird reserve by the federal government.

### Song Sparrow

The song sparrow, so dear to us all, deserves a prominent place on our list; it is not only friendly and attractive because of its song and from the fact that it is one of the earliest of bird arrivals from the south, but it consumes a large amount of weed seed and many insects.

### Yellow-Hammer or Flicker

The flicker, or high hole, is something of a "ground bird"; that is, it is very fond of ants and is quite likely to be discovered dining on ants upon the ground. It eats wood-boring grubs to some extent, but is not as industrious in that direction as many of our other woodpeckers. It occasionally takes a little fruit and is reported to eat grain, tho rarely. On the whole, it is a useful bird, and we are attached to it because we associate its characteristic call with the promising days of early spring before the leaves appear on the trees.



Yellow-Hammer (U. S. Dept. of Agr., Bur. Biol. Survey)

### Ruby-Crowned and Golden-Crowned Kinglets

The ruby-crowned and golden-crowned kinglets, tiny denizens of woodlands, consume large quantities of beetles, bugs, tree-hoppers, scale insects, plant lice, and leaf-hoppers.

## Mourning Dove



Mourning Dove

It is unfortunate that the mourning dove has been so long included among our game birds, as it deserves protection, and we are glad to note that by an act of the Minnesota legislature at its 1915 session it was placed on the constantly protected list. A bulletin from the United States Department of Agriculture (Farmers' Bulletin 513, Bureau of Biological Survey) reports finding in one stomach 7500 seeds of yellow wood sorrel; in another 6400

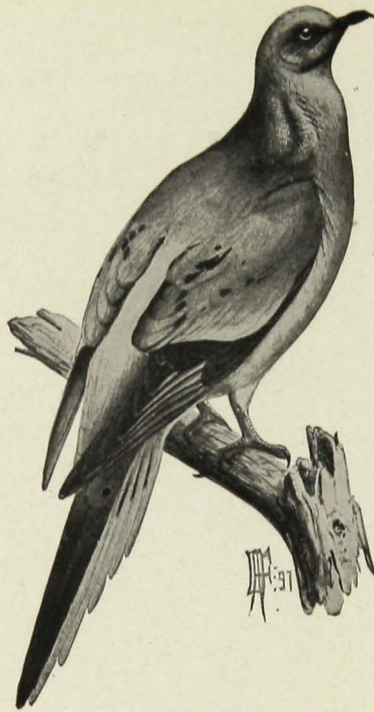
seeds of foxtail, and in a third 2600 seeds of slender pospalum, 4820 seeds of orange hawkweed, 950 of hairy vervain, 120 of Carolina cranesbill, 50 of yellow wood sorrel, 620 of panic grass, and 40 miscellaneous weed seeds.

The drawing is included here for comparison with that of the passenger pigeon or wild pigeon with which the species is sometimes confused.

## Wild Pigeon

A vanished bird. Several reports from various localities in Minnesota have reached the University of the occurrence of this beautiful bird so common years ago, but these rumors appear to have arisen either from confusing the mourning dove with this species, or to have been fakes, pure and simple. So far, the reward of \$1000 for a pair of these birds nesting has not been claimed. The writer was familiar with the appearance of the passenger pigeon when it was extremely abundant in Minnesota and must confess to having been startled a few years ago in traveling by train from Crookston to Bemidji, at catching a momentary glimpse from the car window of two birds in flight among the trees, wonderfully resembling in size, color, and shape, the passenger pigeon of yesterday. No opportunity was afforded, however, to prove this and the idea was dismissed as absurd.<sup>1</sup> The glory of discovering the existence (if it does exist) of this former summer resident still remains for some aspiring ornithologist.

<sup>1</sup>In this connection it may be noted that Francis L. Palmer, of Stillwater, Minn., a student of birds, claims quite emphatically to have observed one of these birds on May 31, 1915, near the town named, which is in the southeastern part of the state. His observations were published in "Bird Lore" for July-August, 1915, page 289.



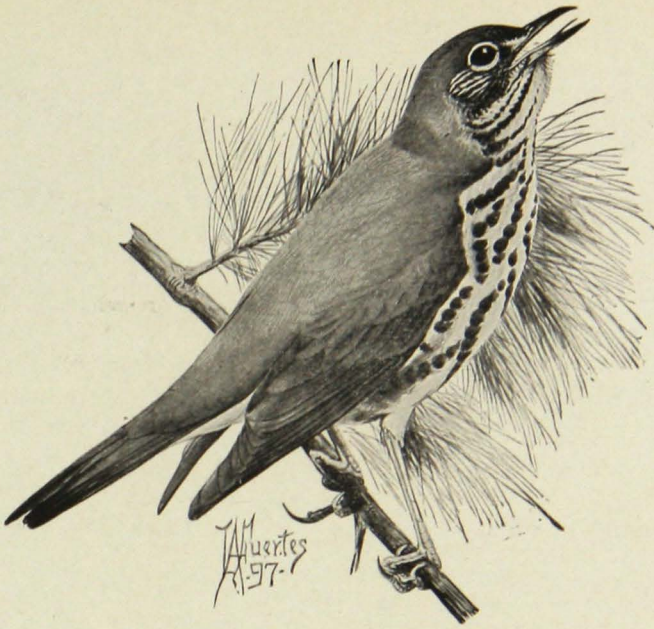
Wild Pigeon

There is no need of confusing these two birds. The wild pigeon is  $16\frac{1}{4}$  inches long; the ground dove only  $11\frac{3}{4}$  inches, approximately. The upper parts of the former are dove-colored or bluish-slate with metallic reflections on the sides of the neck of the male, while the upper parts of the dove are grayish-brown. The nests of both consist of small twigs loosely put together and contain in each case 2 white eggs.

#### Wood Thrush and Wilson Thrush

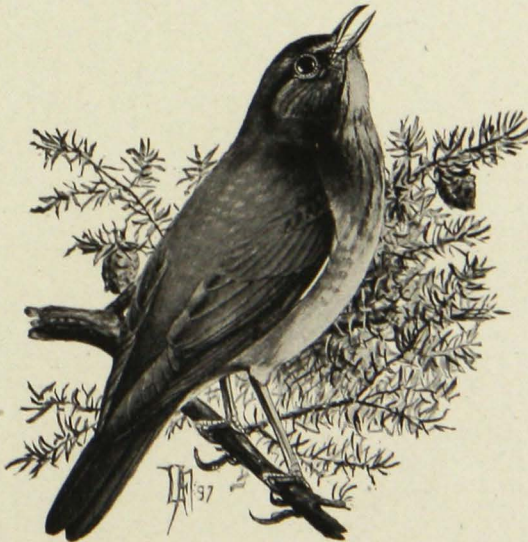
The distinct, sharply-outlined, large, round black spots on the white breast and under parts of the wood thrush, together with its larger size, will at once distinguish it from the Wilson thrush, or veery, with which it vies in the matter of song. In the latter species, the white breast is more or less tinged with cream and dotted with small, somewhat indistinct, brownish, wedge-shaped spots. The upper parts are brownish but not as bright as in the wood thrush.

The first-named bird is  $8\frac{1}{4}$  inches long; the latter (veery) a little over 7 inches. Both lay greenish-blue eggs in a coarse nest similar to the nest of the robin, but the nest of the veery is on or



Wood Thrush

close to the ground. The beautiful song of both these birds, coming from the dense woods, if once heard, is never forgotten and they are both important insect-eaters; in fact, the entire thrush family must be credited with being benefactors of the farmer and



Wilson Thrush

fruit raiser, tho occasional members, notably the robin, may be attracted to berries and fruit. Forbes, after a somewhat exhaustive examination of their food habits, states that 61 per cent of the food of thrushes consists of insects.

### Brown Thrush or Brown Thrasher

The excellent illustration here given is sufficient to enable us to recognize this very common bird of our thickets and fields. Reddish brown above, with black spots on a white ground below, its colors and conspicuously long tail make it a notable object when it seeks a prominent position on a lofty branch, preparatory to singing. Its song, while striking, will not compare, we believe, with that of either the wood thrush or the Wilson thrush or with that of the cat bird. One of its chief charms, perhaps, lies in the fact that it is an accompaniment of the welcome spring weather.



Brown Thrush

While the brown thrush may take a little fruit or grain, it is a good insect eater and, as a ground feeder, scratching among fallen leaves, it picks up many injurious insects, and some useful forms as well, the ground beetles, for example.



## Belted Kingfisher



This picture gives an excellent idea of the appearance of this vivacious, noisy, and at times injurious bird. Naturally a lover of wood-bordered streams and ponds, its noisy rattle is a fit accompaniment to the sound of running water and it is here that it takes frequent toll of fish which might otherwise have lived to fill the angler's creel. Frequently the shot gun is used by the fishbreeder in self-defense; or taking advantage of the bird's habit of frequenting a perch over the water, whence it can see its prey below the surface, a steel trap is placed on an upright pole planted in the pond and the marauder captured. Its white eggs are placed at the end of a long burrow in a bank near the water.

## American Redstart

Fuertes' fine drawing illustrates the male (1) and female (2) of this beautiful bird. One of a large group of wood-warblers, examples of which (Blackburnian, Maryland yellow-throat, chestnut-sided, and yellow-rumped) are shown. The male is striking not only on account of his brilliant coloring but also on account of his conspicuousness, as he is extremely active and this activity coupled with the brilliancy of coloring, makes him an object to catch the eye of even an indifferent observer. As if conscious of

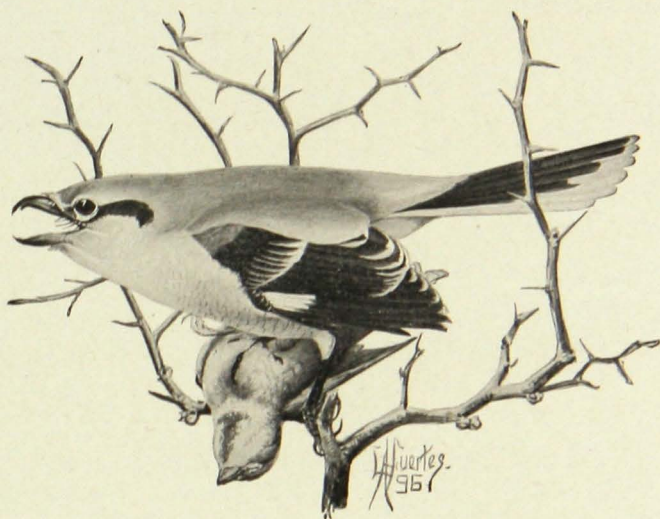
his beauty (breast, head, and back a deep, lustrous black; long wing-feathers at base a rich salmon; about half of the outer tail feathers, sides of breast, and body beneath wings deep salmon) he is continually spreading and flirting his tail, extending his wings, and making short flights from the trees seeking insects, much after the manner of our common fly-catchers. The female is much duller in color, greenish-gray on head and back, and yellowish where the male is salmon.



American Redstart

### Great Northern Shrike; Butcher Bird

A misconception regarding this bird prevails among many, a mistake which is encouraged by its name and perhaps added to, unfortunately, by the illustrations frequently seen, showing the bird with a captured sparrow. It is true, however, that he kills sparrows and other small birds, a fact evidently fully appreciated by his intended victims, since a panic among them is caused by his appearance; but he atones for this by killing and devouring field mice, shrews, and injurious insects. It is to his credit, also, that he is a persistent enemy of the English sparrow—a bird responsible for many ills and now recognized as one means of dispersal of the much dreaded San Jose scale. The Great Northern shrike is common in our fields until late fall, sometimes as late as December in the latitude of Minneapolis, and even later in the southern part of the state, and is recognized by his peculiar flight, close to



Butcher Bird

the ground, by his size and coloration. He is about ten inches long, black, gray, and white. At times, he is something of a songster. Among injurious insects captured are grasshoppers and various caterpillars.

#### American Crossbill

A frequent visitor from the north in the fall and during the winter. More common in the timber and wooded country than in



open sections, tho occasionally seen on some high tree in the center of a large city. Wherever observed in this latitude, it is always tame and easily approached. The writer has found cross-bills in July in the upper Red River Valley, feeding on the insect contents of poplar galls. These were probably young birds, and their occurrence there at that date would indicate the birds breeding at no very great distance.

### Bobolink



This dandy among birds—a favorite of bird lovers and subject of many a song and poem—is a common and welcome summer resident here, filling the fields with drunkn melody, while his more modestly colored mate is sitting quietly on her nest, well hidden in grass or clover. So familiar to all is this songster that with the excellent illustration, no verbal description is necessary.

The beauty and song of the male bird are but transient qualities, for after the breeding season he loses his fine clothes, becomes dull olive-colored streaked with black like the female and young; and in the fall flocks southward to wild rice marshes and cultivated rice fields, wintering in South America. At night one frequently realizes that flocks of these birds are passing by hearing their metallic “Chink” in the darkened sky. As “reed bird”

and "rice-bird," they find their way into the markets of the east and south, fattened by voracious feeding in the rice fields. While with us in the north they eat large numbers of injurious insects.

### Red-Winged Blackbird



However injurious the blackbirds become in late summer and fall, in the spring and early summer they almost or quite pay for their depredations by consuming large numbers of injurious insects. The red-winged blackbird is a welcome arrival in the early spring. At that time, the position taken by the bird in uttering its characteristic note or notes discloses to advantage its scarlet shoulders well set off by glossy black of wings, body, and tail. The grayish-brown female streaked with black we may not notice but the male compels attention.

The United States Department of Agriculture has made an exhaustive study of this bird's food habits and finds that about seven-eighths of its diet consists of harmful insects and weed seeds. Locally when in large flocks, as intimated, it—with others of its tribe—may be very harmful and a resort on the part of the farmer to extreme measures is justified.

## Baltimore Oriole

A flash of flame among the foliage and blossoms of spring. The male oriole and male scarlet tanager are perhaps the most tropical of the birds in Minnesota and the characteristic chattering note of the former is a common and welcome sound in June. Arriving among the last of the birds from the south, it tarries until September before returning to an environment which possibly is more suited to its nature than Minnesota.

The oriole does not lead an altogether blameless life. With the rose-breasted grosbeak, it is guilty of cutting open the pods of green peas and at times is quite destructive in this way. In September it is sometimes a serious menace to ripe grapes, grape-raisers having occasionally to resort to the shotgun to protect their crops.

## Whippoorwill and Night Hawk

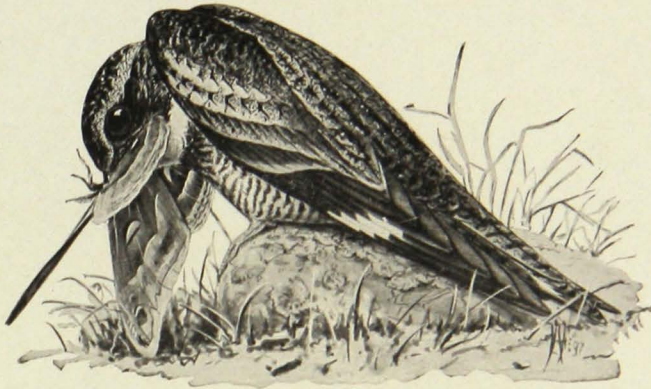
These two birds, sometimes confused by the uninitiated, yet perfectly distinct species, are both insect-eaters and one of them, the whippoorwill, is not often seen and not very well known. It is a bird of the woods, unless disturbed flying only by night, and characterized by its peculiar note, oft-repeated: "Whip-poor-will!" "Whip-poor-will!" "Whip-poor-will" with a "cluck" or "chuck"



Whippoorwill

before each call, audible to one close at hand. This song, quite forceful and penetrating, is heard in the first part of the night and just before dawn. In coloration, the bird harmonizes closely with the wood colors. When flushed, it disappears with absolutely noiseless flight.

The night hawk, on the other hand, is markedly a bird of the open, frequently in flight in the afternoon and early in the evening, high in the air, uttering at frequent intervals his rather harsh cry



Night Hawk

and occasionally, on half-closed wings, darting down to the earth with a booming sound, made, it is claimed, by the rush of air through his primary wing feathers. The two eggs of the night hawk are laid on the ground or in the fields, or even on a flat rock, with no semblance of a nest; occasionally they are found on flat roofs of buildings in cities. The whippoorwill's eggs, also two in number, are laid on the ground or on a log or stump in the woods, likewise protected by no nest. The coloring and markings of the two birds also serve to distinguish them. The whippoorwill's colors partake of the browns, while the night hawk is grayish. The tail of the former has the three outer feathers white for about two-thirds their length. Further, the end of the tail is rounding. The latter-named bird has a conspicuous white patch on each wing; its tail is forked. The whippoorwill feeds largely on moths and beetles; the night hawk on May flies, gnats, dragon flies and grasshoppers.

### The Quail

Among our game birds, the quail gets most of its grain after the crop has been gathered; it eats insects, some of them very injurious. Large numbers of potato beetles and chinch bugs have been found in its crop; army worms, cutworms, and wireworms form a portion of its diet.\* It appears to be growing more abundant in the state from year to year, and farther north each season, yet its occurrence in any latitude in any year naturally depends upon the severity of the preceding winter and upon general climatic conditions.

The Virginia quail or Bob White is holding its own fairly well in Minnesota in spite of the severe winters, pushing its way farther north when conditions are favorable. This bird is such a good



Quail

friend of the agriculturist that it deserves protection, altho its fine qualities as a table bird make it an object of pursuit on the part of hunters. Potato bugs and even chinch bugs have been found in its crop and grasshoppers as well as many other varieties of injurious insects compose a large proportion of its bill of fare.

#### American Woodcock



A somewhat rare bird in Minnesota, frequenting the low, wooded, water-courses and generally resorting to the higher lands

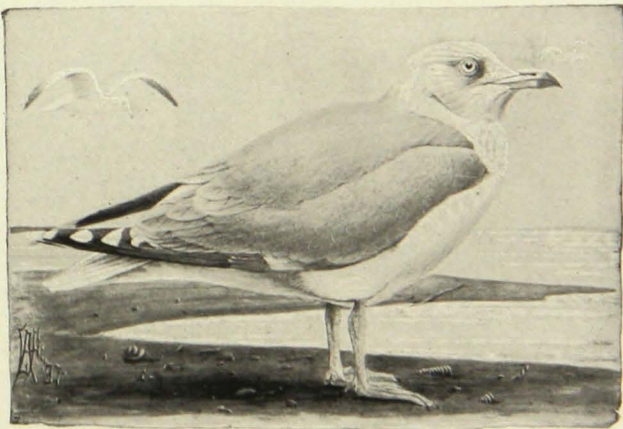


only during the night. This beautiful game bird is pre-eminently a night-flier and a night-feeder. Its large eyes, placed well toward the top of its head, not only gain impressions from above when the bird's soft beak is buried in the mud, but also are in a position to receive all available light. When flushed, the bird rises softly directly upward until clear of the brush and then pauses an instant before starting away from the intruder. The 4 buff-colored eggs, spotted and blotched with brown, are laid on leaves on the ground in an excuse for a nest. This bird has no economic bearing upon agriculture.

### Herring Gull and Common Tern

The gull family is a group beneficial to farmers living in a prairie country.

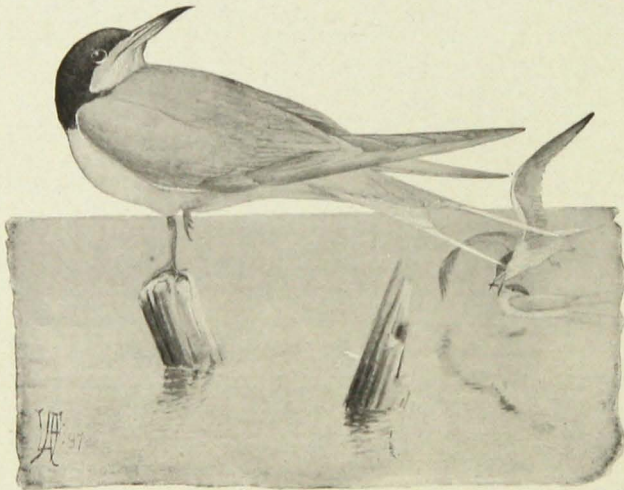
The black tern, found so abundantly about our prairie sloughs, and perhaps the most abundant representative of the group in Minnesota, is a good friend of the farmer, for when the sloughs are dry, and even before, they consume large numbers of grasshoppers. Among others of this family (gulls), Franklin's Rosy gull is one of the chief breeders within the state's borders and is a voracious eater of grasshoppers. While no illustration of this bird is available, an excellent drawing of the common tern will illustrate the group.



Herring Gull

The herring gull—a good scavenger on the shore of lake or ocean, typifies the larger members of the family and the species itself. While not as abundant perhaps as other gulls which breed in some of our lakes, it is nevertheless a Minnesota summer resident, arriving in the southern part of the state early in April, shortly after that working its way north, where some nest in our

larger lakes, notably Lake Mille Lacs. I have observed them at Devils Lake, Ottertail County, in October and also find the following observations among notes taken some years ago: "At Lake Mille Lacs, after the wind has been blowing from the east a day or more, these gulls and *L. delewarensis* and *L. philadelphia*, are plenty along the west shore, flying up and down the beach and occasionally alighting to pick up small lacustrine mollusks washed ashore with the weed matter. About two miles from the south shore of the lake lie three barren, rocky islands, which are frequented by the gulls in the breeding season. The larger of the three, called Stone Island (Spirit Island by the Indians) containing about three-quarters of an acre and with its top about 20 feet above the surface of the water, affords on its rocky surface a nesting place for hundreds of gulls."



Common Tern

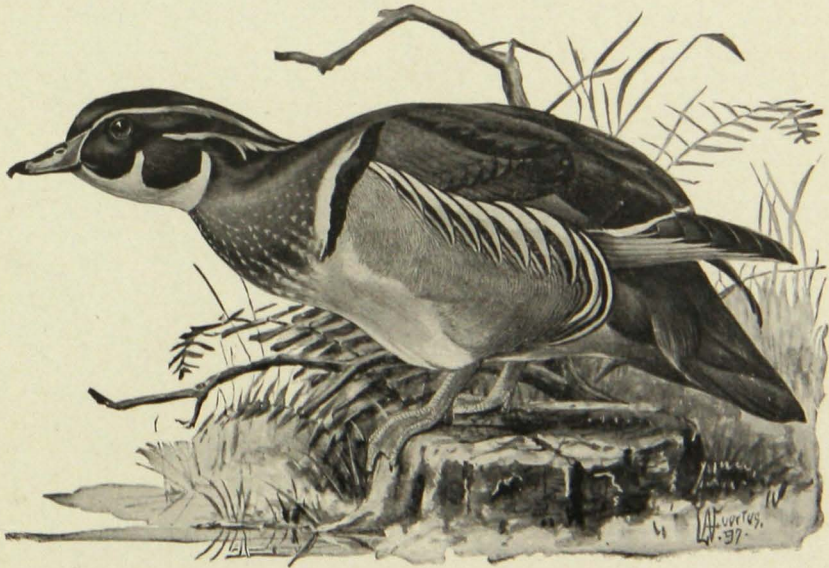
Stomachs of the herring gull are found to contain grasshoppers, fish, mollusks, and in one instance the remains of a marsh hare, probably consumed as carrion. Professor Aughey reported finding in the stomachs of each of four black terns from 47 to 84 grasshoppers or locusts, and in two stomachs examined, from 28 to 59 other insects.

### Wood Duck

A bird like the woodcock and some others, rapidly growing more scarce in Minnesota and included here with the golden plover as representing our "vanishing birds." Strikingly tropical-looking is the male bird. In the excellent illustration imagine the

sides of the face and soft crested crown, green with purplish reflections contrasting sharply with the white of the upper throat; the breast a rich, purplish chestnut, finely spotted with white; sides yellowish, delicately penciled with black; ends of flank feathers sharply barred with black and white. Back blackish or brownish, with green reflections, and long wing feathers, bluish with green reflections. The eye (iris) bright red. A veritable prince among ducks, capable of domestication and worthy of most careful protection.

Dr. P. L. Hatch, in his notes on the birds of Minnesota, 1892, voicing his enthusiasm over this duck, breaks into song as follows: "The most truthful and esthetic description of the mature male could reach no nearer the limning reality than the coldest prose could paint the rainbow. Science, after all her most imposing assumptions, would sit down and weep before the task in black despair. The impotence of all attempts has smirched the skirts of hope by what has been essayed in its systematic as well as its vernacular nomenclature. Aix sponsa! Shades of Linnaeus, weep cold, clammy tears for thine irremedial dereliction! Wood Duck! Summer Duck!"



Wood Duck

Unlike the majority of ducks, these birds breed in hollow trees overhanging the water. They are typically North American, ranging from Florida to Hudson Bay, but wintering far to the south of our most southern borders.

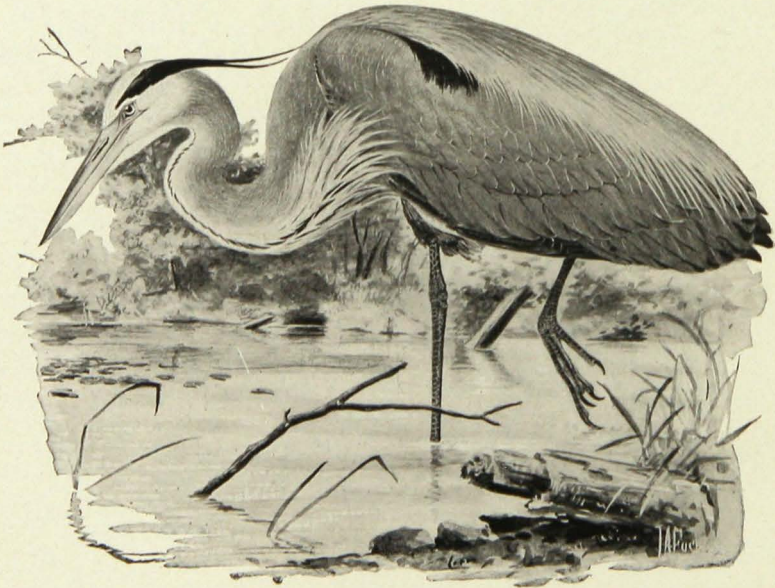
### Golden Plover



A bird also uncommon, as it is here irregularly during the migrations, remaining only a short time, and now, we believe, rapidly disappearing. ~~The illustration given is~~ The killdeer or ringneck plover, common in low-lying fields and frequently seen about the barnyard,<sup>15</sup> easily recognized not only by its rather plaintive note but particularly by the black band across the white breast. It consumes the larvae of many injurious insects found in pastures and meadows; also wireworms, caterpillars, grasshoppers, and crickets, and the eggs of the last two.

While with us, the food of the golden plover consists chiefly of grasshoppers and other insects.

### Blue Heron



Another of our wading birds, wrongly referred to frequently as "crane." The cranes are rather birds of the plains and prairies—not of wooded sections, where we find these fishermen abundantly represented. Its food consists of frogs and fish, but grasshoppers and field mice are not scorned. Like the kingfisher, it may become destructive when frequenting the ponds of the fish-breeder.

## BAD BIRDS

Under this head, we would unhesitatingly place the shark-shinned hawk, Cooper's hawk, and goshawk, the chief marauders against poultry and small birds; the yellow-bellied woodpecker, or "sapsucker," which feeds upon the sap of trees, leaving rows of holes about the trunk; and the English sparrow, or more correctly speaking, the European house sparrow.

### Sapsucker

The sapsucker (the only bad woodpecker we have) preys upon birch, maple, apple, mountain ash, evergreen, and other trees. Some of the cambium or inner layer of bark is eaten also. While this bird eats a few insects, the damage it does in causing trees to bleed, far outweighs the benefits derived from its presence.

This illustration will help one to distinguish between this injurious form and other woodpeckers which are useful. In striking contrast to other birds, whose tongues are extensile for extracting borers from infested trees, the tongue of this species has a somewhat "brushlike" tip. It can not be protruded to any extent, and is thus modified for an entirely different diet from that of other members of the same family. That it seriously injures birch, maple, mountain ash, apple, evergreen, and other trees by girdling them with holes in its seeking for sap and cambium goes without saying. It may and probably does consume a few insects which are attracted to the bleeding holes, but not in sufficient numbers or of the right kind to compensate for the injury inflicted upon the trees. The bird is about eight and one-half inches long. The adult male has crown and throat red, breast black, and belly yellow. The female has no red on throat and the red of the crown is sometimes replaced by black. The downy woodpecker, which is one of our most useful birds, is less than seven inches long and has a scarlet band on the back of the head in the male—not on the crown. On account of its small size and different coloration, it need not be confused with this species.



The Yellow-Bellied Woodpecker or Sapsucker; a Notoriously Bad Bird

### English Sparrow

Farmers are urged to do all they can to eliminate this pest. We have had some success with a sparrow trap, catching from 11 to 25 in a half day. However, this does not occur every day and young birds are most easily caught. Both old and young evidently learn to avoid the trap. Another who has used this trap reports even greater success. Others report a naverage catch of ten birds a day for nearly four months. One can also, if on a farm, resort to shooting them singly or, better, when gathered together feeding. They may be baited with grain for a few days (preferably in the fall or winter) previous to the use of the shotgun. This accustoms them to gathering in a close flock. Eggs and nests may be repeatedly destroyed, if placed within reach. A well-directed stream of water from a hose is helpful in making them desert their roosts, at least for a while.

Dearborn (Farmers' Bulletin No. 493, U. S. Dept. of Agr.) describes nest-box traps. Sparrows may also be poisoned, but this calls for extreme care.

It eats some insects, but its noisy chatter, filthy habits, and pugnacious disposition make it an undesirable bird for any community, and it is probably the most abundant bird over the United States, in country as well as in city.

## BIRDS OF DOUBTFUL UTILITY

### Catbird



Among doubtful birds, we place with reluctance our friend the catbird. Altho having a delightful song, equal to or surpassing that of the brown thrush, it is not of valuable assistance to the gardener or farmer. It eats some insects, but in the latter part of June "these insects were largely replaced by cherries, currants, raspberries, and strawberries. Three-fourths of the food of 11 July catbirds consisted of small fruits, 64 per cent blackberries. Nine per cent of beetles had been taken, most of them being predaceous (beneficial)." (From observations by Forbes of Illinois in "Birds in Their Relation to Man," by Weed & Dearborn.) Four years' study in Minnesota oblige us to take the same attitude. Nevertheless, on account of its song and friendliness and from the fact

that it does consume injurious insects, the cat-bird will doubtless continue to be protected except in cases of particularly flagrant destructiveness.

### Crow and Bluejay

The crow and the various blackbirds will at times call for radical treatment. The writer has seen both crows and blackbirds hunting grasshoppers in stubble fields and both are known to eat other insects, yet their food habits are such as to make their constant protection undesirable, and when necessary the farmer should not hesitate to resort to extreme measures to protect his crop. Crows, it should be noted, eat field mice.

Like the crow, our bluejay sometimes robs nests of both eggs and young birds. However, as he is something of an insect eater, and only occasionally resorts to corn or other grain, it would be hardly just to make war upon him.

### PUBLICATIONS ON BIRDS

Interesting and valuable publications on birds are Chapman's "Bird Life" (not economic) and "Handbook of Birds of Eastern North America" (synoptical and descriptive, very helpful in identification); "Birds in their Relation to Man," by Weed and Dearborn; "Key to North American Birds," by Coues; "North American Birds," by Baird, Brewer, and Ridgway.

The United States Department of Agriculture has issued the following bulletins on birds:

Farmers' Bulletins—

- 493. The English Sparrow as a Pest.
  - 497. Some Common Game, Aquatic, and Rapacious Birds in Relation to Man.
  - 506. Food of Some Well Known Birds.
  - 513. Fifty Common Birds of Farm and Orchard.
  - 609. Bird Houses and How to Build Them.
  - 621. How to Attract Birds in Northeastern United States.
  - 630. Some Common Birds Useful to the Farmer.
  - 755. Common Birds of Southeastern United States in Relation to Agriculture.
- U. S. Dept. of Agr. Bulletin 621. The Crow and Its Relation to Man.

U. S. Dept. of Agr. Yearbook, 1920. Farm Help from the Birds.

Various states and Canada have also issued bulletins on birds, a list of which may be had by writing to the Director of the Experiment Station in these states.



## HOW TO STUDY BIRDS

For one disposed to make a study of birds, a love of field and wood, a few reliable and helpful books, a pair of field glasses (inexpensive ones if necessary), a camera, if one should have the time and inclination towards that phase of the work, are all that are necessary. Observation sheets may be obtained from the Bureau of Biological Survey, at Washington, and this bureau is always glad to receive notes on bird migration and kindred phenomena.

## HOW TO ATTRACT BIRDS

Allowing that birds deserve our protection, one naturally asks, "What can we do to draw them about us?" Trees and shrubbery of course attract them, and McAtee (Farmers' Bulletin 621, Bureau Biological Survey) gives a list of about eighty trees or shrubs, some of which grow in Minnesota, whose fruit affords food for birds.

The establishment of bird refuges and game preserves is doing much to conserve bird life. The artistic bird houses now on the market are a help. An ingenious boy or man can easily construct houses at little expense which answer the requirements very well.

Wren houses should be freed of the preceding year's litter before they can be expected to attract new comers. An entrance to a wren house the size of a silver quarter will admit the wren but keep out the English sparrow. Martin houses should be placed on high poles or in conspicuous places where the martins can see them, not too near trees. A weather-worn martin house, by the way, is apparently more attractive to the birds than a newly painted one.

The Brush Hill Bird Club, of Milton, Mass., has published the following directions relative to the construction of bird houses:

**Bluebird and Tree Swallow.**—Box, 12x6x5 inches; size of hole, 1½ inches; height from ground, 8 to 30 feet.

**Wren and Chickadee.**—Box, 12x5x4 inches; size of hole, 1¼ inches; height, 6 to 25 feet.

**Flicker.**—Box, 15x10x8 inches; hole, 3 to 3½ inches; height, 6 to 25 feet.

**Screech Owl.**—Box, 15x12x12 inches; hole, 3 to 3½ inches; height, 15 feet.

**Martin House Colony.**—Holes, 2 inches; pole, 16 to 20 feet high in open spot where martins can easily see it.

The cover should be detachable so that the box can be easily cleaned.

A sloping top with an overhang is a protection to the young birds from both sun and rain.

Squirrels may be kept out of the boxes by putting a piece of zinc around the hole so that they can not enlarge it by gnawing.

The box should be ventilated.

Poles are preferable to trees for erecting houses, as they afford protection from both cats and squirrels.

Wood is the best material. Tin or earthen boxes should be placed in the shade.

The entrances to bird houses should be on the sheltered side, protected to a certain extent from rain, and it should be borne in mind that too much "meddling" is not relished by birds and that the fewer cats the more birds. It is claimed that one house cat will kill at least 50 birds in a summer in a locality well populated with birds. Shallow receptacles filled with water are very attractive to birds, which appear to be very fond of bathing in warm weather. These can either be made at home or purchased.

### Feeding Birds

In summer, birds generally obtain enough food without special help from man, but in winter, when the natural food is scarce or covered with snow, any provision which we may offer is appreciated. Shrubs, some of which have fruit on their branches all winter, have been referred to. In addition, they may be given suet or meat or grain; and receptacles may be constructed or purchased to hold these foods and protect them from the weather. We have tacked lumps of suet to tree trunks with nails and have been gratified, in snowy weather, at seeing numbers of chickadees, nuthatches, brown creepers, downy woodpeckers, and bluejays avail themselves of food thus offered. If suet is enclosed in wire, waste is prevented.

## HOW TO PROTECT CROPS FROM BIRDS

As man, in clearing and cultivating the land, has removed much of the natural vegetable food of birds, and has frequently replaced it with equally appetizing domestic fruit and vegetables, it is very natural that the birds turn to the cultivated fruit apparently placed within reach for their special benefit. The protection of crops from the attack of birds, therefore, becomes at times a serious problem.

### Protection of Garden Truck

It tries even a bird lover's patience to see garden peas over which he has spent time and labor disappear before his eyes as fast as the pods fill. In our own experience (summer of 1915) orioles were the chief malefactors, tho later the rose-breasted gros-beak developed a fondness for this vegetable. A scarecrow erected near the rows did little good, but white mosquito netting over the

plants proved effective. This netting can be pegged down on each side of the rows so as completely to exclude the birds.

In our own garden this was not done on every row, but it was found that orioles once caught under the netting became so terrified that when finally released they did not again trouble the plants. A friend has suggested the following, much in use in South Africa, where some protection against birds is absolutely necessary: Two stakes are driven into the ground at each end of the row, that is, without striking one or more strands. Apparently this thread is from stake to stake as high as the plant or higher, and close enough together to make it impossible for the birds to fly onto the peas without striking one or more strands. Apparently this thread is not seen and contact with it inspires the same terror as being caught under the netting.

Netting is frequently used to protect strawberries, currants, cherries and other fruit. This method was later tried by the writer, but with little success. Some birds are intimidated by white strings or rags (but not orioles with a fondness for peas) or bright pieces of tin swaying in the breeze. Other means of saving products of the garden will no doubt suggest themselves to the gardener.

#### Protection of Field Crops from Birds and Other Animals

Chief among the enemies of the farmer's cornfield is the crow, and any treatment given the seed to protect it from the attacks of this bird will at the same time afford protection against insects and also reduce the loss from striped squirrels, gophers, and kindred four-footed creatures.

White twine about the edges of a cornfield, strung on high poles, and hung with strips of tin (one about every thirty feet), white rags, etc., is fairly effective in keeping crows away from a planted field. If, in addition to this, a few dead crows are suspended from high poles in different parts of the field, the combination of white twine, bright tin shining in the sun, and the dead crows as a warning to would-be evil doers, works so well that the farmer may rest assured it will be many days before his field is touched by these marauders. This remedy or the twine alone is in quite general use today. A few shots a day for two or three days, in a planted field, go far to secure immunity from attack.

Crows can be poisoned by dissolving ten cents worth of sulphate of strychnine in enough hot water to soak up two quarts of corn. This should be scattered about the field late in the evening so that crows may find it in the early morning.

If scarecrows are used they should be changed occasionally.

Forbush in "Useful Birds and Their Protection," advises the use of a barrel hung on a leaning pole.

One of the safest and best ways of tarring corn and yet not affecting its use in a planter is one originating in Massachusetts. "Put one-fourth to one-half bushel of corn in a half-barrel tub; pour in a pailful of hot water, or as much as is necessary to well cover the corn; dip a stick in gas tar and stir this briskly in the corn; repeat until the corn is entirely black; pour off on to burlap (bran sacks are good); spread in the sun and stir two or three times during the day. If this work is done in the morning and the day is sunny, the corn will be ready for the planter the next day without any other care." A machine will easily handle corn treated in this way. Another way is as follows: "Put corn in fertilizer sack, pour (thinned) tar on corn, tie the sack; let the boys tumble the sack about; add ashes or land plaster; tie sack, tumble some more and it is ready for the planter." The gas tar can be and should be diluted with linseed oil.

If a few crows can be shot at long range, the birds keep away. Even if not hit they seem to realize that it is dangerous ground. Any birds killed should be hung up in the field.

#### ACKNOWLEDGMENT

We are particularly fortunate, through the kindness of the artist, Louis Agassiz Fuertes; of Mabel Osgood Wright; and of the Macmillan Company, publishers of "Citizen Bird," to be able to present here a few of the excellent and accurate illustrations from that publication. It is with the greatest pleasure that we acknowledge our appreciation of the courtesy. Credit for the illustrations by Mr. Fuertes is given in each case.

