UC-NRLF

B 3 319 812

BIOLOGY LIBR.

THE LIBRARY
OF
THE UNIVERSITY
OF CALIFORNIA

Biology Library

BEQUEST OF

Theodore S. Palmer

From

R. O. Williams

Mar. 17, 1926.

**LIBRARY
OF
R. W. WILLIAMS
TALLAHASSEE, FLA.**

Iowa Geological Survey

Bulletin No. 6

THE RAPTORIAL BIRDS OF IOWA

By BERT HEALD BAILEY, M. S., M. D.

"You slay them all! and wherefore?"—*Longfellow.*

GEORGE F. KAY, PH. D. STATE GEOLOGIST,
JAMES H. LEES, PH. D., ASSISTANT STATE GEOLOGIST

DES MOINES

PUBLISHED FOR THE IOWA GEOLOGICAL SURVEY

1918

DES MOINES

ROBERT HENDERSON, *State Printer*

JOHN M. JAMIESON, *State Binder*

Catalogue for Biol. Lib. *as sep.*

*Dec coll
g*

QL 684
I7B3
Biol.
Lib

LETTER OF TRANSMITTAL

IOWA GEOLOGICAL SURVEY.

*To Governor William L. Harding and Members of the
Geological Board:*

Gentlemen: I submit herewith a report on the Hawks and Owls of Iowa with the recommendation that it be published as Bulletin 6 of the Iowa Geological Survey. The author of the report is Dr. Bert Heald Bailey, who was for many years Professor of Zoology in Coe College, Cedar Rapids. Doctor Bailey died on June 22, 1917, before his manuscript had been completed, but, fortunately, his material was in such form that his student and co-worker, Miss Clementina Spencer, was able to edit it and make it available for the people of the state. Miss Spencer cannot be commended too highly for the splendid service she has rendered not alone to the friends of Doctor Bailey, but to all persons who are interested in the subject with which the report deals.

The view which is prevalent among citizens of the state is that hawks and owls and related birds of prey are detrimental to the agricultural and other interests of the state and that, therefore, all of them, without discrimination, should be destroyed. It is by no means generally understood that these birds of prey are the chief destroyers of rodents and insects, many of which are harmful to crop production. The agriculturist should know that with few exceptions hawks and owls are not his foes but his friends, and he should see to it that every effort is made to preserve rather than to destroy them.

In the publication of this Bulletin on Hawks and Owls the Survey feels confident that it is rendering to the people of the state, particularly to the farmers, a service equal to that which has been rendered by Bulletins formerly published by our Survey, among which may be mentioned the Grasses of Iowa, the Weeds of Iowa, and the Rodents of Iowa.

I have the honor to be,

Sincerely yours,

George F. Kay,
State Geologist.

GEOLOGICAL BOARD.

Hon. Wm. L. Harding.....	Governor of Iowa
Hon. Frank S. Shaw.....	Auditor of State
W. A. Jessup.....	President State University of Iowa
Raymond A. Pearson.....	President Iowa State College
S. W. Beyer.....	President Iowa Academy of Science

ADMINISTRATIVE OFFICERS.

George F. Kay.....	State Geologist
James H. Lees.....	Assistant State Geologist
Nellie E. Newman.....	Secretary

CONTENTS.

	Page
Editor's Preface.....	11
Memorial Note of Dr. Bert Heald Bailey.....	15
Bibliography of Doctor Bailey.....	18
Introduction	19
General Information.....	23
Sources of Information and Acknowledgment.....	23
Topography and Distribution.....	34
How to Measure a Bird.....	40
Key to Iowa Birds of Prey.....	40
Key to Iowa Eagles, Hawks, Kites and Falcons.....	41
Key to Iowa Owls.....	43
Notes	44
Descriptions of Iowa Birds of Prey.....	46
Order Raptores. Birds of Prey.....	46
Suborder, Sarcorhamphi. American Vultures.....	46
Family Cathartidæ. American Vultures.....	46
Genus Cathartes.....	46
Cathartes aura septentrionalis. Turkey Vulture.....	46
Suborder Falcones. Vultures, Falcons, Hawks, Buzzards,	
Eagles, Kites, Harriers, etc.....	51
Family Buteonidæ. Hawks, Eagles, Kites, etc.....	51
Genus Elanoides.....	51
Elanoides forficatus. Swallow-tailed Kite.....	51
Genus Ictinia.....	56
Ictinia mississippiensis. Mississippi Kite.....	56
Genus Circus.....	59
Circus hudsonius. Marsh Hawk.....	59
Genus Accipiter.....	69
Accipiter velox. Sharp-shinned Hawk.....	69
Accipiter cooperi. Cooper's hawk.....	74
Genus Astur.....	83
Astur atricapillus atricapillus. Goshawk.....	83
Astur atricapillus striatulus. Western Goshawk.....	88
Genus Parabuteo.....	91
Parabuteo unicinctus harrisi. Harris's Hawk.....	91

	Page
Genus <i>Buteo</i>	93
<i>Buteo borealis borealis</i> . Red-tailed Hawk.....	93
<i>Buteo borealis krideri</i> . Krider's Hawk.....	108
<i>Buteo borealis calurus</i> . Western Red-tail.....	110
<i>Buteo borealis harlani</i> . Harlan's Hawk.....	112
<i>Buteo lineatus lineatus</i> . Red-shouldered Hawk.....	115
<i>Buteo swainsoni</i> . Swainson's Hawk.....	119
<i>Buteo platypterus</i> . Broad-winged Hawk.....	125
<i>Buteo platypterus iowensis</i> . Iowa broad-winged Hawk	130
Genus <i>Asturina</i>	132
<i>Asturina plagiata</i> . Mexican Goshawk.....	132
Genus <i>Archibuteo</i>	133
Subgenus <i>Archibuteo</i>	133
<i>Archibuteo lagopus sancti-johannis</i> . Rough-legged Hawk.....	133
Subgenus <i>Brewsteria</i>	139
<i>Archibuteo ferrugineus</i> . Ferruginous Rough-leg.....	139
Genus <i>Aquila</i>	142
<i>Aquila chrysaetos</i> . Golden Eagle.....	142
Genus <i>Haliaeetus</i>	147
<i>Haliaeetus leucocephalus leucocephalus</i> . Bald Eagle.....	147
Family <i>Falconidæ</i> . Falcons, Caracaras, etc.....	152
Subfamily <i>Falconinæ</i> . Falcons.....	152
Genus <i>Falco</i>	152
<i>Falco mexicanus</i> . Prairie Falcon.....	152
Subgenus <i>Rhynchodon</i>	157
<i>Falco peregrinus anatum</i> . Duck Hawk.....	157
Subgenus <i>Tinnunculus</i>	162
<i>Falco columbarius columbarius</i> . Pigeon Hawk.....	162
<i>Falco columbarius richardsoni</i> . Richardson's Pigeon Hawk.....	167
Subgenus <i>Cerchneis</i>	169
<i>Falco sparverius sparverius</i> . Sparrow Hawk.....	169
Family <i>Pandionidæ</i> . Ospreys.....	175
Genus <i>Pandion</i>	175
<i>Pandion haliaetus carolinensis</i> . Osprey.....	175
Suborder <i>Striges</i> . Owls.....	178
Family <i>Aluconidæ</i> . Barn Owls.....	178
Genus <i>Aluco</i>	178
<i>Aluco pratincola</i> . Barn Owl.....	178

	Page
Family Strigidae. Horned Owls.....	183
Genus Asio.....	183
Asio wilsonianus. Long-eared Owl.....	183
Asio flameus. Short-eared Owl.....	189
Genus Strix.....	194
Strix varia varia. Barred Owl.....	194
Genus Scotiaptex.....	201
Scotiaptex nebulosa nebulosa. Great Gray Owl.....	201
Genus Cryptoglaux.....	203
Cryptoglaux acadica acadica. Saw-whet Owl.....	203
Genus Otus.....	208
Otus asio asio. Screech Owl.....	208
Genus Bubo.....	214
Bubo virginianus virginianus. Great Horned Owl.....	214
Genus Nyctea.....	223
Nyctea nyctea. Snowy Owl.....	223
Genus Surnia.....	228
Surnia ulula caparoch. Hawk Owl.....	228
Genus Speotyto.....	231
Speotyto cunicularia hypogæa. Burrowing Owl.....	231

ILLUSTRATIONS.

Figure.	Page.
1. Portrait of Dr. Bert Heald Bailey.....	14
2. The level Kansan drift plain of northeastern O'Brien county (Lees)	20
3. The rolling prairie of the Kansan drift plain of northeastern Washington county (Alden and Leighton)	21
4. The palisades of the Cedar near Mount Vernon (Norton)	24
5. The deep valley of Mississippi river south of Lansing (Calvin).....	25
6. The flood plain of the Mississippi below McGregor (Calvin)	25
7. A forested glacial ridge (paha) in Bremer county (Norton).....	29
8. A planted grove along the prairie highway in Sac county (Mac- bride)	29
9. The shores and island at Oakwood Park, Clear Lake, Cerro Gor- do county.....	31
10. Dead Man's Lake, a swamp at the south foot of Pilot Knob, Hancock county (Macbride).....	
11. The forest filled valley of Little Sioux river at Sioux Rapids, Buena Vista county (Macbride).....	35
12. The loess hills bounding the Missouri valley north of Turin, Monona county. The flood plain is visible in the distance (Shimek)	
13. Map of Iowa showing life zones.....	39
14. The Turkey Vulture.....	46
15. Map showing the distribution in Iowa of the Turkey Vulture.....	48
16. The Swallow-tailed Kite.....	51
17. Map showing the distribution in Iowa of the Swallow-tailed Kite.....	53
18. The Mississippi Kite, young bird.....	56
19. Map showing the distribution in Iowa of the Mississippi Kite.....	58
20. The Marsh Hawk.....	60
21. Map showing the distribution in Iowa of the Marsh Hawk.....	63
22. The Sharp-shinned Hawk, adult.....	68
23. The sharp-shinned Hawk, juvenile male, with Nuthatch.....	68
24. Map showing the distribution in Iowa of the Sharp-shinned Hawk ..	71
25. Cooper's Hawk, adult.....	74
26. Cooper's Hawk, young female.....	75
27. Map showing the distribution in Iowa of Cooper's Hawk.....	77
28. The Goshawk or Big Blue Hen Hawk.....	82
29. The Goshawk, another view.....	82
30. Map showing the distribution in Iowa of the Goshawk.....	85
31. Map showing the distribution in Iowa of the Western Goshawk ..	88
32. Harris's Hawk (photo by Professor H. R. Dill).....	90
33. Map showing the distribution in Iowa of Harris's Hawk.....	91
34. The Red-tailed Hawk.....	93

Figure.	Page.
35. The Red-tailed Hawk, another view.....	93
36. Map showing the distribution in Iowa of the Red-tailed Hawk.....	99
37. Krider's Hawk.....	108
38. Map showing the distribution in Iowa of Krider's Hawk.....	109
39. Map showing the distribution in Iowa of the Western Red-tail.....	111
40. Harlan's Hawk, or Black Red-tail.....	112
41. Map showing the distribution in Iowa of Harlan's Hawk.....	113
42. The Red-shouldered Hawk.....	115
43. Map showing the distribution in Iowa of the Red-shouldered Hawk	116
44. Map showing the distribution in Iowa of Swainson's Hawk.....	120
45. The Broad-winged Hawk, showing the wing expanse.....	124
46. Another view of the Broad-winged Hawk.....	124
47. Map showing the distribution in Iowa of the Broad-winged Hawk	127
48. Iowa Broad-winged Hawk (photo by Mr. Wesley F. Kubichek).....	130
49. Map showing the distribution in Iowa of the Iowa Broad-winged Hawk.....	131
50. Map showing the distribution in Iowa of the Mexican Goshawk.....	132
51. Rough-legged Hawks, dark phase, male, above, light phase, female, below.....	134
52. Rough-legged Hawk, dark phase.....	135
53. Rough-legged Hawk, light phase.....	136
54. Map showing the distribution in Iowa of the Rough-legged Hawk.....	137
55. Ferruginous Rough-legged Hawk.....	139
56. Map showing the distribution in Iowa of the Ferruginous Rough-legged Hawk.....	141
57. The Golden Eagle.....	142
58. Map showing the distribution in Iowa of the Golden Eagle.....	144
59. The Bald Eagle.....	147
60. Map showing the distribution in Iowa of the Bald Eagle.....	149
61. Map showing the distribution in Iowa of the Prairie Falcon.....	154
62. The Duck Hawk (a live bird photographed by Mr. Alfred Bailey in Louisiana, 1916).....	153
63. The Duck Hawk (from Cory, Birds of Illinois and Wisconsin).....	153
64. Map showing distribution in Iowa of the Duck Hawk.....	159
65. The Pigeon Hawk.....	162
66. Map showing the distribution in Iowa of the Pigeon Hawk.....	164
67. Map showing the distribution in Iowa of Richardson's Pigeon Hawk	168
68. The Sparrow Hawk.....	169
69. Map showing the distribution in Iowa of the Sparrow Hawk.....	171
70. The Osprey (photo by Frank W. Woodruff, Chicago Academy of Sciences)	174
71. The Osprey, another view.....	174
72. Map showing the distribution in Iowa of the Osprey.....	176
73. The Barn Owl.....	178
74. Map showing the distribution in Iowa of the Barn Owl.....	180
75. The Long-eared Owl.....	183

Figure.	Page.
76. Map showing the distribution in Iowa of the Long-eared Owl.....	185
77. The Short-eared Owl.....	189
78. Map showing the distribution in Iowa of the Short-eared Owl.....	191
79. The Barred Owl.....	194
80. Map showing the distribution in Iowa of the Barred Owl.....	196
81. The Great Gray Owl.....	200
82. Map showing the distribution in Iowa of the Great Gray Owl.....	202
83. The Saw-whet Owl.....	203
84. Map showing the distribution in Iowa of the Saw-whet Owl.....	205
85. Screech Owls.....	208
86. Map showing the distribution in Iowa of the Screech Owl.....	210
87. The Great Horned Owl.....	214
88. Map showing the distribution in Iowa of the Great Horned Owl.....	218
89. The Snowy Owl.....	223
90. Map showing the distribution in Iowa of the Snowy Owl.....	225
91. Map showing the distribution in Iowa of the Hawk Owl.....	229
92. The Burrowing Owl.....	231
93. Map showing the distribution in Iowa of the Burrowing Owl.....	234

EDITOR'S PREFACE.

The death of Professor Bert Heald Bailey, M. S., M. D., head of the Department of Zoology and Curator of the Museum in Coe College, occurred on June 22, 1917, just a few days after the commencement at which he was to have received the degree of Doctor of Philosophy from the State University of Iowa. During the year 1916-17 Dr. Bailey held the senior fellowship at the University and was availing himself of a year's leave of absence from Coe College in order that he might finish as a thesis this work on the *Raptorial Birds of Iowa*, a subject which had specially interested him since boyhood. At the same time he had in preparation a similar work on the Mammals of Iowa. About the first of April his work was interrupted by a sudden and mysterious illness which necessitated his return to his home in Cedar Rapids and which terminated fatally eleven weeks later.

A short time before his death Dr. Bailey asked the writer, who was that year acting as his substitute in Coe College, to go to Iowa City and bring back his papers for safe keeping and at that time the promise was made to help him get out this book as soon as he might be able to work upon it.

Doctor Bailey felt that he needed but a few weeks more of uninterrupted time to finish the book. In his hands the different parts of the manuscript would have slipped into their related places as by magic. However, for another person taking up the work there was a greater task involved. Carefully examining every scrap of paper, fearful lest something should be lost, the editor has often been obliged to decide what was to have been included and what was to have been discarded. The introduction, though obviously still in rather rough form, has not been changed, but a few minor parts such as the glossary and the keys to Hawks remained to be written. Some photographs were yet to be made from specimens in the Coe College Museum, and a considerable part of the manuscript was waiting for final copying and arranging. These things are mentioned, not with the desire to take any of the credit for Dr. Bailey's work, but rather that omissions or errors may not be laid to his account. Careful and accurate as he was he would have

instantly detected anything wrong where another might have passed it by.

It will be seen that the bibliographies of the different species do not follow the same plan of arrangement. Those of species 1 to 8 inclusive, and of species 9B and 9C give the synonymy of the authors consulted while the remaining bibliographies, although following the same chronological order, do not give the synonyms under which the birds were described. This change marks the point at which the author's work was interrupted. The writer would gladly have adhered to the author's plan had circumstances permitted her doing so without greatly delaying the appearance of the book, but, lacking the necessary library, the amount of time needed made the advantages of rearrangement appear so slight as to be negligible.

It is of interest to note several contributions which Dr. Bailey has made in his work. A new variety of the Broad-winged Hawk is described, and the first records authenticated by specimens, are made of the Mississippi Kite in Iowa and of the Western Goshawk. Of the last two named species two specimens each have been taken.

Doubtless there are many persons who could have completed and edited this work in better form, but surely no one could have undertaken it more willingly or with a deeper sense of gratitude to one who was for twelve years her honored teacher, fellow-worker and friend.

CLEMENTINA SINCLAIR SPENCER.

COE COLLEGE, JUNE, 1918.

DR. BERT HEALD BAILEY

BERT HEALD BAILEY, M. S., M. D.

MAY 2, 1875—JUNE 22, 1917.

Bert Heald Bailey was born in Farley, Iowa, May 2, 1875, his parents being the Rev. Turner S. Bailey and Helen Gee Bailey. At the age of twelve he came with his parents to live in Cedar Rapids, Iowa, where he attended the public schools, Coe Academy, and later was graduated from Coe College. In 1900 he was graduated from Rush Medical College, and in the same year received the degree of Master of Science from Coe College, his thesis being in the field of Bacteriology. It was Dr. Bailey's great ambition to enter the medical work of Foreign Missions, but at this time it was found that a heart lesion made foreign service impossible, whereupon he assumed the chair of Zoology in Coe College. To his Alma Mater he came with the same enthusiasm and in the same spirit which would have taken him across the seas, and though doing the things which lay close at hand he was still a world citizen, sending others on the journey he had himself hoped to make.

Through intimate first-hand knowledge of the sciences he taught, and a rare sympathetic understanding of his students, Dr. Bailey was a truly great teacher. While giving his especial attention to those looking forward to medicine; he was the friend of all, kind, genial, never too busy to advise and encourage those who were perplexed or disheartened. Hunters, woodsmen, and small boys delighted to gather specimens and data for him and freely came to him in turn for help and information. Scientists throughout the country admired the man and respected his work.

The Museum which Dr. Bailey built up in Coe College is a lasting expression of his wide interests, skill and tireless energy. Although burdened by the many duties which fall to an executive college professor, Dr. Bailey found time to build an educational museum which ranks among the first of the college museums of the United States. To the unorganized though valuable nucleus he found in the college, Dr. Bailey added his own boyhood collection of bird's eggs and skins, and set himself the task of interesting everyone he met in his plan to develop a museum which should afford adequate teaching material for the natural sciences. For years every specimen was prepared by his own hands or by students under

his supervision, then as funds became available he began to secure representative pieces of work from museum technicians in various institutions. In 1905 he made a trip to British Honduras, bringing back a large collection of birds, insects and shells, and the next year he arranged to send two collectors to the same region, with the result that the collection of British Honduras birds ranks as the third largest in the country. In the large series of Iowa birds the splendid collection of Hawks and Owls forms part of the subject material of this thesis. Dr. Bailey was also building up as complete a representation as possible of Iowa mammals, including vanishing species, and was engaged in writing a book upon the Mammals of Iowa. Many other rare and valuable additions to the Museum, both zoological and ethnological were made by the alumni and foreign missionaries with whom Dr. Bailey kept in constant touch, thus forming a link between the college and the religious work of the alumni. It was indeed a world-wide horizon which inspired all his work.

At the entrance to the Museum the alumni have placed a bronze tablet with the following inscription:

THE BERT HEALD BAILEY MUSEUM.

Named in memory of Bert Heald Bailey, M. S., M. D.,
Professor of Zoology and Curator of the Museum in Coe
College, 1900-1917.

Beloved Teacher, Friend and Counselor, Able Scientist, Stal-
wart Christian.

His memory is enshrined in our hearts and in this, the work
of his hands.

CLEMENTINA SPENCER.

THE PUBLICATIONS OF B. H. BAILEY.

It is not certain that the following list is complete, but in addition to these Dr. Bailey furnished many facts for "The Birds of Iowa," by Dr. R. M. Anderson:

The Duck Hawk (*Falco peregrinus anatum*) in Iowa: Proc. Iowa Acad. Science, Vol. X, pp. 93-98, 1902.

Two Hundred Wild Birds of Iowa, Cedar Rapids, 1906.

The Occurrence of Melanism in the Broad-winged Hawk (*Buteo latissimus*): Proc. Iowa Acad. Sci., XIX, pp. 191-192, 1912.

A Remarkable Flight of Broad-winged Hawks: Proc. Iowa Acad. Sci., XIX, pp. 195-196, 1912.

Notes on the Food of the Black-crowned Night Heron in Captivity: Proc. Iowa Acad. Sci., XIX, p. 193, 1912.

Birds of Iowa: Iowa Arbor and Bird Day Book, 1913.

The Building and Function of a College Museum: Proc. Iowa Acad. Sci., XXII, pp. 358-362, 1915.

Notes on the Prairie Spotted Skunk in Iowa: Proc. Iowa Acad. Sci., XXII, pp. 355-357, 1915.

The Mississippi Kite in Nebraska: Wilson Bul., XXVII, pp. 407-408, 1915.

Bird Conservation in Iowa: Proc. of the Iowa Forestry and Conservation Assn., pp. 31, 32, 1914-15.

Science in the High School: The College Eyte, Cedar Falls, May 3, 1916.

Additional Notes on the Little Spotted Skunk (*Spilogala interrupta*): Proc. Iowa Acad. Sci., XXIII, p. 290, 1916.

Successful Mink Farming in Iowa: Proc. Iowa Acad. Sci., XXIII, pp. 285-290, 1916.

Krider's Hawk (*Buteo borealis krideri*) in Alaska: Auk, XXXIII, p. 321, 1916.

Description of a new sub-species of the Broad-winged Hawk: Auk, XXXIV, pp. 73-75, 1917.

Why the Quail Should Be Protected: Des Moines Register, March 28, 1917.

The Western Goshawk in Iowa: Auk, XXXIV, p. 336, 1917.

The Mammals of our State: Iowa Conservation, January-March, 1917, pp. 13-14.

THE RAPTORIAL BIRDS OF IOWA

Introduction.

The aim of this work is to convince the people of Iowa that our Hawks and Owls are a positive asset rather than a liability to the agricultural interests of the state. It would be illuminating, if space permitted, to review the unfortunate experiences of Pennsylvania and Colorado, where bounties were paid on these birds with a view to their extermination. It may suffice to say that the expenditure of tens of thousands of dollars in bounties resulted in the loss of millions of dollars in crops which the unchecked rodents and the insects, the natural food of these birds, subsequently devoured.

A review of the notable series of records by Dr. A. K. Fisher, in his *Hawks and Owls of the United States*, reveals the fact that of the 2,690 stomach records from seventy-three species there listed, only twenty-one are from Iowa birds, five counties being represented by ten different species. Of the 562 stomachs of the Red-tailed Hawk listed by Dr. Fisher there is the report on but a single Iowa specimen, although the Red-tailed Hawk is the most conspicuous of our diurnal birds of prey. In a state whose wealth lies chiefly in its tillable soil, the protection of growing and ripened crops is of first importance. No factor should be omitted in the problem of increasing the output. Accordingly every agency that can be brought to our assistance in the prevention of the annual destruction of seed, or blade, or ripened grain, should be utilized.

The vultures, hawks and owls of Iowa, represented by no less than forty kinds and varieties, are, with the exception of a few species, among the most efficient of all agencies, natural or otherwise, that protect the crops of Iowa. These birds respond aggressively to that primal instinct, the desire for food, and possess a powerful and rapid digestive apparatus which does not allow the appetite long respite. Their swift, sure flight, sharp talons, and strong beaks make them our best allies in our otherwise unsuccessful fight against insect and rodent enemies. The popular opinion that birds of prey are wholly harmful has so firm a hold on the minds of the majority of people that nothing but a demonstration will change that opinion; and it is

to this definite end that the work here undertaken has been addressed.

It was some twenty-five years ago that the writer made the first examinations of the stomach contents of raptorial birds upon which this work is based. The appearance in 1903 of Dr. A. K. Fisher's *Hawks and Owls of the United States*, to which continual reference is herein made, was a very definite stimulus in the keeping of field records, and in the less agreeable though more informing task of examining the stomachs. During succeeding years, as opportunity offered, both dissections and field observations have been made. Birds of prey as a rule are not easily studied in the field, because of

Fig. 2.—The level Kansan drift plain of northeastern O'Brien county (Lees).

their naturally shy or distrustful dispositions. Of the individuals killed relatively few reached the hands of an ornithologist. In consequence the data obtained during a single season or within a year are insufficient as a basis for generalizations concerning a species, a series of years being required for the collection of adequate data. Furthermore, the existing collections of skins of the raptorial birds to be found in even the leading American museums are sadly deficient in data relative to the stomach contents of the birds at the time of preparation, only an occasional bit of information being available from these sources.

Fig. 3.—The rolling prairie of the Kansan drift plain of northeastern Washington county. (Alden and Leighton).

In the year 1904, and again in 1905, a circular letter was directed to various parts of the state, requesting that such hawks and owls as should be shot by hunters, farmers and others, be sent to Coe College, where the contents of the stomachs might be examined. The data thus obtained were of sufficient interest to warrant a compilation of these, together with other findings; and at the suggestion of Dr. G. F. Kay, State Geologist, they have here taken the form of a bulletin of the Iowa Geological Survey. The literature of raptorial birds, particularly such as relates to Iowa, the collections of the various museums, both public and private, and the observations of many friends have all yielded valuable information. The final impetus necessary to the completion of the work was given by the opportunity to spend a year in continuous residence at the State University of Iowa, where Professor C. C. Nutting, head of the Department of Zoology, to whom I am deeply indebted for criticism and direction, placed within easy access the facilities of the University.

GENERAL INFORMATION.

a. The *classification* in the following pages follows that of the American Ornithologists' Union Check-List, 1910, with the exception of a subspecies of the Broad-winged Hawk (*B. platypterus* Vieillot), hitherto undescribed.

b. The *number* appearing at the left of the name of each species is a serial number pertaining to this work alone, the number at the right is the number given to that species or subspecies in the A. O. U. Check-List.

c. The *first common name* is the one generally accepted; if it is followed by others, these are names of more or less local character.

d. The *field characters* are to assist in the identification of the species at a distance, whether by its size, color, flight, feeding habits, or characteristic haunts.

e. The *description* is of use either with the bird in hand or viewed at close range, and gives the general coloration above and below; the italics emphasize special marks of identification.

f. The *measurements* are averages, representing neither maximum nor minimum, but the limits between which most specimens will range.

g. In general, the *range* or distribution given pertains to the United States; in special cases the distribution in Iowa and remarks as to abundance are afterwards noted.

h. The *narrative* deals first with the general habits of the species, after which field observations of the migration, nesting and feeding habits follow.

i. Whenever such data are obtainable, the *records of stomach contents* of birds of prey secured in Iowa, are listed, such records constituting the most dependable evidence of the economic status of each bird in question.

j. The *maps* represent the distribution of the species as actually recorded in ornithological literature, and as observed by dependable naturalists. The maltese cross indicates cases of the occurrence of the bird, and the star instances of its nesting.

k. The *key* is intended to make easy the identification of the hawks and owls of the state.

l. The *illustrations* are for the most part from mounted specimens in the Coe College Museum, due credit being given in each instance when specimens have been found elsewhere.

m. The *bibliography* includes those books consulted by the writer, including many references to Iowa birds of prey compiled by Dr. Paul Bartsch in his thesis, in manuscript, *Literature of Iowa Birds* (1899), marked by an asterisk, and the recent bibliography of

Fig. 4.—The palisades of the Cedar near Mount Vernon (Norton).

Fig. 5.—The deep valley of Mississippi river south of Lansing (Calvin).

Fig. 6.—The flood plain of the Mississippi below McGregor (Calvin).

Dr. T. C. Stephens, of Morningside College, Sioux City, Iowa, marked by a dagger. All references used in the preparation of narratives and distributional maps have been verified by the examination of the original publications.

SOURCES OF INFORMATION AND ACKNOWLEDGMENTS.

While the literature relating to raptorial birds is widely scattered, a few outstanding sources of information deserve special mention. Dr. B. H. Warren, in his *Birds of Pennsylvania*, 1888, deals particularly with the birds of prey from an economic standpoint, giving reports on the contents of many stomachs. The *Life Histories of North American Birds*, 1892, by Captain Charles Bendire, relates the habits of raptorial birds in a manner both interesting and thorough. Dr. A. K. Fisher's *Hawks and Owls of the United States*, 1893, is widely known in ornithological literature, and is a classic in its field. Dr. R. M. Anderson's *Birds of Iowa*, 1907, is the most notable contribution to Iowa ornithology and has proved invaluable as a reference. Certain publications, dealing with the birds of nearby states, have yielded valuable data. Among these are *History of the Birds of Kansas*, 1891, by N. S. Goss; *Birds of Minnesota*, 1892, by Dr. P. L. Hatch; *A Preliminary Catalogue of the Birds of Missouri*, 1907, Otto Widmann; *A Preliminary Review of the Birds of Nebraska*, 1909, by L. Bruner, R. H. Wolcott and M. H. Swenk, and Dr. C. B. Cory's *Birds of Illinois and Wisconsin*, 1912. Dr. Paul Bartsch, at present Curator of Marine Invertebrates in the National Museum, Washington, D. C., in 1899 compiled *The Literature of Iowa Birds*, which is as yet in manuscript form. He has generously permitted me to use this material, and as much of it as relates to birds of prey is included in the bibliography herewith published. Dr. T. C. Stephens, of Morningside College, Sioux City, no less generously placed in my hands bibliographic data relative to the more recent literature of Iowa Raptores.

Dr. T. C. Stephens, Professor H. F. Wickham, Professor J. H. Scott, Dr. F. A. Stromsten, Mr. Dayton Stoner, Professor Charles Reuben Keyes, of Mt. Vernon, and Mrs. B. H. Bailey have generously given their time and by their criticisms and suggestions have assisted in arranging the subject matter of this book. Dr. C. B. Cory, of the Field Museum, Chicago; Mr. Robert Ridgway, and Mr. H. C. Oberholser, of Washington, D. C., have determined the identifica-

Fig. 7.—A forested glacial ridge (paha) in Bremer county (Norton).

Fig. 8.—A planted grove along the prairie highway in Sac county (Macbride).

OAKWOOD PARK
CLEAR LAKE IA
PHOTO BY MENCH

Fig. 9.—The shores and island at Oakwood Park, Clear Lake, Cerro Gordo county.

tion of certain specimens. Mr. N. K. Bigelow very kindly assisted by the examination of many stomachs. I wish furthermore to acknowledge my indebtedness to other friends, notably my assistant of former years, Mr. T. B. Kurata, now of the Museum of Toronto; Miss Clementina Spencer, of Coe College; Mr. George T. McNair, and Mr. Ben H. Peterson, of Cedar Rapids. The acknowledgments due to those who have contributed in various ways to the furtherance of this work are many. I mention again Dr. G. F. Kay and Professor C. C. Nutting, to both of whom I am peculiarly indebted for suggestion and direction. I wish also to acknowledge the kindness of Mr. C. B. Soutter, of Cedar Rapids, who made possible a trip through Northern Iowa in 1902, when much valuable informa-

Fig. 10.—Dead Man's lake, a swamp at the south foot of Pilot Knob, Hancock county (Macbride).

tion was secured, and of Col. William G. Dows, of Cedar Rapids, who likewise has put within easy reach many facilities for the prosecution of this work.

To Professor H. R. Dill, of the State University of Iowa, I am especially obligated for a very considerable portion of the data on stomach contents. Through his kindness all the stomachs of rap-

torial birds brought to his laboratory for a period of years were submitted for examination. I wish also to thank Professor J. H. Paarman and Miss S. G. F. Sheldon, of the Davenport Academy of Sciences; Professor H. W. Norris, of Grinnell; Mr. E. R. Harlan, of the State Historical Museum, Des Moines; Mr. F. C. Pellett, of Atlantic; Mr. Charles Buettner, of Burlington; Mr. G. H. Berry and Mr. John Cobden, of Cedar Rapids; Mr. George Binge, of Mt. Vernon, and Mr. A. F. Porter and Mr. Christ Hoeg, of Decorah.

BERT HEALD BAILEY.

STATE UNIVERSITY OF IOWA, 1917.

TOPOGRAPHY AND DISTRIBUTION.

Few states present a more uniform surface with less topographic relief than Iowa. Planed by successive ice sheets everywhere except in a limited area in the extreme northeast, and drained by the tributaries of two great rivers, there is to be found nothing more bold than a divide whose gentle slopes to the east and west separate the drainage waters of the state, from the Okoboji lakes to near the middle of its Missourian boundary. These eastward trending streams in places have cut through limestone many feet in thickness, making picturesque palisades beautified by the abundant cedars which grow in their crannies or crown their heights. Cottonwood, elm, basswood, oak, and many other trees stand in the flood plains or forest the higher ground almost continuously along their courses. West of the divide there are fewer trees skirting the streams, which flow through the rich alluvial soil. The western and especially the northwestern part of the state, while comparatively treeless, has at present groves that break the monotony of the prairies and that have changed not a little of the fauna inhabiting this section of Iowa. The rugged driftless area north and east of Turkey river is illy adapted to prairie-loving forms, while sections in the north and west afford no attraction to those that require the forest. The wooded Missouri bluffs and bottoms on the west make conditions similar to those found to the east along the Mississippi, and though not so abundant, all the birds of prey common to the Mississippi valley are to be found along the Missouri. The rivers are highways for bird migration, and since so large a part of the raptorial fauna is comprised of species that prefer the woods these are the parts of Iowa where the birds of prey are most abundant. The accompanying chart divides the Hawks and Owls into three groups

Fig. 11.—The forest filled valley of Little Sioux river at Sioux Rapids, Buena Vista county (Macbride).

Fig. 12.—The loess hills bounding the Missouri valley north of Turin, Monona county. The flood plain is visible in the distance (Shimek).

according to their estimated preference for such regions as Iowa affords. It is intended to represent the character of the country, whether timbered or treeless, where the listed species are most frequently found.

* Nesting.

† Permanent resident.

‡ Occasional in winter.

§ Usual every winter.

△ Accidental.

Total of Iowa species 33.

Total of subspecies 7.

Total of species and subspecies 40.

A—Area of greatest abundance Northward, coming south in winter.

B—Area of greatest abundance Eastward, extending westward.

C—Area of greatest abundance Southward, coming north in summer.

D—Area of greatest abundance Westward, extending eastward.

E—Area of greatest abundance Iowa and contiguous states, or as abundant here as elsewhere.

Of these forty, twenty-three have been found nesting in Iowa, six rarely, eight unusually, and nine commonly. Eleven are rare, being accidental stragglers in the state, or if formerly more common, now occasional only.

	Species that prefer Timbered Regions	Species frequenting both Timber and Prairie	Species that prefer Prairie Regions
A	△ Great Gray Owl § Goshawk	△ Hawk Owl	§ Rough-legged Hawk § Snowy Owl
B	* Red Shouldered Hawk * Broad-winged Hawk †* Bald Eagle †* Barred Owl †* Great Horned Owl	†* Sparrow Hawk §* Red-tailed Hawk	
C	△* Swallow-tailed Kite △ Mississippi Kite †* Sharp-shinned Hawk * Cooper's Hawk △ Mexican Goshawk * Barn Owl	†* Turkey Vulture * Harlan's Hawk	
D	△ Western Goshawk △ Harris's Hawk † Western Horned Owl	* Krider's Hawk Western Redtail * Swainson's Hawk △ Ferruginous Rough-leg △ Richardson's Pigeon Hawk Golden Eagle	△ Prairie Falcon * Burrowing Owl
E	* Duck Hawk △ Iowa Broad-winged Hawk * Long-eared Owl Saw-whet Owl †* Screech Owl	* Pigeon Hawk * Fish Hawk	* Marsh Hawk * Short-eared Owl
	Total, 21	Total, 13	Total, 6

The 1910 Check List of the American Ornithologists' Union records 100 species and subspecies of Vultures, Hawks and Owls supposed to occur north of the Mexican boundary in North America and Greenland. Together with a newly-described subspecies (*Buteo platypterus iowensis*) there are 101 all told. Of these three are Vultures, 54 are Hawks and 44 are Owls. In Iowa there have been found of raptorial birds one species of Vulture, 27 species and subspecies of Hawks, and 12 species and subspecies of Owls; a total of 40. Of the entire raptorial fauna of the United States we have therefore about 40 per cent represented, divided as follows: one-third of the Vultures, about one-half of the Hawks, and more than one-fourth of the Owls. Considering the central location of Iowa, and its relatively small relief, it is evident that the Raptores are well

represented. Two factors operate to bring the number of species and subspecies to its present total: *First*, the great changes of temperature, which in summer permit southern species to reach our borders, and in winter bring down the boreal species from the north, and *second*, the intergradations of eastern and western, or even southern forms, which, as in the Red-tailed Hawk, contribute besides the species (*Buteo borealis borealis*) three subspecies (*krikerii*, *calurus*, and *harlanii*).

With the exception of Winnebago and Worth counties, parts of Osceola, Dickinson, Emmet, Kossuth, Hancock, Cerro Gordo, Floyd, Mitchell, Howard, Winneshiek and Allamakee, which are ascribed to the transitional zone, Iowa lies entirely within the Upper Austral zone (4th Provisional Map of the Biological Survey, 1910). The mean temperature approximates 47.5 degrees and the difference in mean temperature between northern and southern Iowa is less than five degrees. The difference between extreme temperature in summer and winter is great, not unusually showing a maximum of nearly +100 degrees in summer and a minimum of -25 degrees in winter.

FIG. 13.—Life zones as given by Merriam. (4th Provisional Map, Biological Survey, 1910.) Shaded area represents Transitional zone, white area represents Upper Austral zone.

Since the identification of Hawks and Owls is rendered difficult by the usual shyness of these birds, the confusing common names given them (such as "Chicken Hawk," which may mean one of three

or four different species) and the fact that a dead specimen comes to hand only occasionally, it seems desirable to furnish a simple key that will aid in identifying the more common species of Hawks and Owls in our state.

HOW TO MEASURE A BIRD.

The total length of a bird (L.) is best obtained by laying the specimen on its back upon a table, gently stretching its head backward. Measure from the tip of the bill to the tip of the longest tail feather.

The stretch of a bird is the distance from tip to tip of the wing feathers.

The tarsus extends from the base or insertion of the toes up to the next joint, which is really the heel of the bird. (The knee of the bird is usually hidden in the feathers.)

The tail is measured from the insertion of the middle feather to the tip of the longest feather.

The wing is measured only from its "bend" to the tip of the longest primary. The "bend" is the one coming nearest to the neck when the wing is folded.

The primaries are the strong flying quills which spring from the end joint, or hand, of the bird's wing.

The length of the bill is taken with dividers along the "culmen," so as to give the distance in a straight line from the feathers at the forehead to the tip of the upper mandible.

KEY TO IOWA BIRDS OF PREY.

- A. Size large. Head naked or covered with short downy feathers; bill rather long and hooked; feet without sharp claws. *Vultures*. One Iowa species. See No. 1, page 46.
- B. Size very large, large, medium or small. Head well feathered; bill short and strongly hooked; eyes set in sides of head and not facing forward. Plumage rather firm. *Eagles, Hawks, Kites and Falcons*. See Key on page 41.
- C. Size large, medium or small. Head well feathered; bill short and strongly hooked; eyes facing forward, each surrounded by a radiating circle of feathers. Plumage more or less soft and fluffy. *Owls*. See Key on page 43.

This key gives one or more characteristics of each species. The *Description* of each species will furnish further points for identifica-

tion. The fact that our Iowa Hawks and Owls are of such various sizes not only among the different species, but among individuals of the same species adds to the difficulty of identifying these birds solely on the basis of size. Female birds average larger than the males.

B.

A KEY TO IOWA EAGLES, HAWKS, KITES AND FALCONS.

1. *Size very large.* Length 33 or more inches.

Tarsus not feathered to base of toes. Adult birds with white head, neck and tail. Young birds without white. Bald Eagle. No. 17.

Tarsus feathered to base of toes. Back of head and neck golden brown. Tail in adult is gray at base; in young is white at base. Golden Eagle. No. 16.

2. *Size large.* Length 17.5 to 25 inches.

Length 19 to 25 inches. Tarsus not feathered to toes. Bright red tail. Circles high in air. Below white with buff on sides of neck and dusky or brownish streaks on belly. (Young birds have no red anywhere, tail is grayish with many dusky bars.) Red-tailed Hawk. No. 9.

Very light above, below white or with a few scattered dusky spots on belly. Krider's Hawk. No. 9-a.

Tail like common Red-tailed Hawk but with evidence of more than one black bar. Body usually darker, tibia with barred flags. Throat often streaked with black. Western Red Tail. No. 9-b.

Very dark though sometimes approaching the common Red Tail. Tail mottled with rusty white, gray and dusky, *never brick red.* Harlan's Hawk. No. 9-c.

Blackish and white. Always near water. Feeds on fish. Osprey. No. 22.

Length 22 to 24 inches. Much rufous in plumage above. Tarsus feathered to toes. Legs rugous barred with black. Ferruginous Rough Leg. No. 15.

Length 21 to 25 inches. Adult: bluish slate with blackish pencilings. Top of head black. Below whitish with small

wavy gray bars. Tail rather long with four dusky bands. Immature: Above dusky grayish with buff edging on feathers. Below whitish with blackish stripes. Seen late in fall, winter and early spring. Goshawk. No. 7.

Length 20 to 23 inches. Tarsus feathered to base of toes. Under parts heavily marked, tending to form a band across belly. Basal part of tail white or buffy. Rough-legged Hawk. No. 14.

Plumage more or less blackish all over. Primaries and tail barred. Dark phase of Rough-legged Hawk. No. 14.

Length 17.50 to 22 inches. Conspicuous reddish shoulder patches. Banded tail. Red-shouldered Hawk. No. 10.

3. *Size medium.*

Length 19.50 to 22 inches. Like a big swallow, tail deeply forked. Body and head white. Wings and tail blackish. Swallow-tailed Kite. No. 2.

Length 19.50 to 22 inches. Slender, *long-tailed* Hawk with white patch on rump in any plumage. Nests on ground near marshes. Marsh Hawk. No. 4.

Length 14 to 20 inches. *Tail rounded at tip.* Bluish gray above. Below whitish with many dusky or rufous bars on sides and breast. Immature: Dusky above with light spots and rusty edges on feathers. Below streaked with brown or dusky. Tail barred with dark bands. Cooper's Hawk. No. 6.

Length 13 to 18 inches. Adult: Dusky brown above, below brownish or dull rusty with many or few transverse white spots. Dark tail with two to four lighter bands. Belly white barred with rufous. Immature: Whitish below with streaks of brown or dusky bands on tail narrow, five to seven. Broad-winged Hawk. No. 12.

Length 16 to 19 inches. Adult: Upper parts slaty blue, primaries barred with ochraceous. Under parts cream buff with spots and bars of black save on breast. Immature: Upper parts dusky with yellowish or rusty edges to feathers, conspicuous black spot below eye. Duck Hawk. No. 19.

4. *Size small, length under 16 inches.*

Length 13 to 15.50 inches. Tail square at tip. Blue gray or lead color, lighter on head and darker on wings and tail.

Rufous spots on primaries. Immature: Back blackish mixed with rufous and white, below buff streaked with rufous and grayish brown, head black and white streaked. Mississippi Kite.

Length 10 to 14 inches. Tail long and *square* at tip with several dusky bars. Wings rounded. Adult: Blue-gray above, darker on head. Below whitish with reddish or dusky bars mostly on breast and sides. Immature: Dusky above with light spots and rusty edges to feathers, below whitish with brown or dusky streaks. Sharp-shinned Hawk. No. 5.

Length 10 to 13 inches. Bluish slate above, broken buffy collar on neck, under parts creamy to ochraceous with dark streaks except on throat. Pigeon Hawk. No. 20.

Length 10 inches. Above bright rufous and black. Much slate blue on wings and head. Sparrow Hawk. No. 21.

C.

A KEY TO IOWA OWLS.

Owls with *Conspicuous Ear Tufts*.

Largest size; length 20 inches or more.

Great Horned Owls.

1. Darker; Great Horned Owl. Common. No. 30.
2. Lighter; Western Horned Owl. Rare. No. 30-B.

Medium size; length more than 13 and less than 16 inches.

Long-eared Owl. Dark colored; ear tufts very long. Common. No. 24.

Smallest size; length less than 12 inches.

Screech Owl. Either red or grey. Very common. No. 29.

Owls with *Inconspicuous* or *No Ear Tufts*.

Largest size; length 19 inches or more.

Length 26 to 28 inches. Great Grey Owl. Eyes yellow. Very rare. No. 27.

Length 22 to 26 inches. Snowy Owl. Feet white. Winter. No. 31.

Length 19 to 22 inches. Barred Owl. Eyes dark. Common. No. 26.

Medium size; length more than 12 and less than 19 inches.

Length 16 to 19 inches. Barn Owl. Buffy speckled; eyes brownish. Not common. No. 23.

Length 14.75 to 17 inches. Hawk Owl. Grayish brown and white. Barred beneath with gray. Tail long. Very rare. No. 32.

Length 14 to 16 inches. Short-eared Owl. Yellowish buff and dusky. Common, especially Fall. No. 25.

Smallest size; length less than 12 inches.

Length 9 to 11 inches. Burrowing Owl. Buffy brown; legs long. Lives in burrows. Rare. No. 33.

Length 7.50 to 8.50 inches. Saw-whet Owl. Brownish, marked with white. Rare. No. 28.

NOTES.

In treating of the birds of prey of any limited territory, such for instance as the state of Iowa, the fact must not be overlooked that species of Raptorial birds that come only occasionally within our borders are nevertheless of considerable value to our state because they destroy injurious mammals, insects, etc., outside our boundaries, thus preventing these pests from extending their range and invading our state. The interrelation of states in this regard should not be overlooked and laws should be made not with relation to state boundaries but with the broader consideration of the distribution of fauna.

In the letter of transmittal written by Dr. C. Hart Merriam in Dr. Fisher's *Hawks and Owls of the United States* the following statement is made which must be astonishing to the majority of people who have hitherto looked upon the birds of prey as one and all worthy of destruction:

"Only six of the 73 species and subspecies of Hawks and Owls of the United States are injurious. Of these, three are so extremely rare they need hardly be considered, and another (the Fish Hawk) is only indirectly injurious, leaving but two (the Sharp-shinned Hawk and Cooper's Hawk) that really need be taken into account as enemies of agriculture. Omitting the six species that feed largely on poultry and game, 2,212 stomachs were examined, of which 56 per cent contained mice and other small mammals, 27 contained insects, and only $3\frac{1}{2}$ per cent poultry or game birds."

At least two species of Raptorial birds listed by J. A. Allen in his catalog of the birds of Iowa published in Appendix B of White's Geology of Iowa, Vol. II, 1870, have not appeared, nor have they been authenticated by collected specimens. Among these are Richardson's Owl and Kirtland's Owl. The former of these will probably be found at length by careful search.

In making the distributional maps I have tried to avoid suppositional records or quotations that leave it uncertain that the species was actually observed by a competent person or that a specimen was collected. Where breeding records are given it is on a similar basis. Occasionally the judgment of the writer is stressed, but the effort has always been to give the facts as nearly as they might be ascertained.

If the Sparrow Hawk or Screech Owl were not only encouraged but propagated they would do more in the way of ridding us of insect pests and other vermin, such as mice, etc., than all the cats in the vicinity.

DESCRIPTIONS OF IOWA BIRDS OF PREY

Order **RAPTORES**. Birds of Prey.

Suborder **Sarcorhamphi**. American Vultures.

Family **CATHARTIDAE**. American Vultures.

Genus **Cathartes** Illiger.

1. *CATHARTES AURA SEPTENTRIONALIS*. Wied. 325.
Turkey Vulture. Turkey Buzzard. Buzzard.

Field Characters.—A large blackish bird with bare reddish head and neck; usually seen sailing with motionless wings, or gathered about some carcass on the ground.

Fig. 14.—The Turkey Vulture.

Description.—Adult: Both sexes with feathers everywhere glossy blackish, more or less brown edged, especially on the upper surface of wings. Head and neck naked, skin red; bill red at base.

Immature: With brownish "fur-like" feathers on head. Nestlings covered with white down.

Measurements.—Length 30 inches, wing 22 inches, tail 11 inches.

Range.—From southern British Columbia, northern Minnesota and southern New York, southward to southern South America. Likely to be found anywhere in Iowa; nesting in suitable localities. Much less common than formerly.

The Turkey Buzzard, as it is popularly called, seems formerly to have been more abundant in Iowa than it now is. At a time when the larger wild animals were here in numbers these birds feasted upon the carcasses of Bison, Deer and Elk which succumbed to disease, accident or the prowess of the hunter, and which were left unburied upon the prairies. J. A. Allen has recorded that hundreds of Turkey Vultures congregated at Panora in 1868, and mentions a locality called "Buzzards Roost" in the southern part of Guthrie county, so named because of the numbers of these birds which resorted there.

The keenness of vision of the Turkey Vulture is unexcelled, and their custom of eating any decaying animal matter, not excepting the dead of their own kind, has caused them to be protected as scavengers in many states.

They are remarkable in flight, soaring at varying levels in the atmosphere without apparent movement of the wings; skimming the tops of hills and dipping into the valleys between, no evident effort being required to gain the hilltop after inspecting the valley.

Though buzzards are not to be considered common, they are to be noticed frequently in some parts of the state and occasionally are found nesting. They are reported to reach Iowa early in April, and by October most of them have moved southward.

Captain Charles Bendire records that Professor Lynds Jones found a nest of the Turkey Buzzard at Grinnell in a hollow stump which had been used by them for many years. Mr. G. H. Berry took an egg of this species from a large hollow stump near Fairfax, Linn county, May 20, 1886. A set of two eggs was taken from a hollow tree at Spirit Lake by Mr. J. W. Preston.

Dr. R. M. Anderson records that E. B. Webster found a pair nesting near Upper Iowa river, and Morton E. Peck says they nested frequently in Black Hawk county.

Mr. George Burge, Professor Charles Keyes and the writer have found their eggs and young at the Palisades on Cedar river near Mount Vernon, where they occupied the small caves and ledges in the more or less vertical limestone cliffs.

A set of two eggs was last taken at this place May 6, 1903, since which time I have no record of their nesting in that vicinity.

The eggs, one or two in number, are creamy white with reddish brown and lilac markings, mostly at the larger end, and measure 2.75 by 1.90 inches.

On one occasion a mother Vulture, in order to drive us from her downy nestling, disgorged partially digested carrion with such protective effect that we were glad to seek purer air at a distance from the nest.

Not infrequently these birds are mistaken for Bald Eagles through the erroneous belief that the head of the Bald Eagle is bare.

Few animals are attacked and killed by the Turkey Vultures, but any carcass will be greedily devoured; mice, fishes and skunks being perhaps the most unusual articles of their recorded diet.

Fig. 15.—Map showing the distribution in Iowa of the Turkey Vulture. In this as in succeeding distributional maps the asterisk denotes nesting records and the maltese cross denotes the occurrence of the bird.

Cathartes Illiger, *Prodromus*, 1811, 236. Type, by subs. design., *Vultur aura* Linnaeus (Vigors 1825).

Cathartes septentrionalis Wied, *Riese Nord-America*, I, 1839, 162. (Near New Harmony, Indiana.)

**Vultur* (*Cathartes* Ill.) *aura*. Say, Thomas, Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., pp. 370, 377, 1819-20. (Engineers Cantonment, Pottawattamie county.)

- *Cathartes aura. Allen, J. A., Notes on the Birds Observed in Western Iowa in the months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, pp. 492-500.
- *Cathartes aura. Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Cathartes aura. Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur and Mahaska counties.)
- *Cathartes aura. Beal, F. E. L., Bird Migration in the Mississippi Valley from Observations Collated by W. W. Cooke: Forest and Stream, Vol. 19, No. 16, p. 306, 1882. (Ames.)
- *Cathartes aura. Jones, Lynds, Ibid. (Grinnell.)
- *Cathartes aura. Berry, H. N.; Vincent, E. F.; Preston, J. W.; Keyes, C. R.; Bond, H. L.; and Clute, W. M., in W. W. Cooke's Bird Migration in the Mississippi Valley, 1884-85. U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 111. (Iowa City.)
- *Cathartes aura. George, F., Ibid. (Williamstown.)
- *Cathartes aura. Jones, Lynds, and Parker, H. W., Ibid., p. 112. (Grinnell.)
- *Cathartes aura. Warren, B. H., Birds of Pennsylvania, p. 72, 1888.
- *Cathartes aura. Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- *Cathartes aura. Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 126, 1888.
- Cathartes aura. Ridgway, R., Ornithology of Illinois: Nat. Hist. Surv. Ill., State Labr. Nat. Hist., Vol. 1, p. 490, 1889.
- Cathartes aura. Goss, N. S., History of the Birds of Kansas, p. 243, 1891.
- *Cathartes aura. Sheldon, Frank W., Brief Notes: Ornithologist and Oologist, Vol. 16, No. 9, p. 129, 1891.
- *Cathartes aura. Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- Cathartes aura. Hatch, Dr. P. L., The Birds of Minnesota: Geol. and Nat. Hist. Surv. Minn., p. 175, 1892.
- Cathartes aura. Bendire, Capt. Chas., Life Histories of North American Birds, Vol. 1, pp. 161-165, 1892.
- *Cathartes aura. Osborn, Herbert, A Partial List of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- *(Cathartes aura.) Preston, J. W., Notes on Bird Flight: The Ornithologist and Oologist, Vol. 17, No. 3, p. 42, 1892.
- *(Cathartes aura.) Trostler, Isador S., A Tramp through Woods and Marshes in Eastern (Western) Iowa: The Oologist, Vol. 14, No. 9, p. 211, 1892.

In the Bibliography following each species the asterisk denotes the bibliography of Dr. Paul Bartsch in his thesis in manuscript, *Literature of Iowa Birds* (1899). The dagger denotes the recent bibliography, unpublished, of Dr. T. C. Stephens of Morningside College, Sioux City.

- **Cathartes aura*. Jones, Lynds, Bird Migration at Grinnell: The Auk, Vol. 12, p. 236, 1895.
- **Cathartes aura*. Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 7.
- *(*Cathartes aura*.) Henning, Carl Fritz, The Red-tailed Hawk (*Buteo borealis*): The Iowa Ornithologist, Vol. 2, No. 3, p. 69, 1896. (Boone.)
- *(*Cathartes aura*.) Audubon, M. R., and Coues, E., Audubon and His Journals, Vol. 1, p. 483, 1897. (Pottawattamie county.)
- *(*Cathartes aura*.) Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 6, 1897.
- *(*Cathartes aura*.) Savage, W. G., Some Notes on the Birds and Weather of Van Buren County, Iowa, March, 1897: The Iowa Ornithologist, Vol. 3, No. 2, p. 27, April, 1897.
- **Cathartes aura*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 1, 1897.
- **Cathartes aura*. Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 54, October, 1897. (Winneshie and Allamakee counties.)
- Cathartes aura*. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Cathartes aura*. Woodruff, R. M., The Birds of the Chicago Area; The Nat. Hist. Survey of the Chicago Acad. Sci., Bull. No. VI, pp. 90-91, 1907.
- Cathartes aura*. Anderson, R. M., Birds of Iowa: Proc. Dav. Acad. Sci., Vol. XI, p. 241, 1907.
- Cathartes aura*. Bruner, L.; Walcott, R. H.; Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 48, 1909.
- Cathartes aura septentrionalis*. Cory, C. B., Birds of Illinois and Wisconsin: Field Mus. of Nat. Hist., p. 449, 1909.
- Cathartes aura septentrionalis*. A. O. U. Check-List, p. 152, 1910.
- Cathartes aura septentrionalis*. Chapman, F. M., Birds of Eastern North America, pp. 286-287, 1914.
- Cathartes aura septentrionalis*. Bunker, C. D., The Birds of Kansas: The Kan. University Sci. Bull., Vol. VII, No. 5, p. 146, 1913.
- †(*Cathartes aura septentrionalis*.) Townsend, Manley P., Turkey Vultures in Northwestern Iowa: Bird Lore, XVI, pp. 270-278, 1914.
- †*Cathartes aura septentrionalis*. Gabrielson, Ira N., Some Marshalltown, Iowa, Notes: The Auk, XXXI, p. 255, 1914.

Suborder **Falcones**. Vultures, Falcons, Hawks, Buzzards, Eagles, Kites, Harriers, etc.

Family **BUTEONIDAE**. Hawks, Eagles, Kites, etc.

Genus *Elanoides* Vieillot.

2. *ELANOIDES FORFICATUS* (Linn.). 327.

Swallow-tailed Kite.

Field Characters.—A long-winged, fork-tailed, black and white Hawk, resembling a big swallow. Unlike any other Iowa bird of prey. Possessed of remarkable powers of flight; feeding while on the wing.

Description.—Head, neck and rump, white. Back, upper surface of wings and entire tail black. Below, white, including under sur-

Fig. 16.—The Swallow-tailed Kite.

face of wings. Tail very deeply forked; outer tail feathers more than twice as long as middle ones.

Immature birds have dark shaft pencilings on feathers of the head.

Measurements.—Length 19.50 to 25.50 inches, wing 15.50 to 17.75 inches, tail 12.50 to 14.50 inches.

Range.—The greater part of North and South America, breeding in suitable localities from northern United States southward. At present rare in Iowa. Formerly bred locally in the state.

This beautiful Kite is unique among the Iowa birds of prey in its noticeable swallow-like form, and the grace of its flight. According to Anderson it was formerly "A tolerably common summer resident throughout the state." His further remark that "it is of infrequent occurrence" is confirmed by observations within the last decade.

It is rarely reported even by trained observers and its description by a novice may easily be recognized.

J. A. Allen in an account written in 1868 speaks of it as "common, often seen in considerable numbers, and generally over or near the timber-skirting streams." He also mentions the nesting of this species near Denison, on Boyer river.

Mr. M. E. Peck has noted it in Black Hawk and Benton counties where his father, Mr. George D. Peck, secured several sets of eggs previous to 1877.

Mr. John Cobden, of Cedar Rapids, once witnessed a flight of Swallow-tailed Kites in that vicinity. The birds were moving in a rather compact body, circling in and out, and coming so close to the top of the hill where he was that "they might easily have been knocked down with long poles." On this occasion they seemed not at all shy, and, as it was autumn, they were moving in a southerly direction.

This Kite not only feeds while on the wing but, like the swallow, drinks while skimming over the surface of the water.

The nest is usually placed at some distance from the trunk, high among the smaller branches of tall trees. It is rather rudely constructed of sticks and twigs with a soft lining of such material as may be obtainable. For this purpose the inner bark of cottonwood trees is sometimes used. The eggs, two or three in number, are white, heavily marked, mostly at the larger end, with rich brownish spots.

It would be interesting to know what have been the factors in reducing the numbers of this particular species in Iowa.

Whether its native shyness during the breeding season, the thinning out of the timber, or the increase of fire-arms has been the most important cause is hard to determine. It can scarcely be at-

tributed to a diminution in either the variety or quantity of its usual food.

Of six specimens reported upon by Dr. Fisher in "Hawks and Owls of the United States," all contained insects, two lizards, and one a tree frog. Three of these birds were from Nebraska and one from Minnesota.

The scarcity of the species in recent years has made impossible the examination of many stomachs of these birds. The variety of insect food devoured by an immature male which was brought to the Coe College Museum, September 20, 1903, as listed below, places this bird beyond all question among the farmer's friends.

Fig. 17.—Map showing the distribution in Iowa of the Swallow-tailed Kite.

Stomach contents of Swallow-tailed Kite, collected September 20, 1903, Cedar Rapids; sex male (immature) :

2 Scarabeus Beetles,	52 Hemiptera,
2 Bumble Bees,	5 Field Crickets,
2 Honey Bees,	44 Grasshoppers,
1 Wasp,	4 Ground Beetles,
1 Burying Beetle,	1 Large Water Beetle,
1 Mole Cricket,	1 Wheel Bug,
1 Cotton Bug,	Also a mass of insect fragments.

The last recorded observation of this bird in Iowa was made by Mr. J. H. Scott, of Iowa City, on Wapsipinicon river near Independence in August, 1912.

- Elanoides Vieillot*, *Nouv. Dict. d'Hist. Nat.* XXIV, 101, 1818. Type, by monotypy, *Falco furcatus* Linnæus=*F. forficatus* Linnæus.
- **Falco* (*Milvus* Bach.) *furcatus*. Say, Thomas, Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, pp. 370, 377. (Pottawattamie county.)
- **Falco furcatus*. Maximilian, Prince zu Wied, *Reise in das Innere Nord Americas*. In den Jahren 1832-34, Vol. 1, p. 340, Coblenz, 1839.
- **Elanoides forficatus*. Maximilian, Prince of Wied, *Travels in the Interior of North America*, p. 134, London, 1843.
- **Nauclerus furcatus*. Allen, J. A., Notes on the Birds Observed in Western Iowa in the months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, p. 500, 1868. (Guthrie county.)
- **Nauclerus furcatus*. Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, I. 424, 1870.
- **Nauclerus furcatus*. Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur.)
- **Nauclerus forficatus* (Linn.) Ridgw. Baird, Brewer and Ridgway, *Birds of North America, Land Birds*, Vol. 3, p. 192, 1874. (Sioux City.)
- **Nauclerus forficatus* (Linn.) Ridgw. Coues, E., *Birds of the North West*, p. 332, 1877. (Cooper.)
- **Elanoides furcatus*. Lester, W. A., *Mississippi Valley Migration: Ornithologist and Oologist*, Vol. 8, No. 5, p. 33, 1883. (Grand View.)
- **Elanoides forficatus*. Coues, E., *Key to North American Birds*, 2d Edition, p. 526, 1884.
- **Elanoides forficatus*, Berry, H. N.; Vincent, E. F.; Preston, J. W.; Keyes, C. R.; Bond, H. L.; and Clute, W. M., in W. W. Cooke's Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 112. (Iowa City.)
- **Elanoides forficatus* (Linn.). Jones, L., and Parker, H. W., *Ibid.*, p. 112. (Grinnell.)
- **Elanoides forficatus*. Ridgway, Robert, *A Manual of North American Birds*, p. 224, 1887.
- Elanoides forficatus*. Coues, E., *Key to North American Birds*, 3 Edition, p. 526, 1887.
- **Elanoides forficatus*. Jones, Lynds, *A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew*, Vol. 1, No. 6, p. 52, Mar., 1889.
- Elanoides forficatus*. Ridgway, R., *Ornithology of Illinois*, p. 444, 1889.
- **Elanoides forficatus* (Linn.). Keyes, Charles Rollin, and Williams, H. S., M. D., *Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences*, Vol. 5, p. 126, 1888.
- **Elanoides forficatus*. Kelsey, Carl, *Birds of Poweshiek County, Iowa: Ornithologist and Oologist*, Vol. 16, p. 132, 1891.

- Elanoides forficatus*. Goss, N. S., History of the Birds of Kansas, p. 247, 1891.
- **Elanoides forficatus*. Coues, E., Key to North American Birds, 4th Edition, p. 526, 1892.
- Elanoides forficatus*. Hatch, Dr. P. L., Birds of Minnesota, p. 176, 1892.
- **Elanoides forficatus* (Linn.). Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Elanoides forficatus*. Bendire, Capt. Chas., Life Histories of North American Birds, p. 168, 1892.
- Elanoides forficatus*. Fisher, A. K., The Hawks and Owls of the United States: U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bull. 3, p. 20, 1893.
- **Elanoides forficatus*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 2.
- **Elanoides forficatus* (Linn.). Stone, Witmer, Birds of Eastern Pennsylvania and New York, p. 85, 1894.
- **Elanoides furcatus*. Jones, Lynds, Bird Migration at Grinnell: The Auk, Vol. 12, p. 120, 1895.
- **Elanoides forficatus*. Godly, A. P., Two Rare Birds in Marshall County, Iowa: Iowa Ornithologist, Vol. 1, No. 2, p. 52, Jan., 1895.
- **Elanoides forficatus*. Searles, W. W., Under Notes and News: The Iowa Ornithologist, Vol. 1, No. 4, p. 90. (Lime Springs.)
- **Elanoides forficatus* (Linn.). Ridgway, Robert, a Manual of North American Birds, 2d Edition, p. 224, 1896.
- **Elanoides forficatus*. Bartsch, Paul, Birds Extinct in Iowa and Those Becoming So: The Iowa Ornithologist, Vol. 2, No. 1, p. 3.
- **Elanoides forficatus*. Henning, Carl Fritz, Under Notes and News: The Iowa Ornithologist, Vol. 2, No. 4, p. 85, 1896. (Boone county.)
- **Elanoides forficatus*. Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 16.
- **Elanoides forficatus*. Audubon, M. R., and Coues, E., Audubon and His Journals, Vol. 1, p. 481, 1897. (Mills county.)
- **Elanoides forficatus*. Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 6, 1897. (Cerro Gordo county.)
- **Elanoides forficatus*. Henning, C. Fritz, The Swallow-tailed Kite: The Osprey, Vol. 1, No. 5, p. 77, 1897. (Boone.)
- Elanoides forficatus*. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Elanoides forficatus*. Anderson, R. M., The Birds of Iowa, p. 242, 1907.
- Elanoides forficatus*. Chapman, F. M., Birds of Eastern North America, p. 290, 1907.
- Elanoides forficatus*. Woodruff, F. M., Birds of the Chicago Area, p. 91, 1907.
- Elanoides forficatus*. Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, pp. 88-89, 1907.

Elanoides forficatus. Cory, C. B., *Birds of Illinois and Wisconsin*, p. 461, 1909.

Elanoides forficatus. Beebe, Mary B., and C. W., *Our Search for a Wilderness*, p. 154, 1910.

Elanoides forficatus. Bruner, L.; Wolcott, R. H.; Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 50, 1909.

Elanoides forficatus. Bunker, C. D., *The Birds of Kansas*, p. 146, 1913.

Fig. 18.—The Mississippi Kite, young bird.

Genus *Ictinia* Vieillot

3. *ICTINIA MISSISSIPPIENSIS* (Wilson). 329.

Mississippi Kite.

Field Characters.—A rather small, *slaty blue*, or *lead-colored* Kite, with *black tail*. Immature birds have *streaked heads*, *dark*

backs and white-barred tails, and are heavily streaked with dusky below. An easy flying bird, migrating in flocks, sometimes at a great height.

Description.—Adults: On both neck and head grayish above; back slate colored; tips of wings and entire tail black. Below grayish.

Immature: Streaked on the head with black and white; back dusky with rufous edged feathers; tail with three or four incomplete white bars. Below heavily streaked with blackish brown on a buffy background.

Measurements.—Length 13 to 15.50 inches, wing 10.60 to 12.30 inches, tail 6 to 7 inches.

Range.—Southern Kansas, Iowa, Illinois, southern Indiana and South Carolina, south to Texas and Florida; wintering in Florida, southern Texas, and beyond. Accidental in Colorado, South Dakota, Nebraska, Wisconsin and Pennsylvania.

This Kite is by no means the equal in elegance and beauty of the Swallow-tailed Kite, but is said to share with it remarkable powers of flight.

R. M. Anderson says: "I was for a long time constrained to place it in the hypothetical list for want of a definite authentic record of its capture in Iowa."

Two specimens of the Mississippi Kite were secured in the fall of 1887 near Burlington. They were mounted by Mr. Chas. Buettner, of that city, and were examined by the writer in the museum of the Iowa Wesleyan University at Mount Pleasant. This is its first recorded occurrence in the state.

An immature female Mississippi Kite collected near Omaha, Nebraska, and purchased for the Coe College Museum, is the first of this species recorded for Nebraska. (The Wilson Bulletin, September, 1915.)

This Kite is said to be fully as gregarious as any of the other Kites and oftentimes may be seen in flocks of twenty or more circling over a favorite hunting ground. It is also said to be not at all shy, and Col. N. S. Goss, in his History of the Birds of Kansas, relates that at one time he shot two of these birds from the same tree, the second one remaining in the tree undisturbed by the discharge of the gun which killed its mate.

There is no record of its nesting in Iowa. The eggs are from one

to three, dull whitish or bluish white, measuring about 1.63 by 1.32 inches.

Authors generally state that the food of this species is similar to that of the Swallow-tailed Kite, with which it is said to be seen not infrequently.

Fig. 19.—Map showing the distribution in Iowa of the Mississippi Kite.

Ictinia Vieillot, Analyse, 24, 1816. Type, by monotypy, *Milvus cenchris* Vieillot=*Falco plumbeus* Gmelin.

Falco mississippiensis Wilson, Amer. Orn., III, 80, pl. 25, fig. 1, 1811. (A few miles below Natchez, Mississippi.)

Ictinia mississippiensis (Wils.)

**Falco mississippiensis* Wilson. Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie county.)

**Ictinia mississippiensis* Gray. Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

**Ictinia mississippiensis* (Wilson). Baird, Brewer and Ridgway, History of the Birds of North America, Land Birds, Vol. 3, p. 204, 1874.

**Ictinia subcoerulea*. Coues, E., Key to North American Birds, 2d Edition, p. 525, 1884.

Ictinia mississippiensis (Wilson). A. O. U. Check-List, p. 185, 1886.

**Ictinia mississippiensis* (Wilson). Ridgway, Robert, A Manual to North American Birds, p. 225, 1887.

**Ictinia subcoerulea*. Coues, E., Key to North American Birds, 3d Edition, p. 525, 1887.

- **Ictinia mississippiensis* (Wilson). Ridgway, Robert, Natural History Survey of Illinois, Vol. 1, p. 448, 1889.
- Ictinia mississippiensis*. Goss, N. S., History of the Birds of Kansas, p. 250, 1891.
- Ictinia mississippiensis* (Wilson). Bendire, Chas., Life History of the North American Birds, Vol. 1, p. 177, 1892.
- **Ictinia subcoerulea*. Coues, E., Key to North American Birds, 4th Edition, p. 525, 1892.
- **Ictinia mississippiensis*. Fisher, A. K., The Hawks and Owls of the United States: U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bull. 3, p. 24, 1893.
- **Ictinia mississippiensis* (Wilson). Ridgway, Robert, in C. C. Nutting's Report of the Committee on State Fauna: Proceedings of the Iowa Academy of Science for 1892. Vol. 1, Part 3, p. 41, 1893.
- **Ictinia mississippiensis* (Wilson). Ridgway, Robert, Ibid., Reprint, p. 2.
- **Ictinia mississippiensis* (Wilson). A. O. U. Check-List, 2d Edition, p. 127, 1895.
- **Ictinia mississippiensis* (Wilson). Ridgway, Robert, A Manual to North American Birds, 2d Edition, p. 225, 1895.
- **Ictinia mississippiensis*. Bartsch, Paul, Birds Extinct in Iowa and Those Becoming So: The Iowa Ornithologist, Vol. 2, No. 1, p. 3, 1896.
- **Ictinia mississippiensis*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 2, 1897.
- Ictinia mississippiensis* (Wilson). Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Acad. Sci. of St. Louis, p. 90, 1907.
- Ictinia mississippiensis* (Wilson). Anderson, R. M., The Birds of Iowa: Proc. Dav. Acad. Nat. Sci., Vol. XI, p. 243, 1907.
- Ictinia mississippiensis* (Wilson). Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 50, 1909.
- Ictinia mississippiensis* (Wilson). Cory, C. B., Birds of Illinois and Wisconsin, p. 454, 1909.
- Ictinia mississippiensis* (Wilson). A. O. U. Check-List, p. 154, 1910.
- Ictinia mississippiensis* (Wilson). Chapman, F. M., Birds of Eastern North America, p. 291, 1912.
- Ictinia mississippiensis* (Wilson). Bunker, C. D., The Birds of Kansas, p. 146, 1913.
- Ictinia mississippiensis* (Wilson). Bailey, B. H., The Wilson Bulletin, No. 92, September, 1915.

Genus *Circus* Lacepede.

4. *CIRCUS HUDSONIUS* (Linnaeus). 331.

Marsh Hawk. Harrier. Blue Hawk.

Field Characters.—A moderately large, slender, long-tailed hawk usually seen flying low over meadows or marshes, perching on fence

Fig. 20.—The Marsh Hawk.

posts or on the ground, the distinguishing mark in any plumage being a patch of *white feathers above the base of the tail*. Adult males are of a general ashy bluish color; female and immature birds are dark colored with streaks of dusky and buff, the latter with much dull red beneath.

Description.—A noticeable ruff of radiating feathers about the eyes much as in the owls. Adult male, above ashy or grayish ash; upper tail coverts conspicuously white; tail barred with six to eight dusky

bands. Below, pearl grayish on forebreast. White elsewhere below with rufous markings.

Adult female, above dusky with streaks on head and neck and reddish edgings to feathers on upper surface of wings. A white patch at base of tail above as in the male. Tail heavily barred with buff and black. Below, yellowish buff with heavy darker streaks.

Immature birds are darker above than the female, and with dull reddish or buffy rufous underparts. The white patch above the base of the tail is especially conspicuous in this plumage. The plumage is rather loose and soft, suggesting that of an owl.

Measurements.—Length, 19 to 22 inches; wing, 13.75 to 15 inches; tail, 9 to 10 inches.

Range.—North America in general; south to Panama and Cuba. Breeds throughout its North American range. (A. O. U. Checklist, 1910.)

This slender-legged, long-tailed hawk is characteristically a bird of the open prairie and marsh land. I have never seen it in heavy timber, though it sometimes frequents the margins of woods and scrubby, brush-covered hills.

It is easy in flight, seeming to hunt successfully on quite windy days, but is not possessed of the strong, vigorous and direct flight of many other hawks.

The migration northward is usually late in March and early in April, and southward in the crisp October and November days. Occasionally it is to be found in Iowa in mid-winter.

The habit of beating back and forth over the hunting territory, whether prairie or marsh, stopping now and then in the tall grass and rushes, or alighting upon some knoll on the prairie, corresponds in many respects to the performance of well-trained hunting dogs.

It is noteworthy that a great majority of the birds seen are in the red plumage, comparatively few "blue hawks" being observed.

At Eagle lake, in Hancock county, several of these birds were seen in June, hunting the rush-grown marsh, and the remains of their feasts littered the tops of Muskrat houses, where partly devoured Mud Hens, Grebes, and occasionally Ducks were to be found.

On September 2, 1914, while the writer was hunting with Mr. Henry Ward of Britt, a female Marsh Hawk arose from the thick rushes which were growing in the north end of Eagle lake. My companion killed the hawk and going to the spot from which it was first flushed, we found a male Wood Duck (*Aix sponsa*), with the head

and neck eaten to the bone, and the eyes plucked out. On skinning the duck later, a single shot-hole was found in its back not far from the right hip joint. The carcass was fresh and there is little doubt that the duck was killed by the hawk, after being weakened by its wound. In the stomach of this Marsh Hawk, nothing but the flesh and feathers of the duck were found. Mr. Ward says that these hawks sometimes kill ducks that are not wounded.

On one occasion a Marsh Hawk was seen to make repeated efforts to secure a robin from a flock perched in some willows that stood in the margin of the marsh, but without success.

In early June, while photographing three young Marsh Hawks in a nest not far from Eagle lake, my attention was attracted by the continued harassing of the female Marsh Hawk by a male Red-winged Blackbird which followed every turn of the hawk as she dashed close by over my head.

Again and again the hawk struck with her talons at the blackbird, which skillfully eluded them. Later the belligerent attitude of the Red-wing was better understood when, upon causing the young hawks to disgorge the contents of their distended crops, they were found to contain young blackbirds.

Unlike the majority of our hawks, this species nests on the ground, either in marshy land, or on brush-covered hillsides adjacent thereto. The surrounding vegetation effectually conceals the nest, but the feeding of the brooding female by the male may sometimes reveal its location. It has been observed that the male secures food which he carries to the vicinity of the nest and drops from aloft while in flight, whereupon the female leaves the nest, seizing the prey before it reaches the ground. When sufficiently developed, the young are sometimes fed in a similar manner.

It is the experience of the writer that the female is far more concerned with the protection of her young than is the male. She will come dashing through the air, swerving upward when within a few feet of one's head, returning again and again to repeat the performance. The male in the meantime is usually well out of gunshot.

The eggs are of a light bluish color, usually unspotted, commonly four to six in number, and measure about 1.85 by 1.43 inches.

In Fisher's "Hawks and Owls of the United States," there are no records of the stomach contents of this species from birds taken in Iowa, but birds taken elsewhere show that the main articles of diet are reptiles, insects, frogs, birds both small and large, and mammals.

The preponderance of meadow mice found in the stomachs of 124 Marsh Hawks obtained in various parts of the United States, as recorded by Dr. Fisher, speaks for the careful preservation of this bird of prey.

Because they frequent the marshes where gunners pursue wild-fowl, they are in the greater danger, and are more often shot carelessly as well as intentionally by hunters who little appreciate the economic value of these birds.

R. M. Anderson records that Mr. C. F. Henning of Boone found three adult and eight young field mice in the viscera of a Marsh Hawk taken October 20, 1890.

Fig. 21.—Map showing the distribution in Iowa of the Marsh Hawk.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1		Cedar Rapids.....	Oct. 17, '05.....	Bill of a seed-eating bird.....	Fur and bones of small Mammal		
2		Britt.....	May 16, '11 ..	Sparrow.....	Prairie squirrel.....	Sand-burr	Empty
3		Iowa City.....	Oct. 13, '13.....				
4	Male.....	Iowa.....	Oct. 21, '05.....				
5	Male.....	Ruthven.....	Oct. 17, '05.....	Chicken.....		1 grasshopper.....	
6	Female.....	Britt.....	Mch. 31, '15.....		Shrew.....		
7	Female.....	Iowa City.....	Oct. 21, '16.....		2 mice.....		

Circus Lacedpede, Tableaux Ois., 4, 1799, Type, by subs. desig., *Falco aeruginosus* Linnaeus (Lesson, 1828).

Falco hudsonius Linnaeus, Syst. Nat., ed. 12, I, 128, 1766 (Hudson Bay).

Circus hudsonius (Linnaeus).

**Falco* (*Circus* Bech.) *uliginosus*. Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie county.)

**Circus hudsonius* Linn. Baird, S. F., 9th Pacific R. R. Report. Part 2, Birds, p. 40, 1858. (Quasqueton.)

**Circus hudsonius* Linn. Baird, North American Birds of 1860, p. 40. (Quasqueton.)

**Circus hudsonius* Vieill. Allen, J. A., Notes on the Birds Observed in Western Iowa in the Months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, p. 500, 1868. (Denison.)

**Circus hudsonius* Viell. Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

**Circus hudsonius*. Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur and Mahaska counties.)

**Circus hudsonius*. Williams, H. S., Seasons and Birds of the Prairie: Forest and Stream, Vol. 22, No. 21, p. 403. (Charles City.)

**Circus hudsonius*. Preston, J. W., Hawk Notes: Ornithologist and Oologist, Vol. 10, No. 3, p. 35, 1885. (Baxter.)

Circus hudsonius. Warren, B. H., Birds of Pennsylvania, pp. 74-75, 1888.

**Circus hudsonius*. Webster, E. B., Migration Report: The Hawkeye Ornithologist and Oologist, Vol. 1, No. 3, p. 44, 1888. (Cresco.)

**Circus hudsonius* (Linn.). Jones, L., and Parker, W. H., Ibid. (Grinnell.)

**Circus hudsonius* (Linn.). Preston, J. W., Ibid. (Newton.)

Circus hudsonius. Cooke, W. W., Bird Migration in the Mississippi Valley, p. 113, 1888.

**Circus hudsonius*. Jones, Lynds, A List of Birds Found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.

**Circus hudsonius* (Linn.). Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 126, 1888.

**Circus hudsonius*. Crone, J. V., Summer Residents of Buena Vista County, Iowa: The Oologist, Vol. 7, No. 3, p. 46, 1890.

**Circus hudsonius*. Norris, J. P., A Series of Eggs of the Marsh Hawk: Ornithologist and Oologist, Vol. 15, No. 5, p. 72, 1890. (Baxter.)

**Circus hudsonius*. Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.

**Circus hudsonius*. Sheldon, Frank W., In Camp at Twin Lakes: Ornithologist and Oologist, Vol. 16, No. 10, p. 157, 1891.

- **Circus hudsonius*. Jones, Lynds, in Bendire's Life History of the North American Birds, Vol. 1, p. 186. 1892. (Grinnell.)
- **Circus hudsonius* (Linn.). Preston, J. W., Ibid, p. 185. (Baxter.)
- Circus hudsonius*. Bendire, Captain Charles, Life Histories of North American Birds, p. 183, 1892.
- **Circus hudsonius*. Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Circus hudsonius*. Hatch, Dr. P. L., Birds of Minnesota, p. 178, 1892.
- Circus hudsonius*. Fisher, Dr. A. K., Hawks and Owls of the U. S., p. 26, 1893.
- **Circus hudsonius*. Anderson, Rudolph M., A Collecting Trip in Northern Iowa: The Oologist, Vol. 11, No. 4, p. 142, 1894. (Lake Edwards, Hancock County.)
- **Circus hudsonius*. Jones, Lynds, Bird Migration at Grinnell, Iowa: The Auk, Vol. 12, p. 121, 1895.
- **Circus hudsonius*. Jones, Lynds, Ibid, p. 236.
- **Circus hudsonius*. Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 7.
- **Circus hudsonius*. Anderson, R. M., A Hawk Diary: The Nidologist, Vol. 3, Nos. 10 and 11, p. 124, 1896. (Forest City.)
- **Circus hudsonius*. Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 6, 1897.
- **Circus hudsonius*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 2, 1897.
- **Circus hudsonius*. Savage, W. G., Some Notes on the Birds and Weather in Van Buren County, Iowa, March, 1897: The Iowa Ornithologist, Vol. 3, No. 2, p. 27, April, 1897.
- **Circus hudsonius*. Savage, David L., Birds of the Midland Region: The Midland Monthly, Vol. 8, p. 465, 1897. (Southern Iowa.)
- **Circus hudsonius*. Wilson, B. H., One Small Piece of Ground: The Iowa Ornithologist, Vol. 3, No. 4, p. 48, October, 1897.
- Circus hudsonius*. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Circus hudsonius*. Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, 1907, pp. 90-91.
- Circus hudsonius*. Woodruff, F. M., The Birds of the Chicago Area, p. 72, 1907.
- Circus hudsonius*. Anderson, R. M., The Birds of Iowa, p. 244, 1907.
- Circus hudsonius*. Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 50, 1909.
- Circus hudsonius*. Cory, C. B., Birds of Illinois and Wisconsin, p. 455, 1909.
- Circus hudsonius*. A. O. U. Checklist, 1910, p. 155.
- Circus hudsonius*. Chapman, F. M., Birds of Eastern North America, p. 292, 1912.
- Circus hudsonius*. Bunker, C. D., The Birds of Kansas, p. 146, 1913.

FIG. 22.—The Sharp-shinned Hawk, adult.

Genus *Accipiter* Brisson.

5. *ACCIPITER VELOX* (Wilson). 332.

Sharp-shinned Hawk. Little Chicken Hawk.

Slate-colored Hawk.

Field Characters.—A small, slender-legged, brownish or slate colored hawk, with rounded wings and *long square-tipped tail*. Usually seen along the hedges and the brushy margins of timber lands pursuing small birds.

Description.—Above, bluish or brownish gray, darker on head. *Tail square*, crossed by four noticeable dark bands; flight feathers barred with dusky. Below, heavily barred with reddish buff on a white background.

Immature: With buff-margined brownish feathers above, and white below with streaks of dusky or reddish brown.

Measurements.—Length, 10 to 14 inches; wing, 6 to 8.50 inches; tail, 6 to 8 inches.

Range.—North America generally. Breeds nearly everywhere in its United States range. Winters from Iowa southward.

These destructive little hawks are common to all parts of the state, especially during the spring and fall migrations, although only a comparatively small number remain here to nest. They are most frequently seen in brush-land along the border of timber, and the wooded banks of streams and lakes. They do not soar like the larger "buzzard hawks," but usually fly with short quick wing-strokes at no great height. They are exceedingly alert and depend largely on their slyness and dash in capturing prey.

The call is described as similar to that of Cooper's Hawk though not so loud, and is represented by KAK-KAK-KAK-KAK-KAK-KAK sharply accented and high pitched. This note is uttered when the nest is approached, and they are said to defend their homes with considerable vigor.

While the writer was waiting in a boat on Cedar lake for incoming ducks, a flock of Red-winged Blackbirds arose from the rushes when instantly a Sharp-shinned Hawk darted into their midst, his claws striking right and left. A shot stopped him before he succeeded in capturing any of the flock.

Not infrequently they have been known to venture into the thickly settled parts of cities in pursuit of English Sparrows.

Although March and April and September and October are the months of their greatest abundance, I have taken one in the eastern part of the state as late as December 20.

It has been found nesting near Grinnell by Mr. Lynds Jones, who notes that they build in cavities of the Linden tree, or when nesting in the open, choose "limbless trees, most frequently oaks, to nest in, from 15 to 20 feet up." In the Iowa Ornithologist (October, 1897), Mr. Paul Bartsch, writing on the "Birds of the Oneota Valley," says: "Common: breeds in the crevices in the cliffs. The young are very noisy and usually betray the nesting site by their notes. I examined one of these abodes several hundred feet above the river on the cliff adjacent to the Chicago and Milwaukee Railroad near its junction with the Oneota, a little southwest of New Albin (Iowa Bluff), and found numerous wings of the smaller birds, such as warblers, Black Birds, Meadow Larks, Song Sparrows, Flickers, Robins, etc., etc., as well as some bones belonging to small rodents, spermophiles perhaps, scattered about the crevice. The young were large enough to vacate the residence when I made my appearance (July 5, 1895), and I had to be content to gaze upon the amount of mischief wrought by a family of these falcons. The Sharp-shin surely has few redeeming features, when we consider the amount of havoc he causes among our small birds."

The nest is unusually large for so small a hawk, and is "made of dry sticks more or less compactly placed together, with or without a sparse lining of soft inner bark or green leaves."

The eggs are ordinarily deposited by the second or third week in May, are heavily spotted and blotched with varying shades of brown, and measure about 1.46x1.16 inches.

The Sharp-shinned Hawks feed largely on small birds, many of which are seed eaters, and devour quantities of weed-seed and therefore are of great economic value.

Where young chickens are to be had the hawks are said to continue their depredations as long as the supply of poultry holds out.

The Sharp-shinned Hawk, Cooper's Hawk, and Goshawk, are responsible for the greater share of the blame which has been placed upon hawks in general for the destruction of poultry. Of the three species named, only the first two are found in Iowa during the warmer part of the year, and the Sharp-shinned Hawk fortunately is not present in sufficient numbers to constitute the serious menace which his naturally destructive instincts would otherwise permit him to be. N. S. Goss says: "I admire their courage and dash, but cannot find it in my heart to say one good word in their favor."

Fig. 24.—Map showing the distribution in Iowa of the Sharp-shinned Hawk.

Accipiter Brisson, Orn., I, 310, 1760. Type, by tautonymy, [*Accipiter*] *accipiter* Brisson=*Falco nisus* Linnaeus.

Falco velox Wilson, Amer. Orn., V, 116, pl. 45, fig. 1, 1812. (Banks of Schuylkill River, near Philadelphia, Pa.)

Accipiter velox (Wilson).

**Falco velox* Wilson. Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie County.)

**Accipiter fuscus* Bonap. Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

**A(ccipiter) fuscus* Bonap. Parker, H. W., Iowa Birds: The American Naturalist, Vol. 5, p. 169, 1871. (Clinton County.)

**Accipiter fuscus*. Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur and Mahaska Counties.)

**Accipiter velox* Wilson. Cooke, W. W., Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 114.

Accipiter velox. Warren, B. H., Birds of Pennsylvania, pp. 75-77, 1888.

**Accipiter velox* (Wilson). Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 126, 1888.

Accipiter velox. Ridgway, R., Ornithology of Illinois, p. 457, 1889.

- **Accipiter velox*. Jones, Lynds, A List of Birds Found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- **Accipiter velox*. Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- Accipiter velox*. Goss, N. S., History of the Birds of Kansas, 1891, p. 254.
- **Accipiter velox*. Sheldon, Frank W., In Camp at Twin Lakes: Ornithologist and Oologist, Vol. 16, No. 10, p. 157, 1891.
- **Accipiter velox*, Balliet, Letson, *Buteo Borealis* and Other Hawks: The Wisconsin Naturalist, Vol. 1, No. 7, p. 110, 1891. (Des Moines.)
- **Accipiter velox* (Wilson). Jones, Lynds, in Bendire's Life History of the North American Birds, Vol. 1, p. 189, 1892. (Grinnell.)
- Accipiter velox*. Hatch, Dr. P. L., Birds of Minnesota, p. 180, 1892.
- **Accipiter velox* (Wilson). Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Department of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Accipiter velox*. Fisher, A. K., Hawks and Owls of the U. S., p. 32, 1893.
- **Accipiter velox*. Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 7.
- **Accipiter velox*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 2, 1897.
- **Accipiter velox*. Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 6, 1897.
- **Accipiter velox*. Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, pp. 35, 54, October, 1897. (Winneshiek and Allamakee Counties, to Eagle Point, Dubuque.)
- **Accipiter velox*. Savage, D. L., Discussion: The Iowa Ornithologist, Vol. 3, No. 4, p. 62, October, 1897. (Henry County.)
- Accipiter velox*. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Accipiter velox*. Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, 1907, pp. 91-92.
- Accipiter velox*. Anderson, R. M., Birds of Iowa, p. 244, 1907.
- Accipiter velox*. Woodruff, F. M., The Birds of the Chicago Area, p. 92, 1907.
- Accipiter velox*. Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 50, 1909.
- Accipiter velox*. Cory, C. B., Birds of Illinois and Wisconsin, p. 456, 1909.
- Accipiter velox*. A. O. U. Checklist, 1910, p. 155.
- Accipiter velox*. Chapman, F. M., Birds of Eastern U. S., p. 293, 1912.
- Accipiter velox*. Pellett, Frank C., Friends and Foes of the Fruit Grower: Sixth Annual Report of the Missouri State Board of Agriculture, pp. 113-127, 1912.
- Accipiter velox*. Bunker, C. D., The Birds of Kansas, p. 147, 1913.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Male	Cedar Rapids	May 29, '03	Small bird (sparrow?)			
2	Female	Cedar Rapids	Sept. 28, '05	Bird (probably a sparrow)			
3	Male	Glidden	Sept. 22, '05		Small rodent		
4	Female	Cedar Rapids	Dec. 20, '05	Small bird			
5		Iowa City	Sept. 15, '15	Small bird (Passerine)			
6		Iowa City	Sept. 23, '15				
7	Female	Iowa City	Oct. 10, '15	Small bird (Fringilline)			Empty
8		Iowa City	Oct. 15, '15			A seed	
9	Male	Iowa City	Oct. 18, '15	Small bird (Passerine)			
10	Male	Iowa City					
11	Male	Iowa City	Sept. 24, '15	Seed-eating bird			
12	Female	Iowa City		Traces of feathers			
13	Female	Cedar Rapids	Oct. 20, '05	Small bird			Empty

6. *ACCIPITER COOPERI* (Bonaparte). 333.

Cooper's Hawk. Little Hen Hawk. Chicken Hawk.
Blue Hen Hawk.

Field Characters.—A medium-sized slaty or brownish hawk, with *long rounded tail*; streaked or barred beneath; flying by continued strokes of its rounded wings, or sailing for short distances, but not usually soaring.

Fig. 25—Cooper's Hawk, adult.

Description.—Above, slaty with blackish crown, flight feathers barred; rounded tail with dusky bars and tipped with white. Below, with reddish buff barring on white background.

Immature: Dusky above, the feathers edged with buff; below, white, with dusky or brownish streaks; tail barred.

Measurements.—Length, 14 to 20 inches; wing, 9 to 11 inches; tail, 8 to 10.50 inches.

Range.—North America; breeding in general throughout the United States, and wintering from Colorado, Nebraska and Ohio, southward.

Cooper's Hawk is without doubt the most destructive of our resident diurnal birds of prey. It is a common species throughout the State, arriving early in April and usually nesting the latter part of that month or the first week in May. Cooper's Hawk is not often found in large timber or where the giant oaks stand, but rather in the

Fig. 26.—Cooper's Hawk, young female.

second growth, or among the scattered trees of brush-grown pastures, and in the vicinity of streams and sloughs. It is a wary bird, and not easily approached unless engaged in hunting or feeding. Its dash and daring in securing poultry and game are well known, many writers remarking that it lacks nothing of the spirit, but only the size and strength of our larger birds of prey.

One of my earlier ornithological experiences was with a slightly wounded Cooper's Hawk which I was over-anxious to secure. On reaching out eager hands to grasp my prize I found that I was as eagerly grasped in return. He was my prize, and I, for a time, was truly his.

Usually these birds are unresisting when the nest is approached, though they utter their noisy protesting KAK-KAK-KAK-KAK-KAK, especially if they have young. At times there is difficulty, even on repeated visits, in obtaining sight of the bird as she silently slips off the farther side of the nest.

The nest may be built by the birds themselves, or an old crow's nest may be remodeled. Second growth oaks or hickories are preferred, and the nest is commonly placed at a height of from twenty to forty feet, the location being well chosen in a solid crotch near the trunk of the tree.

Sticks of varying size enter into its construction, and in the majority of cases even where the nest is built in an oak, the eggs are laid upon the flat pieces of outer bark of the shell-bark hickory with which the nest is meagerly lined.

The eggs are light bluish white, either unmarked or with only a few scattering reddish brown or purplish spots, and average about 2 by 1.50 inches. Captain Bendire notes that fully one-half of the Cooper's Hawk eggs in the National Museum collection are "spotted with irregular markings or scrawls of different shades of brown, drab or fawn color." I have never taken a noticeably marked set, and have found four to be the usual complement, though one set of five was collected.

A second set will often be deposited if the first eggs are removed. N. S. Goss, in speaking of the bills of fare of the Cooper's Hawk, mentions "Rabbits, mice, small birds, Bob Whites and ducks," and says: "I saw one of the birds strike a hen, while in defense of her brood, with a force that killed her, and then grasp in its claws a half-grown chicken and triumphantly carry it away."

A. K. Fisher in summing up the report on 133 stomachs of the Cooper's Hawk taken in various parts of the United States says: "Thirty-four contained poultry or game birds; 52, other birds; 11, mammals; 1, frog; 3, lizards; 2, insects; and 39 were empty."

B. H. Warren, in Pennsylvania, examined 34 stomachs of this hawk and found that 16 contained chickens; 10 small birds (spar-

rows, warblers and meadow-larks); 2, quail; 1, bullfrogs; 3, mice and insects; 2, hair and other remains of small quadrupeds.

As many as fifty chickens are reported to have been taken from a single farm-yard, twelve of them in one day.

It is conceded by practically every ornithologist that the Cooper's Hawk may well be reduced in numbers, if not exterminated, with profit, but it is of the greatest importance that those who attempt to reduce its numbers be able to distinguish the nests, eggs and young of this species readily in order that innocent and beneficial hawks may not suffer with the guilty.

Fig. 27.—Map showing the distribution in Iowa of Cooper's Hawk.

Accipiter Brisson, Orn., I, 310, 1760. Type, by tautonymy, [*Accipiter*] *accipiter* Brisson=*Falco nisus* Linnaeus.

Falco cooperii Bonaparte, Amer. Orn., II, 1, pl. X, fig. 1, 1828. (Near Bordentown, N. J.)

Accipiter cooperi (Bonaparte).

**Accipiter cooperi* Bonap. Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

**Accipiter cooperi*. Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 242, 1872. (Decatur and Mahaska Counties.)

**Accipiter cooperi* (Wilson). Jones, L., and Parker, H. W., in W. W. Cooke's Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 114. (Grinnell.)

- **Accipiter cooperi* (Bonap.). Peck, G. D., and Morton, H. E., Ibid, p. 114. (LaPorte City.)
- **Accipiter cooperi*. Norris, J. P., A Series of Eggs of *Accipiter cooperi*: Ornithologist and Oologist, Vol. 13, No. 4, p. 51, 1888. (Black Hawk County.)
- **Accipiter cooperi* (Bonap.). Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 126, 1888.
- Accipiter cooperi*. Warren, B. H., Birds of Pennsylvania, pp. 77-80, 1888.
- Accipiter cooperi*. Ridgway, R., Ornithology of Illinois, p. 455, 1889.
- **Accipiter cooperi*. Jones, Lynds, A List of the Birds Found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- **Accipiter cooperi*. White, H. G., Geographical Variation of Eggs: Ornithologist and Oologist, Vol. 15, No. 1, p. 2, 1890.
- **Accipiter cooperi*. Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- **Accipiter cooperi*. Balliet, Letson, *Buteo borealis* and Other Hawks: The Wisconsin Naturalist, Vol. 1, No. 7, p. 110, 1891. (Des Moines.)
- Accipiter cooperi*. Hatch, Dr. P. L., Birds of Minnesota, p. 181, 1892.
- **Accipiter cooperi* (Bonap.). Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- **Accipiter cooperi*. Savage, D. L., Discussion: The Iowa Ornithologist, Vol. 3, No. 4, p. 62, October, 1892. (Henry County.)
- Accipiter cooperi*. Goss, N. S., History of the Birds of Kansas, p. 256, 1892.
- Accipiter cooperi*. Preston, J. W., Notes on Bird Flight: Ornithologist and Oologist, Vol. 17, No. 3, p. 41, 1892.
- Accipiter cooperi*. Bendire, Capt. Chas., Life Histories of North American Birds, p. 192, 1892.
- Accipiter cooperi*. Fisher, A. K., Hawks and Owls of the U. S., p. 38, 1893.
- **Accipiter cooperi*. Savage, David L., Notes on the Birds of Henry County, Iowa: The Oologist, Vol. 10, No. 12, p. 325, 1893.
- **Accipiter cooperi*. Jones, Lynds, Bird Migration at Grinnell, Iowa: The Auk, Vol. 12, pp. 121, 128, 1895.
- **Accipiter cooperi*. Jones, Lynds, Ibid,, p. 236.
- **Accipiter cooperi*. Savage, D. L., My Life History: The Iowa Ornithologist, Vol. 1, No. 4, p. 93, 1895. (Henry County.)
- **Accipiter cooperi*. Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 7.
- **Accipiter cooperi*. Anderson, R. M., A Hawk Diary: The Nidologist, Vol. 3, Nos. 10, 11, p. 124, 1896. (Forest City.)
- **Accipiter cooperi*. Orr, Ellison, The Finding of Owls' Nests: The Oologist, Vol. 13, No. 3, pp. 17, 18, 1896.

- *Accipiter cooperi. Woods, Paul C., Notes and News: The Iowa Ornithologist, Vol. 2, No. 4, p. 86, 1896. (Spencer.)
- *Accipiter cooperi. Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa. p. 6, 1897.
- *Accipiter cooperi. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 3, 1897.
- *Accipiter cooperi. Savage, W. G., Some Notes on the Birds and Weather in Van Buren County, Iowa, March, 1897: The Iowa Ornithologist, Vol. 3, No. 2, p. 26, April, 1897.
- *Accipiter cooperi. Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 55, October, 1897. (Winneshiek and Allamakee Counties.)
- Accipiter cooperi. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Accipiter cooperi. Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, 1907, pp. 92-93.
- Accipiter cooperi. Woodruff, F. M., Birds of the Chicago Area, p. 93, 1907.
- Accipiter cooperi. Anderson, R. M., Birds of Iowa, p. 245, 1907.
- Accipiter cooperi. Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, pp. 50-51, 1909.
- Accipiter cooperi. Cory, C. B., Birds of Illinois and Wisconsin, p. 457, 1909.
- Accipiter cooperi. A. O. U. Checklist of N. Am. Birds, 1910, p. 156.
- †Accipiter cooperi. Pellett, Frank C., Friends and Foes of the Fruit Grower: Sixth Annual Report of the Missouri State Board of Agriculture, pp. 113-127, 1912.
- †Accipiter cooperi. Pellett, Frank C., Food Habits of the Red-tailed Hawk, Cooper Hawk, and Sparrow Hawk. Proc. Ia. Acad. Sci., XIX, pp. 199-201, 1912.
- Accipiter cooperi. Chapman, F. M., Birds of Eastern North America, p. 294, 1912.
- Accipiter cooperi. Bunker, C. D., The Birds of Kansas, p. 147, 1913.
- †Pellett, Frank C., The Chicken Thief: Outing, March, 1916, pp. 606, 612.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1		Iowa.....		Remains of small chicken.....			
2		Iowa City.....	Aug. 28, '14	Remains of small bird.....			
3	Male	Iowa City.....	Sept. 9, '14	Small seed-eating bird.....	Rodent (Gopher?)		
4		Iowa City.....	Oct. 19, '14	Feathers.....			
5	Male	Iowa.....	Sept. 24, '15				
6	Male	Iowa City.....	Sept. 24, '15	Small bird.....			Empty
7		Iowa.....	Sept. —, '15	2 seed-eating birds.....			
8		Iowa City.....	Nov. 8, '15	Small bird.....

Fig. 28.—The Goshawk or Big Blue Hen Hawk.

Fig. 29.—The Goshawk, another view.

Genus *Astur* Lacepede.

7. *ASTUR ATRICAPILLUS ATRICAPILLUS* (Wilson). 334.

Goshawk. Big Blue Hen Hawk. Big Blue Chicken Hawk.

Field Characters.—A large slate colored hawk with darker crown; grayish below; tail long and wings rounded. Found here in late fall, winter and early spring.

Description.—Above, slate colored, with blackish crown and a white line above and behind the eye. Tail with five indistinct dark bars.

Below, everywhere closely barred with slate-gray and white; the feathers showing black shaft-lines.

Immature birds are dusky above, the feathers buffy edged; tail with definite dark bars. Below whitish with blackish streaks.

Measurements.—Length, 21 to 24 inches; wing, 12 to 14 inches; tail, 10 to 12 inches.

Range.—North America. Breeds chiefly north of the United States. In winter is found as far south as Missouri, Oklahoma and Mexico.

The Goshawk is found in Iowa during the colder part of the year, reaching us from the north usually about the middle of November. It is closely related to the Cooper's and Sharp-shinned Hawks but is much larger and more powerful than either, and is bolder and more daring in pursuit of its prey.

In Iowa it is apparently less a bird of the open than either of the above-named species, being found usually in or near timber, though it comes to the farmyard fearlessly in quest of doves and chickens. R. M. Anderson speaks of it as occurring "from November to April," and says further that it "has been recorded from most sections of the State."

While it doubtless occurs every year, it frequently appears to be so uncommon that it is easily overlooked. In December, 1906, a bird taken near Cedar Rapids was brought to the writer by Mr. G. H. Berry. In midwinter, later, two tail feathers of the Goshawk were brought in for identification. They had been taken from a trap set near a dove-cote which was being visited by one of these birds.

During about ten years past not a single specimen of this species had been received by the State University, but the recent fall and winter (1916-17) witnessed a remarkable flight of Goshawks in this

and nearby states. In all, no less than thirty of these birds have been reported to the writer between early October and the middle of January.

The observations made by Dr. T. C. Stephens and W. J. Himmel of Sioux City give evidence that these birds first appeared in that region as early as October 5, and nine birds in all are reported by them from that date to early December.

Mr. Harold Thiesen of Hamburg had received two Goshawks before Thanksgiving day, and Mr. T. R. Cowles of the same place had taken one specimen and had seen four others. Near Cedar Rapids some five specimens in all were secured, while the remainder of those noted were either shot by students of the University of Iowa or were sent to the laboratory of Professor Homer R. Dill of that institution. Comparatively few of the stomachs of these birds were examined, but of those in which the contents were reported only one had traces of mammal hair. The observations and testimony of those who shot a number of these hawks was almost unanimous as to the destruction of poultry by the Goshawks they killed. One was shot while attempting to capture a turkey; several were shot while eating chickens, and others while attempting to secure them. Four specimens (one *A. a. striatulus*) were received from Mr. Joseph Shellhorn near Cedar Rapids, who said that he had killed them all during one week and that he had lost no less than twenty-five or thirty of his fowls by their raids.

The dates on which the birds were recorded indicate that the flight first reached Iowa from the north and west early in October, and that by the middle of the month specimens were being taken in Iowa City. At Hamburg the first record seems to be October 25. The last bird examined was taken at Iowa City the 15th of December. Among the specimens secured the sexes are about equally divided.

The evidence in hand shows that this species is the most destructive of Iowa hawks, and that it would be a matter of serious concern if these birds should become as common every winter as they have been during the past season.

Fig. 30.—Map showing the distribution in Iowa of the Goshawk.

Astur Lacepede, Tableaux Ois., 4, 1799. Type, by subs. desig., *Falco palumbarius* Linnaeus (Vigors, 1824).

Falco atricapillus Wilson, Amer. Orn., VI, 80, pl. 52, fig. 3, 1812. (Near Philadelphia, Pa.)

Astur atricapillus atricapillus (Wilson).

**Astur atricapillus* (Wils.) Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

**Astur atricapillus*. Baird, S. F., Brewer, T. M., Ridgway, R., A History of North American Birds, Land Birds, Vol. III, p. 242, 1875.

**Accipiter atricapillus*. Lindley, J. W., Mississippi Valley Migration: Ornithologist and Oologist, Vol. 8, No. 5, p. 33, 1883. (Mitchell.)

**Accipiter atricapillus*. Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 127. 1888.

Accipiter atricapillus. Warren, B. H., Birds of Pennsylvania, p. 80, 1888.

Accipiter atricapillus (Wils.). Ridgway, R., Ornithology of Illinois, p. 459, 1889.

Accipiter atricapillus (Wils.). Goss, N. S., History of the Birds of Kansas,
p. 258. 1891.

**Accipiter atricapillus* (Wilson). Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7. 1892.

Accipiter atricapillus (Wilson). Bendire, Capt. Chas., Life Histories of North American Birds, pp. 196-199, 1892.

- Accipiter atricapillus* (Wils.). Hatch, Dr. P. L., *Birds of Minnesota*, p. 183, 1892.
- **Accipiter atricapillus*. Preston, J. W., *Notes on Bird Flight: Ornithologist and Oologist*, Vol. 17, No. 3, p. 41, 1892.
- Accipiter atricapillus*. Fisher, A. K., *Hawks and Owls of the United States*, pp. 43-46, 1893.
- **Accipiter atricapillus*. Anderson, R. M., *Birds of Winnebago and Hancock Counties, Iowa*, p. 6, 1897.
- *(*Astur atricapillus*). Keyes, Charles Reuben, *The Iowan Raptores: The Iowa Ornithologist*, Vol. 3, No. 2, p. 20, April, 1897.
- Accipiter atricapillus*. Bailey, B. H., *Two Hundred Wild Birds of Iowa*, p. 62, 1906.
- Accipiter atricapillus* (Wils.). Woodruff, F. M., *Birds of the Chicago Area*, p. 93, 1907.
- Accipiter atricapillus* (Wils.). Widmann, Otto, *A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. of Science of St. Louis*, 1907, pp. 93-94.
- Accipiter atricapillus* (Wilson). Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 51, 1909.
- Astur atricapillus* (Wils.). Cory, C. B., *Birds of Illinois and Wisconsin*, p. 458, 1909.
- Astur atricapillus* (Wilson). A. O. U. Checklist, 1910, p. 156.
- Astur atricapillus atricapillus* (Wils.). Chapman, F. M., *Birds of Eastern North America*, p. 294, 1912.
- Astur atricapillus atricapillus* (Wils.). Bunker, C. D., *The Birds of Kansas*, p. 147, 1913.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Female.....	Iowa City.....	Oct. 22, '16.....				Empty
2	Female.....	Guthrie County.....	Oct. 22, '16.....	Trace of feathers.....			Empty
3	Female.....	Iowa City.....	Oct. —, '16.....				Empty
4	Male ?	Homestead.....	Oct. 23, '16.....				Empty
5	Male.....	Homestead.....	Oct. 26, '16.....		Hair of small rodent.....		Empty
6	Female.....	Iowa City.....	Nov. 21, '16.....				Empty
7	Male.....	Iowa City.....					Empty
8	Female.....	Iowa City.....	Nov. 15, '16.....				Empty

7A. *ASTUR ATRICAPILLUS STRIATULUS* (Ridgway). 334a.

Western Goshawk.

Field Characters.—Scarcely distinguishable from the Goshawk except at very close range.

Description.—Adults dark lead color or blackish on the head and back. Whitish below with dark slate colored bars which are heavier and darker than in the Goshawk.

Immature with brownish black backs. Beneath heavily striped with dark slate, and with dusky spots on the thighs.

Measurements.—As in the Goshawk.

Range.—Northern part of the Pacific coast. South in winter to California, and casually eastward to Iowa and Illinois.

Fig. 31.—Map showing the distribution in Iowa of the Western Goshawk.

The western form of the Goshawk, first recognized by Mr. Ridgway, has not been hitherto reported from Iowa, although Dr. C. B. Cory mentions a specimen taken by Mr. Chas. K. Worthen near Warsaw, Illinois. Two specimens of the Western Goshawk have been secured in Iowa during the winter of 1916-17; one by Mr. Wesley Kubichek at Iowa City, and the other was shot by Mr. Joseph Shellhorn near Cedar Rapids. Both birds are adult.

Astur Lacepede, Tableaux Ois., 4, 1799. Type by subs. design., *Falco palumbarius* Linnaeus (Vigors, 1824).

Astur atricapillus var. *striatulus* Ridgway, in Hist. N. A. Birds, III, 240, 1874. (Fort Steilacoom, Puget Sound, Washington.)

Astur atricapillus striatulus Ridgway.

Accipiter atricapillus striatulus Ridgway. Ridgway, R., Manual of North Am. Birds, p. 228, 1900.

Accipiter atricapillus striatulus Ridgway. Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 51, 1909.

Astur atricapillus striatulus Ridgway. Cory, C. B., Birds of Illinois and Wisconsin, p. 460, 1909.

Astur atricapillus striatulus Ridgway. A. O. U. Checklist, 1910, p. 156.

Fig. 32.—Harris's Hawk (Photo by Professor H. R. Dill).

Genus *Parabuteo* Ridgway8. *PARABUTEO UNICINCTUS HARRISI* (Audubon). 335.

Harris's Hawk.

Field Characters.—A large dark colored hawk with red thighs and shoulders. Tail *white* at base and *broadly white tipped*.

Description.—Above, dusky brownish or reddish brown with rufous shoulders; tail black, with white at base and tip. Below, sooty brown, the thighs and linings of wings chestnut.

Measurements.—Length, 18 to 22 inches; wing, 13 to 14.50 inches; tail, 10 to 11 inches.

Range.—Extreme southern United States. Accidental in Iowa, there being but one record of its occurrence in the state.

The single Iowa record of this bird of the far southwest is noted by R. M. Anderson in "The Birds of Iowa," as follows: "Its admission to the Iowa list is based upon a single specimen captured in Van Buren County, near Hillsboro. Walter G. Savage writes concerning it, February 25, 1904, 'Nine years ago a trapper caught one in a steel

Fig. 33.—Map showing the distribution in Iowa of Harris's Hawk.

trap and brought it to me. This is the only one that I can positively identify in our locality. My father took this Hawk and now has a fine painting of it true to nature. It is identical with your description and also with Coues'. It is surely a Harris Hawk."

A. K. Fisher says, "The food of this hawk consists largely of offal, the smaller reptiles and mammals, and occasionally birds. Mr. C. C. Nutting states that a specimen obtained in Costa Rica was shot while in the act of carrying off a chicken." (Proc. U. S. Nat'l Mus., Vol. 5, p. 404, 1882.)

Parabuteo Ridgway, in Hist. N. A. Birds, III, 250, 1874. Type, by orig. desig., *Falco harrisi* Audubon=*Buteo harrisi* Audubon.

Buteo harrisi Audubon, Birds Amer. (folio), IV, pl. 392, 1837. (Between Bayou Sara and Natchez, Mississippi.)

Parabuteo unicinctus harrisi (Audubon).

Parabuteo unicinctus harrisi (Audubon). Fisher, A. K., Hawks and Owls of the U. S., pp. 47-48, 1893.

Parabuteo unicinctus harrisi (Audubon). Bendire, Capt. Chas., Life Histories of North American Birds, pp. 202-204, 1893.

Parabuteo unicinctus harrisi (Audubon). Anderson, R. M., Birds of Iowa, p. 246, 1907.

Parabuteo unicinctus harrisi (Audubon). A. O. U. Checklist, 1910, p. 157.

Parabuteo unicinctus harrisi (Audubon). Chapman, F. M., Birds of Eastern North America, p. 295, 1912.

Fig. 34.—The Red-tailed Hawk.

Fig. 35.—The Red-tailed Hawk, another view.

Genus **Buteo** Lacepede.Subgenus **Buteo**9. *BUTEO BOREALIS BOREALIS* (Gmelin). 337.

Red-tailed Hawk. Eastern Red-tail.

Big Chicken-Hawk. Hen-Hawk.

Field Characters.—A hawk of large size, dark above, whitish below. In adult birds the *tail rusty red above*, lighter below. The red of the tail showing from beneath where the bird soars toward the sun. Cry, a high-pitched penetrating keeeee keeeeee.

Immature birds as large as adults, but with *several dark bands* on the tail and *no red* anywhere.

Description.—Above blackish with irregular markings of whitish, tawny and rusty. Below, white or buffy white. Throat clear white or with a few dark streaks. Upper breast at sides dusty. Lower breast and belly marked more or less with dark streaks and spots.

Tail rufous with one distinct black bar near the white tip. Feathers of the legs whitish with few if any markings.

Immature: Marked above much like the adult. Below with no red anywhere, but a belt of dusky markings across the lower part of the breast. Tail grayish, crossed by six to ten dark bands.

Measurements.—Length, 19 to 25 inches; wing, 13.50 to 17.75 inches; tail, 8.50 to 10.50 inches.

Range.—Eastern North America from Wisconsin, Iowa and eastern Texas eastward.

The size and relative abundance of this large hawk make it easily the most conspicuous of the diurnal birds of prey within the state. It is not an uncommon sight to those who live in rural districts to see this "big chicken-hawk," as it is commonly called, perched on some dead tree in the pasture, or flapping slowly across the road from field to field. At mid-day it may be seen with wings and tail fully spread circling high in the air, its tail showing brick-red in the transmitted light as it sails toward the sun, uttering a shrill keeeee keeeee.

While this species may resort to rather densely timbered tracts at times, the majority of Red-tails seem to enjoy the margins of the forests and pastures which have here and there a dead cottonwood, from which perch a sharp lookout may be kept for the humble prey.

Sometimes this hawk may be seen on the ground awkwardly maneuvering to capture insects, and evidently successful in his efforts.

It is never more graceful than when, far aloft, with seemingly motionless wings, it sweeps in wide circles, drifting with the breeze.

The Red-tail, together with other buzzard hawks, lacks the dash of the true falcons, and it is no infrequent sight to see the Kingbird (*Tyrannus tyrannus*) pursuing and harassing one of these large hawks.

While the Red-tailed Hawk is far more abundant in the spring, summer and autumn than in the winter months, nevertheless this bird is with us even in the most inclement weather.

The migratory movements of this species are most easily observed during the late fall when the adults, together with the young, may be seen in widely scattered flocks moving gradually southward as they hunt. They are also to be seen late in March in northern Iowa wheeling and flapping northward on a breeze from the south, sometimes a dozen being in sight at once, at other times pairs or singles passing at intervals of a few minutes.

The Red-tail usually builds during the early part of March, or repairs a nest suitably located. The structure is bulky, made of sticks and twigs of varying size; and has a lining of softer material—corn husks, leaves and shredded bark being used; or the strippings from corn-stalks, as has been noted by Professor Keyes. The same nest will be used again and again by a pair of Hawks, often with very little repair.

Oak and cottonwood trees either in timbered uplands or in river bottoms, may be chosen, and the tree selected for nest building is often at or near the edge of more densely wooded land. These birds seem to count of more importance the size of the tree and the height at which the nest may be placed, than they do the matter of concealment by surrounding timber.

According to F. L. Burns, the period of incubation is twenty-eight days, and both sexes incubate the eggs, which number from two to four in a clutch. They range from a dirty white or bluish white ground color unspotted, to quite heavily marked eggs with rich reddish brown spots having deeper shell tints of lilac, the heavier markings being placed usually toward the larger end of the egg.

While it is true that the food of Red-tailed Hawks taken in states contiguous to Iowa may be essentially similar to that of birds secured within the state, it is, however, desirable to know more about the food of those actually within our borders.

Of the 562 stomachs of this hawk reported upon by Dr. A. K. Fisher in "Hawks and Owls of the United States," only a single stomach of all those examined came from an Iowa specimen. This lone representative from the "Hawkeye state" was collected at Keokuk, December 22, 1889, and was credited with having devoured "mice."

Doctor Fisher says, "It has been demonstrated by careful stomach examination that poultry and game birds do not constitute more than ten per cent of the food of this hawk, and that all the other beneficial animals preyed upon, including snakes, will not increase this proportion to fifteen per cent. Thus the balance in favor of the hawk is at least 85 per cent, made up largely of injurious rodents—a fact that every thoughtful farmer should remember."

There is no denying that this hawk does kill poultry, but it is made clear by careful study of the food throughout the year that there is no reason for the indiscriminate slaughter of every individual of this species.

Those hawks which visit the poultry yard too frequently may be shot if necessary, but it is doubtful even then, in view of the fact that chicken is only a part of the bird's diet, whether the farmer is gainer thereby. We are not inclined to exterminate the male population in knickerbockers because of an uncontrolled appetite for apples, grapes or melons at certain seasons of the year.

Mr. Frank Pellett of Atlantic had under observation a pair of Red-tailed Hawks that had selected a nesting site near a farmyard. He "shadowed" this family of Red-tails from March to June, 1910, and found that "apparently the pocket gopher was brought in more often than any other single item of food." He says, "If this family of hawks is a fair example, I think it safe to estimate the number of pocket gophers caught by a family of Red-tailed Hawks during a summer at one hundred." "Aside from pocket gophers the food consisted of prairie grey squirrels, striped ground squirrels, rats and field mice." "During the entire time that the birds were under observation, they were only observed to have two small chickens about the size of a quail."

"As an example of the bill of fare, they were seen to have three pocket gophers, a prairie grey squirrel and two field mice in one day."

Some observers believe that young and therefore less skillful birds are more likely to attack poultry because of the ease with which such prey may be secured.

B. H. Warren records 173 stomachs examined of which 128 contained principally field mice and other small quadrupeds. Fourteen had fed on chickens, and three on snakes. He says, "I have repeatedly found three or four mice in the viscera of one bird." And he reports that as many as seven were found in a single specimen.

N. S. Goss says, "In habits it is rather sluggish, feeding chiefly upon rabbits, mice and moles, which it occasionally swoops down upon from the air, but generally from a perch, where it patiently watches for its prey. It now and then drops upon a duck, Bob White, or stray fowl from the yard, but it is not quick enough to catch the smaller birds, and never gives chase after a bird on the wing. It has not the courage or dash to venture within the dooryard, unless in a secluded place.

"I know the farmer looks upon them as an enemy, but after a careful study of their habits, and an examination of many of their stomachs, I have reached the conclusion that they are far more beneficial than injurious, in fact, one of his best friends." "They also delight to sail in the air, . . . and during the insect season, while thus sail-

ing, often fill their craws with grasshoppers, that during the after part of the day also enjoy a sail in the air."

Other writers have noted that the Red-tailed Hawk sometimes feeds upon crows, especially the weak or sickly birds in localities where crows roost in numbers.

On one occasion while hunting on the farm of Hon. James Wilson near Traer, Iowa, the writer approached a Red-tail which was apparently being "mobbed" by a score or more of crows. When the writer was almost within gunshot, the hawk started to fly, carrying a dark object which it dropped when shot at, and which proved to be a crow. The hawk escaped, but the crow, though not a shot had struck it, was so pierced both in the skull and thorax by the talons of the hawk that it soon died.

During the nesting season of the Black-crowned Night Herons (*Nycticorax n. naevius*) at Eagle lake, in Hancock county, while concealed in the shelter of some oaks where a colony of about two hundred pairs of these herons was located, the writer noticed on several occasions the commotion caused by the circling of either adult or young Red-tailed Hawks above the trees where nests containing young herons were numerous. The prolonged and startling Whaa!!! Whaa!!! uttered by every adult heron which sighted a hawk indicated that a dreaded marauder was near. The crows, however, menaced this heronry much more seriously, since they were ever ready to steal eggs whenever the nests were left unguarded.

VARIATION AND CHANGE OF PLUMAGE IN THE RED-TAILED HAWK.

It is interesting to note the range of variation among individuals of *borealis* and its subspecies. When hard and fast lines are laid down, there is always a specimen to be found which presents one or more characteristics warranting a place in at least two of the varieties.

While the typical *B. borealis* is to be found more abundantly east of the Mississippi, it occurs as a rather uncommon resident in eastern Iowa. An adult specimen of this species secured at Sioux City August 2, 1884 (No. 17490) is in the collection of the State University of Iowa. This bird was moulting at the time it was killed and both the partly grown rich chestnut-red tail feathers, as well as the rusty old ones have but a single well-defined subterminal black bar. The tibial flags are lightly washed with buff, but are unmarked. The lower tail coverts are white.

As for the variety "calurus," while typical specimens of a dark brown or chocolate brown color are not common anywhere in the

state, individuals with practically no clear white, but with rusty washing on the under parts and with rufous barring on the tibial flags are to be found; and a specimen of *calurus* taken in Johnson county, though of much lighter shade, has a more characteristically barred tail than a very dark specimen of *calurus* from California.

Specimens are at hand which at a glance present the characteristics of the eastern variety, but careful examination of the tail feathers (especially near the shafts of the lateral ones) will reveal traces of dark bars in addition to the subterminal one. Few specimens, however, which suggest at first sight the western variety, are without evident traces of more than the subterminal bar. Iowa seems to be a "melting pot" for the species and its varieties.

In the spring of 1915 a female bird in immature plumage was received from Allamakee county. This specimen is interesting when considered in conjunction with a hawk of the same species killed by the writer in July, 1902, at Clear lake, which was changing from immature to adult plumage. In this specimen most of the tail feathers are of the barred immature type, while some are of the red adult coloration with black subterminal band. One adult red feather is grown to only half its full length. It would seem that the Red-tailed Hawk does not pass into the adult plumage until the summer following the year in which the bird is hatched.

Albino Red-tailed Hawks are occasionally secured.

Typical Eastern Red-tailed Hawks do not appear to be common in eastern Iowa. Few specimens with white unmarked tibial flags and under tail coverts have been found. Intergradation with the western form is common, and birds are not easily placed under any restricted description. The varieties of this species range from Alaska to the islands beyond Florida and from New Foundland to eastern Mexico. Iowa is so located that these varieties, with the exception of the Alaskan form, come within its borders. There are in the Coe College Museum skins of the Eastern Red-tail and of its three varieties (viz., *krideri*, *calurus*, and *harlani*) all collected in Linn county.

Fig. 36—Map showing the distribution in Iowa of the Red-tailed Hawk.

This map represents the distribution as recorded in the literature noted in the appended bibliography. It also includes the observations of the writer and of those with whom he has communicated. That this represents accurately the eastern variety and its state distribution may well be doubted, since many do not carefully distinguish the varieties.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1		Keokuk.....	Dec. 22, '89		Mice.....		Fisher
2		Iowa City.....	Oct. 25, '01		Meadow mouse (A. pennsylvanica)	1 garter snake	18537 S. U. I Mus.
3		Clear Lake.....	July 9, '02				Empty
4		Cedar Rapids.....	Sept. 11, '03				Empty
5		Cedar Rapids.....	Oct. 2, '03				Empty
6		Cedar Rapids.....	Oct. 3, '04				Empty
7	Im.	Cedar Rapids.....	Oct. 5, '04		3 field mice	3 or 4 large grass- hoppers.	
8	Female.	Coggon.....					Empty
9		Cedar Rapids.....	Oct. 9, '04				Wt. 3½ lbs.
10		Cedar Rapids.....	Oct. 24, '04		1 mouse		Empty
11	Im. Male.	Cedar Rapids.....	Oct. 24, '04		Teeth of 2 mice and fur of others.		Variety, harlani
12		Cedar Rapids.....	Oct. 2, '04	Chicken bones and feathers.			Wt. 3¼ lbs.
13		Toledo.....	Oct. 25, '04		1 rodent.	Straws.	
14	Im. F'm.	Marshalltown.....	Oct. 28, '04	Remains of bird (gallinaceous)	Fur of rodent.	Straw.	Wt. 2 lb. 9½ oz. variety harlani
15		La Porte City.....	Nov. 1, '04		2 pocket gophers	Many grasshoppers 2 snakes	Wt. 2 ⅞ lb. Wt. 3¾ lb.
16	Im. Male.	Marshalltown.....	Nov. 1, '04				Wt. 3 lb.
17	Ad.	Louisa Co. Oakville.....	Nov. 2, '04	Chicken	5 field mice		Empty
18			Nov. 3, '04				Wt. 2 lb. 5½ oz.
19		Brooklyn.....	Nov. 3, '04				Empty
20		Cedar Rapids.....	Nov. 25, '04		2 field mice	1 locust.	Wt. 3 lb.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
21		Cedar Rapids	Dec. 19, '04				Empty variety Krideri
22	Female	Tama	Oct. 13, '05		Fur of rodent		Wt. 2¼ lb.
23		Oakville	Oct. 3, '05				Empty
24	Im. Fem.	Jefferson	Oct. 16, '05	Chicken feathers			
25		Cedar Rapids	Oct. 13, '05		Traces of small mam- mal	1 grasshopper	
26	Im.	Ruthven	Oct. 17, '05	Mass of chicken ... feathers and bones			Variety Krideri
27	Im. Male	Jefferson	Oct. 25, '05		Bones and fur of Medium sized rodent	1 grasshopper	Wt. 2 lb. 14 oz.
28		Cedar Rapids	Oct. 25, '05		1 gopher		
29	Im.	Solon	Oct. 31, '05		Rodent hair	52 grasshoppers 1 katydid	
30	Male	Solon	Nov. 1, '05			2 blades of grass 22 grasshoppers and remains of others	
31		Burlington	Nov. 3, '05			2 garter snakes, each 22 in. long	
32		New London	Nov. 6, '05				Empty
33	Female	Toledo	Nov. 24, '05		Small rodent	Straws	Empty
34		Cedar Rapids	Dec. 7, '05			Fragments of grass- hoppers.	Empty
35		Wheatland	Oct. 5, '06			1 garter snake	
36		Cedar Rapids	Nov. 8, '06				Empty
37	Ad. Male	La Porte City	Nov. 8, '06	Feathers and bill of chicken			
38		Cedar Rapids	Dec. 15, '05		Field mouse 1 small rodent	Frog legs (in crop)	

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
39			Aug. 26, '09	Small rooster			Empty
40		Boone	Oct. 28, '10				Variety
41		Iowa City	Oct. 24, '13		Small shrew	14 grasshoppers	Krideri
42		Iowa City	Nov. 1, '13			Body of a moth; fragments of a leaf and small nematodes	
43		Iowa City	Nov. 10, '13		Medium sized Mammal		
44		Iowa City	Nov. 14, '13	Teal Duck		Greenish mass not determined	Variety
45		Johnson Co.	Dec. 15, '13				Krideri
46		Johnson Co.	Oct. 21, '14		1 rodent	26 grasshoppers 1 beetle 2 small snakes 4 pieces of grass	
47		Iowa City	Nov. 5, '14		Small amount of Mammal hair	43 grasshoppers	
48		Iowa City	Nov. 7, '14		Small Mammal	85 grasshoppers 1 cricket	
49		Iowa City	Nov. 9, '14		Mass of hair	4 grasshoppers 1 large frog	
50		Des Moines	Dec. 14, '14		Small amount of hair		Empty
51		Johnson Co.	Dec. 14, '14				Variety
52		Iowa City	Oct. 18, '15			60 green bottle flies and fragments. 1 grasshopper	Krideri
53		Iowa City	Oct. 18, '15			11 grasshoppers 1 cray fish	

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
54		Iowa City					
55		Iowa City	Nov. 12, '15.		2 rodents	6 grasshoppers	
56		Iowa City	Nov. 11, '15.		1 small rodent	9 grasshoppers 1 small frog	
57		Manchester	Mch. 25, '16.				Empty
58	Male	Rockwell City	Oct. 12, '05		Small rodent		
59	Male		Oct. 17, '05		1 small mammal		
60	Male	Anthon	Oct. 25, '05		1 rodent (gopher?)	2 grasshoppers	
61		Iowa	Dec. 6, '85		Rabbit		No. 15906 S.U.I. Mus.
62	Female	Iowa City	Oct. 25, '01		Mouse (A. pennsylvanica)	1 garter snake	
63	Im. Fm.	Cedar Rapids	Oct. 22, '04	Chicken			
64	Male	Linn Co.	Oct. 25, '04		2 field mice	1 winged locust	
65	Female	Iowa City	Oct. 26, '16		Small mammal		
66	Female	Britt	Oct. 17, '16			Grasshopper fragments	
67	Female	Washington Co.	Oct. 22, '16		1 shrew (Blarina sp.)		
68	Im. Male	Iowa City	Nov. 14, '16	Bones and feathers of a chicken (?)			

Falco borealis (Gmel.), Syst. Nat., p. 266 (1789) (Original Description).

**Falco borealis* (Gmel.). Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie County.)

Falco borealis (Gmel.), Nuttall, Thos., Manual of the Ornithology of the United States and Canada, p. 102, 1832.

Falco borealis, Wilson, Alexander, and Bonaparte, Chas. Lucian, American Ornithology or the Natural History of the Birds of the U. S., p. 82, 1831.

**Falco borealis*, Allen, J. A., Notes on the Birds Observed in Western Iowa in the months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, p. 497, 1868.

Falco borealis, Samuels, E. A., Ornithology and Oology of New England, pp. 35-36, 1868.

Falco borealis, Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B., p. 424, 1870.

**Falco borealis*, Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur and Mahaska Counties.)

Falco borealis, Jordan, D. S., and Van Vleck, B. H., A Popular Key to Birds, Reptiles, Batrachians and Fishes of Northeastern United States, East of the Mississippi River, p. 28, 1874.

**Falco borealis*, Coues, E., Birds of the Northwest, pp. 352, 354, 1874.

Falco borealis, Batty, Jos. H.: Forest and Stream IV, p. 374, 1875.

Falco borealis, Baird, S. F., Brewer, T. M., and Ridgway, R., A History of North American Birds, p. 282, 1875.

Falco borealis, Henshaw, W. H., Explorations West of the 100th Meridian, Wheeler, Vol. V, p. 424, 1875.

Falco borealis: Forest and Stream, Vol. VI, p. 3, 1876.

Buteo borealis (Gm.) Vieill. Vennor, H. G., Our Birds of Prey or the Eagles, Hawks and Owls of Canada, pp. 45, 51, 1876.

Buteo borealis. Coues, E., Birds of the Northwest, p. 354, 1877.

Buteo borealis. Krider, Jno., Forty Years' Notes of a Field Ornithologist, p. 6, 1879.

**Buteo borealis*. Jones, Lynds, Bird Migration in the Mississippi Valley from Observations Collated by W. W. Cooke: Forest and Stream, Vol. 19, No. 16, p. 306, 1882. (Grinnell.)

**Buteo borealis*. Beal, F. E. L., Ibid. (Ames.)

**Buteo borealis*. Coues, E., New England Bird Life, p. 121, 1883.

Buteo borealis. Coues, E., Key to North American Birds, p. 544, 1884.

Buteo borealis. Rawson, Calvin: Ornithologist and Oologist, Vol. VIII, p. 17, 1883.

**Buteo borealis*. Preston, J. W., Hawk Notes: Ornithologist and Oologist, Vol. 10, No. 3, p. 35, 1885. (Baxter.)

**Buteo borealis*. Jay, James C., Under Correspondence: The Oologist, Vol. 3, No. 2, p. 27, 1886. (Des Moines.)

- **Buteo borealis*. Norris, J. Parker, A Series of Eggs of the Red-tailed Hawk: Ornithologist and Oologist, Vol. 11, No. 5, p. 68, 1886. (Baxter and Iowa City.)
- **Buteo borealis*. Preston, J. W., The Number of Eggs Laid by the Red-tailed Hawk: Ornithologist and Oologist, Vol. 11, No. 7, p. 102, 1886. (Baxter.)
- **Buteo borealis*. Jay, James C., The Great Horned Owl Eggs: The Hoosier Naturalist, Vol. 1, No. 4, p. 112, 1886. (Des Moines.)
- Buteo borealis*. Lloyd: Auk, Vol. IV, p. 188, 1887.
- Buteo borealis*. Warren, Dr. B. H., Birds of Pennsylvania, p. 86, 1888.
- **Buteo borealis*. Jay, James C., Under Oology: The Hoosier Ornithologist and Oologist, Vol. 1, No. 4, p. 59, 1888. (Des Moines.)
- Buteo borealis*. Cooke, W., Bird Migration in the Mississippi Valley, pp. 26, 27, 33, 111, 114, 115, 1888.
- **Buteo borealis*. Webster, E. B., Under Migration Notes: The Hoosier Ornithologist and Oologist, Vol. 1, No. 4, p. 63, 1888. (Cresco.)
- **Buteo borealis*. Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalog of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 127, 1888.
- **Buteo borealis*. Jones, Lynds, A List of Birds Found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- Buteo borealis*. Ridgway, R., Birds of Illinois, p. 465, 1889.
- Buteo borealis*. Cory, C. B., Birds of the West Indies, p. 197, 1889.
- *White, H. G., Geographical Variation of Eggs: Ornithologist and Oologist, Vol. 15, No. 1, p. 2, 1890.
- **Buteo borealis*. Kelsey, Carl, The Effect of Winter on the Arrival and Nesting of Birds in Grinnell, Iowa: Ornithologist and Oologist, Vol. 16, No. 1, p. 11, 1891.
- Buteo borealis*. Goss, N. S., History of the Birds of Kansas, p. 259, 1891.
- **Buteo borealis*. Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- **Buteo borealis*. Sheldon, Frank W., In Camp at Twin Lakes: Ornithologist and Oologist, Vol. 16, No. 10, p. 157, 1891.
- **Buteo borealis*. Balliet, Letson, *Buteo borealis* and Other Hawks: The Wisconsin Naturalist, Vol. 1, No. 7, p. 109, 1891. (Polk County and Des Moines.)
- **Buteo borealis*. Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Buteo borealis*. Hatch, Dr. P. L., Birds of Minnesota, p. 185, 1892.
- Buteo borealis*. Bendire, Capt. Chas., Life Histories of North American Birds, pp. 206-212, 1892.
- **Buteo borealis*. T. E. S., Iowa Notes: The Oologist, Vol. 11, No. 8, p. 199, 1892. (Council Bluffs.)
- **Buteo borealis*. Fisher, A. K., The Hawks and Owls of the United States:

U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bull. 3, p. 61, 1893.

**Buteo borealis*. Keyes, Charles Reuben, Notes and News: The Iowa Ornithologist, Vol. 3, No. 2, p. 24, April, 1893. (Blairstown.)

Buteo borealis. Keeler, Chas. A., Evolution of the Colors of North American Land Birds, pp. 150, 206, 269, 1893.

**Buteo borealis*. Savage, David L., Notes on the Birds of Henry County, Iowa: The Oologist, Vol. 10, No. 12, p. 325, 1893.

**Buteo borealis*. Jones, Lynds, Bird Migration at Grinnell, Iowa: The Auk, Vol. 12, p. 236, 1895.

**Buteo borealis*. Anderson, R. M., Owl Notes: The Nidologist, Vol. 2, No. 6, p. 80, February, 1895.

**Buteo borealis*. Irons, Ernest, Our Association: Iowa Ornithologist, Vol. 1, No. 3, p. 53, April, 1895.

**Buteo borealis*. Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.

**Buteo borealis*. Henning, Carl Fritz. The Red-tailed Hawk (*Buteo borealis*): The Iowa Ornithologist, Vol. 2, No. 3, pp. 66, 71, 1896. (Boone.)

**Buteo borealis*. Savage, Walter G., Under The Rambler Noticed: The Iowa Ornithologist, Vol. 2, No. 3, p. 75, 1896.

**Buteo borealis*. Anderson, R. M., A Hawk Diary: The Nidologist, Vol. 3, Nos. 10, 11, pp. 124-125, 1896. (Forest City.)

**Buteo borealis*. Crone, John V., Under Notes and News: The Iowa Ornithologist and Oologist, Vol. 2, No. 4, p. 86, 1896. (Winnebago.)

†*Buteo borealis*. Hegner, Robert W.: Oologist, p. 60. June, 1897. (Account of the Red-tailed Hawk.)

**Buteo borealis*. Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 7, 1897.

**Buteo borealis*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 3, 1897.

**Buteo borealis*. Hortinger, Clarence, The Red-tailed Hawk in Hardin County, Iowa: The Oologist, Vol. 14, No. 2, p. 28, 1897.

**Buteo borealis*. Savage, W. G., Some Notes on the Birds and Weather in Van Buren County, Iowa, March, 1897: The Iowa Ornithologist, Vol. 3, No. 2, pp. 26, 27, April, 1897.

**Buteo borealis*. Anderson, R. M., Nesting Habit of Krider's Hawk: The Iowa Ornithologist, Vol. 3, No. 3, p. 32, July, 1897. (Hancock county.)

**Buteo borealis*. Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 55, October, 1897. (Winneshiek and Allamakee Counties.)

Buteo borealis. Knight, O. W., A List of the Birds of Maine, p. 60, 1897.

**Buteo borealis*. Savage, W. G., Contents of an Owl's Nest: The Osprey, Vol. 1, No. 10, p. 136, 1897. (Hillsboro.)

**Buteo borealis*. Savage, David L., Birds of the Midland Region: The Midland Monthly, Vol. 7, p. 492. (Southern Iowa.)

- **Buteo borealis*. Henning, C. F., Notes and News: The Iowa Ornithologist, Vol. 4, No. 2, p. 13, April, 1898. (Boone.)
- Buteo borealis*. Evans, A. H., Birds, p. 166, 1899.
- Buteo borealis*. Cory, G. B., Birds of Eastern North America, p. 173, 1899.
- Buteo borealis*. Ridgway, R., Manual of North American Birds, p. 232, 1900.
- Buteo borealis*. Hornaday, W. T., The American Natural History, p. 229, 1904.
- Buteo borealis*. Woodruff, F. M., The Birds of the Chicago Area, p. 94, 1905.
- Buteo borealis*. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- †*Buteo borealis*. Hegner, Robert W., The Home Life of the Red-tailed Hawk: Bird Lore, VIII, pp. 151-157, 1906.
- Buteo borealis*. Wilson, B. H., Birds of Scott County, Iowa: The Wilson Bulletin, March, 1906, p. 3.
- Buteo borealis*. Widmann, Otto. A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, 1907, pp. 94-95.
- Buteo borealis*. Anderson, R. M., The Birds of Iowa, p. 247, 1907.
- Buteo borealis*. Macoun, Jno., and Macoun, Jas., Catalogue of Canadian Birds, p. 251, 1909.
- Buteo borealis*. Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 51, 1909.
- Buteo borealis*. A. O. U. Check List, 1910, p. 157.
- Buteo borealis*. Barrows, W. B., Michigan Bird Life, p. 270, 1912.
- Buteo borealis*. Pellett, F. C.: Proceedings of the Iowa Academy of Science, Vol. XIX, p. 199, 1912.
- †*Buteo borealis*. Pellett, Frank C., Food Habits of the Red-tailed Hawk, Cooper Hawk and Sparrow Hawk: Proc. Ia. Acad. Sci., XIX, pp. 199-201, 1912.
- †*Buteo borealis*. Pellett, Frank C., Friends and Foes of the Fruit Grower: Sixth Annual Report Missouri State Board of Agriculture, pp. 113-122, 1912. (Illus.)
- Buteo borealis*. Bunker, C. D., The Birds of Kansas, p. 147, 1913.
- Buteo borealis*. Chapman, F. M., Birds of Eastern North America, p. 295, 1914.
- Buteo borealis*. Burns, F. L., The Wilson Bulletin, Vol. XXVII, p. 283, March, 1915.

Fig. 37.—Krider's Hawk.

9A. *BUTEO BOREALIS KRIDERI* Hoopes. 337a

Krider's Hawk. Krider's Red-tail.

Field Characters.—Similar to the Eastern Red-tail, but lighter both above and below. A very light colored hawk.

Description.—Above showing much white on the back, the head still lighter, the white often predominating. Below, white with an indefinite belt of darker spots across lower breast. Tail pale red in adults, and in the immature with several blackish bars.

Measurements.—Within the range of those given for the Red-tailed Hawk.

Range.—From North Dakota and Minnesota south to Missouri, wintering southward. Accidental in Alaska.

The Krider's Hawk is but a light form of the Red-tailed Hawk. The type specimen of this species was taken in Winnebago county, Iowa, September, 1872, and while not to be considered common, it is now and again reported, and specimens are occasionally collected in the state.

It has been found nesting in several counties, and its breeding habits and food are in no way distinctive. Mr. Jasper Brown noted several mice in a nest containing two eggs, near Middle Amana, Iowa county, March 24, 1898.

A specimen of Krider's Hawk taken in Eagle, Alaska, was presented to the Coe College Museum (No. 336) by Rev. Dr. C. F. Ensign, who for some years was a missionary at that station. Hitherto it had not been found north of North Dakota.

The report of stomach contents of this form will be found listed with that of the Red-tailed Hawk, the variety being indicated.

Fig. 38.—Map showing the distribution in Iowa of Krider's Hawk.

Buteo Lacepede, *Tableaux Ois.*, 4, 1799. Type, by tautonymy, *Falco buteo* Linnaeus.

Falco borealis Gmelin, *Syst. Nat.*, I, i, 266, 1788. (Carolina.)

Buteo borealis var. *kriderii* Hoopes, *Proc. Acad. Nat. Sci. Phila.*, 1873, 238, pl. 5. (Winnebago County, Iowa.)

Buteo borealis *krideri* Hoopes.

- **Buteo borealis kriderii* Hoopes. Ridgway, Robert, A Manual to North American Birds, p. 232, 1887.
- **Buteo borealis kriderii* Hoopes. Cooke, W. W., Report on the Bird Migration in the Mississippi Valley, 1884-1885: U. S. Department of Agriculture, Division of Economic Ornithology, Bull 2, p. 115, 1888.
- **Buteo borealis kriderii* Hoopes. Goss, N. S., History of the Birds of Kansas, p. 261, 1891.
- **Buteo borealis kriderii*. Balliet, Letson, *Buteo borealis* and Other Hawks: The Wisconsin Naturalist, Vol. 1, No. 7, p. 109, 1891. (Des Moines.)
- **Buteo borealis kriderii* Hoopes. Bendire, Capt. Chas., Life History of the Birds of North America, Vol. 1, pp. 212, 213, 1892.
- **Buteo borealis kriderii* Hoopes. A. O. U. Check List, 2d Edition, p. 130, 1895.
- **Buteo borealis kriderii* Hoopes. Ridgway, Robert, A Manual to North American Birds, 3d Edition, p. 231, 1896.
- Buteo borealis kriderii*. Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 7, 1897.
- Buteo borealis kriderii*. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Buteo borealis kriderii*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist Vol. 3, No. 1, p. 1897.
- Buteo borealis kriderii*. Anderson, R. M., Nesting Habit of Krider's Hawk: The Iowa Ornithologist, Vol. 3, No. 3, pp. 31, July, 1897. (Winnebago and Hancock Counties.)
- Buteo borealis kriderii* Hoopes. Widmann, Otto, A Preliminary Catalog of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, 1907, pp. 95-96.
- Buteo borealis krideri* Hoopes. Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 51, 1909.
- Buteo borealis krideri* (Hoopes). Bunker, C. D., The Birds of Kansas, p. 147, 1913.

9B. *BUTEO BOREALIS CALURUS* Cassin. 337b.

Western Red-tail.

Field Characters.—Dark colored Red-tailed hawks showing much red and rusty whitish beneath. Darker but otherwise like the Eastern Red-tail.

Description.—Above showing very little light color, sometimes sooty; the white of the Eastern Red-tail replaced by buffy, rusty, or dusky shades. Legs with rufous barring and tail having usually several more or less distinct black bars on the red background. Intergrading specimens are common.

Measurements.—About as in the Eastern Red-tail.

Range.—Western United States generally, extending eastward to the western part of the plains region. Casually reaching Iowa and Illinois.

This darker western form of the Red-tailed Hawk is taken occasionally in Iowa not only in the western part, but in the eastern as well.

It has been found nesting in the state, but aside from the color of the birds there is nothing to distinguish it from the other varieties which may be found in the same region. The contrast in color between a typical Red-tail of the eastern type, and this western form, in a well-marked specimen is pronounced, but intergradations seem to be the rule rather than the exception.

The stomach contents of this form will be found listed with that of the Red-tailed Hawk, the variety being indicated.

Fig. 39.—Map showing the distribution in Iowa of the Western Red-tail.

Buteo Lacedepede, *Tableaux Ois.*, 4, 1799. Type, by tautonymy, *Falco buteo* Linnaeus.

Falco borealis Gmelin, *Syst. Nat.*, I, 1, 266, 1788. (Carolina.)

Buteo calurus Cassin, *Proc. Acad. Nat. Sci. Phila.*, VII, 281, 1855. (Near Fort Webster, Rio Mimbres, New Mexico.)

Buteo borealis calurus Cassin.

**Buteo borealis harlani*. Keyes, Charles Reuben, *The Iowan Raptors: The Iowa Ornithologist*, Vol. 3, No. 1, p. 3, 1897.

Buteo borealis calurus. Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, p. 96, 1907.

Buteo borealis calurus (Cassin). Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 51, 1909.

Buteo borealis calurus (Cass.). Bunker, C. D., The Birds of Kansas, p. 147, 1913.

Fig. 40.—Harlan's Hawk, or Black Red-tail.

9C. *BUTEO BOREALIS HARLANI* (Audubon). 337d.

Harlan's Hawk. Black Red-tail.

Field Characters.—A large blackish hawk *without a red tail*, and to be distinguished by no other special characters. More likely to be confused with dark forms of the Rough-legged Hawk than with any others.

Description.—Above, dusky or sooty, the tail mottled with black, whitish, and some red. Below, whitish to dusky or sooty, in lighter forms the lower breast showing more or less of a dark belt. Immature birds with barred tails.

Measurements.—Similar to the Eastern Red-tail.

Range.—Southeastern United States, casually coming to Nebraska, Iowa and Illinois. Breeds in Iowa.

This handsome species is not common in the state but is occasionally taken, and has been found breeding. At seasons of the year when the Rough-legged hawks are with us, dark individuals of the Rough-leg may be taken for Harlan's Hawks. In the hand, however, the completely feathered tarsi of the Rough-leg at once differentiates it from Harlan's Hawk which has the major part of the tarsi bare.

There is no distinguishable difference in the food or nesting habits of this subspecies. It intergrades with the Red-tail, and though well-marked individuals suggest a distinct species, no definite line of differentiation separating the two and leaving no specimens undetermined, can be drawn.

The report on the stomach contents of this form will be found listed with that of the Red-tailed Hawk, the variety being indicated.

Fig. 41.—Map showing the distribution in Iowa of Harlan's Hawk.

Buteo Lincepepe, Tableaux Ois., 4, 1799. Type, by tautonymy, *Falco buteo* Linnaeus.

Falco borealis Gmelin, Syst. Nat., I, i, 266, 1788. (Carolina.)

Falco harlani Audubon, Birds Amer. (folio), I, pl. 86, 1830. (Near St. Francisville, Louisiana.)

Buteo borealis harlani (Audubon).

- **Buteo harlani* (Aud.). Cooke, W. W., Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 115.
- **Buteo harlani* (Aud.). Ridgway, Robert, A Manual to North American Birds, p. 231, 1887.
- **Buteo harlani*. Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- **Buteo borealis harlani* (Audubon). Bendire, Capt. Chas., Life Histories of the North American Birds, Vol. 1, p. 217, 1892.
- **Buteo borealis harlani*. Fisher, A. K., The Hawks and Owls of the United States: U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bull. 3, p. 52, 1893.
- **Buteo borealis harlani* (Aud.). A. O. U. Checklist, 2d Edition, p. 131, 1895.
- **Buteo borealis harlani* (Aud.). Ridgway, Robert, A Manual to North American Birds, 2d Edition, p. 231, 1896,
- **Buteo borealis harlani*. Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 7, 1897.
- **Buteo borealis harlani*. Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 3, 1897.
- †*Buteo borealis harlani*. Keyes, Charles Reuben, Breeding of Harlan's Hawk in Iowa: Warbler, III, pp. 41-45, 1907. Illustrated.
- Buteo borealis harlani*. Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Buteo borealis harlani* (Aud.). Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, pp. 96-97, 1907.
- Buteo borealis harlani* (Aud.). Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 51, 1909.
- Buteo borealis harlani* (Aud.). Bunker, C. D., The Birds of Kansas, p. 147, 1913.

Fig. 42.—The Red-shouldered Hawk.

10. *BUTEO LINEATUS LINEATUS* (Gmelin). 339.

Red-shouldered Hawk. Chicken Hawk.

Hen Hawk.

Field Characters.—A medium large, reddish colored hawk, with white-banded wings and tail, frequenting timber, especially bottom-land near water.

Description.—Above, brownish, the feathers edged with reddish buff. Flight feathers black and white barred; shoulders of wings noticeably reddish. Tail black, with four or five conspicuous white bars. Below, tawny buff continuously barred with white.

Immature birds: Whitish below with streaks of dusky. Tail crossed by many narrow bars of buffy brown. Shoulders evidently reddish.

Measurements.—Length, 18 to 21 inches; wing, 12 to 14 inches; tail, 9 to 10 inches.

Range.—Eastern North America to the Plains, and from British America to the Gulf, breeding in its range, north of the Gulf States.

The Red-shouldered Hawk, while fairly common in parts of the state, is not conspicuous, since it has the habit of frequenting the

heavier timber and wooded bottom lands along our streams. This species is among the most handsomely marked of our Iowa birds of prey. Immature birds, though in other respects differing from the adults, show more or less of the characteristic red coloration of the shoulders.

Professor Charles R. Keyes has found it nesting during April on the Cedar river bottoms near Mount Vernon, and together with Mr. Jasper Brown of Norway has found them frequenting similar haunts along Iowa river in the Amana colony.

Mr. Brown collected two sets of four eggs each and one of five, on April 7, 11 and 9, respectively. In each instance the nest was in an oak tree, at the average height of forty feet, and was composed of sticks, twigs, bark, etc., and lined with grass, dry leaves and feathers. The nest examined April 7 contained a frog and a snake.

R. M. Anderson considers it "rare in the northern portion, and not reported from the western part of the state," but much more common, though frequently unobserved, in southeastern Iowa.

Many authors refer to the attachment of this hawk to its nesting site, and to its habit of laying supplemental sets if the first eggs are taken.

The bill of fare of the Red-shouldered Hawk includes earthworms, insects, crayfish, fish, frogs, reptiles, birds, and mammals of the humbler sort. The species is unquestionably of economic value to the state.

Fig. 43.—Map showing the distribution in Iowa of the Red-shouldered Hawk.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Male	Iowa City	Sept. 9, '14	Feather		Grasshopper, beetle, dragon fly and other insect remains.	
2		Wheatland	Oct. 5, '06			1 garter snake (1 foot long.) grasshoppers.	
3	Female	Iowa			Rabbit (small rodent)	Grasshoppers.	
4	Male	Iowa City	Sept. 17, '16		Fur of small rodent.		

Buteo lineatus lineatus (Gmelin).

*Say, Thomas, In Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie County.)

*Allen, J. A., Notes on the Birds Observed in Western Iowa in the months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, p. 499, 1868.

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

*Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural Sciences, Vol. 15, p. 242, 1872. (Decatur and Mahaska Counties.)

*Jay, James C., Great Horned Owl Eggs: The Hoosier Naturalist, Vol. 1, No. 7, p. 112, 1886. (Des Moines.)

Warren, B. H., Birds of Pennsylvania, p. 87, 1888.

*Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 127, 1888.

Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, p. 52, March, 1889.

Ridgway, R., Ornithology of Illinois, p. 472, 1889.

*Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.

Goss, N. S., History of the Birds of Kansas, p. 264, 1891.

*Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.

Hatch, Dr. P. L., Birds of Minnesota, p. 188, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 219, 1892.

*Savage, David L., Notes on the Birds of Henry County, Iowa: The Oologist, Vol. 10, No. 12, p. 325, 1893.

*Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 1, p. 3, 1897.

*Savage, W. G., Some Notes on the Birds and Weather in Van Buren County, Iowa, March, 1897: The Iowa Ornithologist, Vol. 3, No. 2, p. 26, April, 1897.

*Bartsch, Paul, Summer Birds of the Oneota Valley, (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 55, October, 1897. (Wineshiek County.)

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Widmann, Otto, A Preliminary Catalog of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, 1907, p. 97.

Anderson, R. M., The Birds of Iowa, p. 249, 1907.

Woodruff, F. M., Birds of the Chicago Area, p. 95, 1907.

Cory, C. B., *Birds of Illinois and Wisconsin*, p. 464, 1909.

Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 51, 1909.

A. O. U. Check List, 1910, p. 158.

Chapman, F. M., *Birds of Eastern North America*, p. 296, 1912.

Bunker, C. D., *The Birds of Kansas*, p. 147, 1913.

†Gabrielson, Ira N., *Some Marshalltown, Iowa, Notes*: *Auk*. XXXI, pp. 255-6, 1914.

11. *BUTEO SWAINSONI* Bonaparte. 342.

Swainson's Hawk. Big Chicken Hawk.

Field Characters.—A large brownish hawk with banded tail, white throat and belly, and conspicuous *reddish buff breast*.

Description.—Above, dusky brown; feathers edged with buff. Tail grayish with many dusky bars. Below, whitish or buffy, with dusky or rusty streaks or spots; the breast conspicuously reddish buff or brownish; the throat white.

Immature birds with more buff or reddish buff above. Below, light buff with dark streaks and spots.

Measurements.—Length, 20 to 22 inches; wing, 15 to 17 inches; tail, 8 to 10 inches.

Range.—Most of North and South America, breeding in most parts of its North American range.

During the past twenty years or more, while the writer has examined in the flesh many Iowan Raptores, there has never come to hand an adult specimen of Swainson's Hawk. This experience, however, I do not believe to be a fair index to its numbers in the state. Others have been more fortunate, Professor Charles R. Keyes having collected a set of eggs May 10, 1892, near Norway, that were laid in an old hawk's nest fitted up and lined with strips of bark, green twigs and feathers, and situated fifty feet up in a white oak. R. M. Anderson writes, "It is fairly well distributed over Iowa as a migrant and nests from the central to the northern portion of the State. The Swainson's Hawk nests somewhat later than the Red-tail, in the early part of May in northern Iowa. The nest is built in the small remnants of native groves, or moderately timbered tracts, and the birds seem quite careless about its concealment. Almost invariably fresh sprigs of green leaves are found in nests containing eggs."

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Female.....	Britt.....	May 11, '11 .....	.....	.....	Wings and legs of beetle (c. callidum)	
2	.....	Duncan	Sept. 1, '13.....	.....	.....	2 small grasshoppers....	

Buteo swainsoni Bonaparte.

Baird, Brewer & Ridgway, *Birds of North America, Land Birds*, Vol. 3, p. 266, 1874.

Preston, J. W., *Hawk Notes: Ornithologist and Oologist*, Vol. 10, No. 3, p. 35, 1885. (Baxter.)

Jones, L. and Parker, H. W., in W. W. Cooke's *Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology*, Bull. 2, p. 116, 1888. (LaPorte City and Newton.)

Peck, G. D., H. E. and Morton, *Ibid.* (La Porte City.)

Preston, J. W. *Ibid.* (Newton.)

Jones, Lynds, *A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew*, Vol. 1, No. 6, p. 62, March, 1889.

Ridgway, R., *Ornithology of Illinois*, p. 474, 1889.

Keyes, Charles Rollins, and Williams, H. S., M. D., *Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences*, Vol. 5, p. 127, 1888.

Kelsey, Carl, *Birds of Poweshiek County, Iowa: Ornithologist and Oologist*, Vol. 16, p. 132, 1891.

Goss, N. S., *History of the Birds of Kansas*, p. 265, 1891.

Jones, Lynds, in Bendire's *Life History of the North American Birds*, Vol. 1, p. 239, 1892. (Grinnell.)

Hatch, Dr. P. L., *Birds of Minnesota*, p. 189, 1892.

Preston, J. W., *Ibid.* (Baxter.)

Bendire, Capt. Chas., *Life Histories of North American Birds*, p. 236, 1892.

Osborn, Herbert, *A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College*, p. 7, 1892.

Fisher, A. K., *Hawks and Owls of the United States*, p. 72, 1893.

Anderson, R. M., *A Hawk Diary: The Nidologist*, Vol. 3, Nos. 10, 11, pp. 124-5, 1896. (Forest City.)

Anderson, R. M., *Birds of Winnebago and Hancock Counties, Iowa*, p. 7, 1897.

Keyes, Charles Reuben, *The Iowan Raptores: The Iowa Ornithologist*, Vol. 3, No. 1, p. 4, 1897.

Anderson, R. M., *Nesting Habit of Kriders Hawk: The Iowa Ornithologist*, Vol. 3, No. 3, pp. 31, 32, July, 1897. (Winnebago County.)

Brown, Jasper, *Action of a Great Horned Owl: Popular Science News*, Vol. 32, p. 257, November, 1898.

Bailey, B. H., *Two Hundred Wild Birds of Iowa*, p. 62, 1906.

Anderson, R. M., *Birds of Iowa*, p. 250, 1907.

Woodruff, F. M., *Birds of the Chicago Area*, p. 96, 1907.

Widmann, Otto, *A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis*, pp. 97, 98.

Fig. 45.—The Broad-winged Hawk, showing the wing expanse.

Fig. 46.—Another view of the Broad-winged Hawk.

Cory, C. B., *Birds of Illinois and Wisconsin*, p. 465, 1909.

Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 51, 1909.

A. O. U. Check List, 1910, p. 159.

Chapman, F. M., *Birds of Eastern North America*, p. 298, 1912.

Bunker, C. D., *The Birds of Kansas*, p. 147, 1913.

12. *BUTEO PLATYPTERUS* (Vieillot). 343.

Broad-winged Hawk.

Field Characters.—A medium-sized brownish hawk with conspicuously banded tail. A rather unwary hawk, found either in woods or meadows.

Description.—Above, brownish, darker on the back. Tail dark, with about four light bands. Below, heavily barred with brownish or rusty buff. Throat streaked with black; belly whitish.

Immature: Back dusky; under parts with dusky spots and streaks on a white or buffy background. Tail with several more or less distinct bands.

Measurements.—Length, 15 to 18 inches; wing, 10 to 11 inches; tail, 7 to 8 inches.

Range.—From eastern British America to the Gulf, wintering from middle United States southward.

The Broad-winged Hawk fills a somewhat unique position among the diurnal birds of prey in that it seems to be partial in its diet to the larvae of certain moths, etc., which do not appeal to the taste of other raptorial birds.

It has as little dash as any of our birds of prey, and is less suspicious than other hawks. It is to be seen perched in trees in rather dense second-growth timber, hopping about on sandy ground in pursuit of grasshoppers, or circling high in the air after the manner of other buzzard hawks. During migration it is more common than at other seasons of the year.

On September 22, 1911, Professor J. H. Scott, Mr. S. N. Harris and the writer witnessed a flight of Broad-winged Hawks near Cedar Rapids, which must have numbered between two and three thousand individuals of this species, besides a few Cooper's, Marsh, Red-tailed, and one Harlan's Hawk which we identified. These birds were so numerous at times, and so closely assembled as to suggest a swarm of gnats. The stomach of a Broad-wing shot at the time contained

insect remains, chiefly beetles. Later in the day the stragglers of this flock were noted feeding along the grasshopper-infested sandbars of Cedar river.

By far the greater number of specimens that have come to hand have been immature birds.

It is related that Audubon once removed a Broad-wing from the nest, carefully measured and sketched it, then released it without the bird's having given the least evidence of irritability.

An immature bird of this species was brought to me, and was taken in hand, posed on several perches, its plumage arranged. It even allowed the full spreading of one wing while being photographed, without resentment.

Captain Bendire in summarizing its breeding habits says, "It is a late breeder; in the more southern portion of its range nidification begins about the second week in April and correspondingly later northward. In the New England states, northern New York, Pennsylvania, Iowa and Minnesota generally in the latter half of May; and in New Brunswick and the southern portions of Canada about the beginning of June and sometimes later. Incubation lasts twenty-one to twenty-five days, and the eggs are deposited at intervals of one or two days. Both parents assist in incubation and in the care of the young. A single brood is raised in a season."

Rarely sets of four eggs are taken, two or three being the rule. A set of two eggs taken at Duluth, Minnesota, measure respectively 2.20 by 1.73 inches and 2.07 by 1.65 inches, and are soiled whitish in ground color with both bold and subdued spots of chocolate brown and lilac tending to become confluent at the smaller end of each egg.

Mr. Frank L. Burns in his "Monograph of the Broad-winged Hawk" gives the summary of the food of this species as ascertained by several observers. In 115 stomachs examined, 11 contained birds; 31, mice; 17, other mammals; 17, reptiles; 22, batrachians; 45, insects; 10, crayfish; 2, spiders; 1, thousand-legs; 2, earthworms; and 7 were empty.

Fig. 47.—Map showing the distribution in Iowa of the Broad-winged Hawk.

Buteo platypterus. (Vieillot).

Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie County.)

Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural Sciences, Vol. 15, p. 242, 1872. (Decatur and Mahaska Counties.)

Ridgway, R., Description of a Melanistic Specimen of *Buteo latissimus*: Proceedings of the U. S. National Museum, Vol. 10, pp. 248-249, 1886. (Clear Lake.)

Cooke, W. W., Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 116.

G. D., H. E. and Morton Peck. Ibid. (LaPorte City.)

Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 127, 1888.

Ridgway, Robert, Ibid. (Crystal lake, Hancock County.)

- Warren, B. H., *Birds of Pennsylvania*, p. 89, 1888.
- Jones, Lynds, *A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew*, Vol. 1, No. 6, p. 52, March, 1889.
- Ridgway, Robert, *Ornithology of Illinois*, p. 476, 1889.
- Kelsey, Carl, *Birds of Poweshiek County, Iowa: Ornithologist and Oologist*, Vol. 16, p. 132, 1891.
- Goss, N. S., *History of the Birds of Kansas*, p. 267, 1891.
- Bendire, Capt. Chas., *Life Histories of North American Birds*, p. 241, 1892.
- Osborn, Herbert, *A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College*, p. 7, 1892.
- Hatch, Dr. P. L., *Birds of Minnesota*, p. 190, 1892.
- Trostler, Isador S., *A tramp through Woods and Marshes of Eastern Iowa: The Oologist*, Vol. 9, No. 9, p. 210, 1892.
- Fisher, A. K., *Hawks and Owls of the U. S.*, p. 79, 1893.
- Anderson, R. M., *A Hawk Diary: The Nidologist*, Vol. 3, Nos. 10, 11, p. 124, 1896. (Forest City.)
- Anderson, R. M., *Birds of Winnebago and Hancock Counties, Iowa*, p. 7, 1897. (Lake Mills.)
- Keyes, Charles Reuben, *The Iowan Raptores: The Iowa Ornithologist*, Vol. 3, No. 1, p. 4, 1897.
- Bartsch, Paul, *Summer Birds of the Oneota Valley*, (June, July, 1895): *The Iowa Ornithologist*, Vol. 3, No. 4, p. 55, October, 1897. (Winnebask and Allamakee Counties.)
- Bailey, B. H., *Two Hundred Wild Birds of Iowa*, p. 62, 1906.
- Anderson, R. M., *Birds of Iowa*, p. 251, 1907.
- Woodruff, F. M., *Birds of the Chicago Area*, p. 96, 1907.
- Widmann, Otto, *A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis*, 1907, pp. 98, 99.
- Cory, C. B., *Birds of Illinois and Wisconsin*, p. 467, 1909.
- Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 51, 1909.
- A. O. U. Check List, 1910, p. 159.
- †Burns, Frank L., *A Monograph of the Broad-winged Hawk (Buteo platypterus): Wils. Bull. XXIII*, pp. 143-320, 1911.
- Chapman, F. M., *Birds of Eastern North America*, p. 298, 1912.
- †Bailey, B. H., *The Occurrence of Melanism in the Broad-winged Hawk (Buteo latissimus): Proc. Ia. Acad. Sci.*, XIX, pp. 191-192, 1912.
- †Bailey, B. H., *A Remarkable Flight of Broad-winged Hawks (Buteo latissimus): Proc. Ia. Acad. Sci.*, XIX, pp. 195-196, 1912.
- Bunker, C. D., *Birds of Kansas*, p. 147, 1913.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	.....	Cedar Rapids.....	Sept. 19, '05....	.....	.....	6 grasshoppers. 2 beetles.....	
2	.....	Cedar Rapids.....	Sept. 21, '05....	.....	.....	11 moth larvæ Several grasshoppers.....	
3	.....	Britt.....	Aug. 30, '13....	.....	1 rodent (mouse)	1 frog..... 5 grasshoppers.....	
4	Im.?	Coggon.....	Sept. 29, '04....	.....	Mammal (small)	1 beetle.....	
5	Female?	Coggon.....	Sept. 14, '04....	.....	.....	15 grasshoppers.....	
6	Male.....	Cedar Rapids.....	Sept. 25, '06....	.....	.....	8 grasshoppers.....	
7	?	Britt-Eagle Lake.....	Fall, 1907.....	.....	.....	Frogs.....	Sub. sp. Buteo p. Iowensis
8	Male.....	Iowa City.....	Sept. 14, '13....	.....	.....	14 grasshoppers 3 crickets.....	
9	Female.....	Iowa City.....	Sept. 16, '13....	.....	.....	12 crickets 3 grasshoppers.....	
10	Male.....	Iowa City.....	Sept. 17, '13....	.....	2 small rodents.....	21 crickets 11 grasshoppers.....	
11	Female.....	Iowa City.....	.....	.....	.....	8 grasshoppers Several beetles, (3 species).....	
12	Male.....	Iowa City.....	Oct. 13, '15....	.....	.....	1 spider 6 larvæ (beetles?).....	
13	Male.....	Iowa City.....	Sept. 29, '15....	.....	.....	1 dung beetle 1 insect head.....	
14	Female.....	Iowa City.....	Sept. 27, '15....	.....	.....	4 beetles 1 fly larva 1 beetle (?) larva.....	
15	Female.....	Iowa City.....	Sept. 27, '15....	.....	.....	Fragments of beetles.....	
16	Male.....	Cedar Rapids.....	July 9, '14.....	.....	Hair (rodent?)	1 ground beetle 1 mud wasp.....	
17	Im.....	Charles City.....	Sept. 19, '14....	.....	.....	4 garter snakes 1 caterpillar.....	
18	.....	Cedar Rapids.....	Sept. 13, '04....	.....	Mice.....	Grasshoppers.....	
19	Male.....	Iowa City.....	Sept. 26, '16....	.....	1 mouse.....	2 tomato worms 3 small frogs.....

Fig. 48.—Iowa Broad-winged Hawk (Photo by Mr. Wesley F. Kubichek).

12A. *BUTEO PLATYPTERUS IOWENSIS* Sub-sp. Nov.

Iowa Broad-winged Hawk.

Field Characters.—A medium-sized hawk appearing entirely black. It may be seen together with the ordinary Broad-winged Hawks.

Description.—Feathers of the entire bird in general sooty brown with a slightly rufous cast, the back and top of the head somewhat darker. Concealed bases of head and nape feathers snow white. Lining of wings in general same color as body. Whitish barring noticed on the under surface of primaries and secondaries. Exposed surface of tail with three dark bars, and two narrower grayish white bars, and narrow whitish tip.

Immature: With more rufous, especially on breast; tail crossed by five dark and four slightly lighter bars; tail lighter below.

Measurements.—Length, 16.50 to 18 inches; wing, 11 to 11.62 inches; tail, about 7 inches.

Range.—From Winnipeg and Portage la Prairie southward through Minnesota to central and southern Iowa (Des Moines and Iowa City); Virginia (?).

This dark form, so far as our present knowledge of its habits extends, differs in no respects from the common Broad-wing. Of the type specimen Mr. Ward wrote, "The bird was sitting in a tree, but started to fly when we came upon it. It was alone." The stomach of this bird contained a partly digested frog, and the crop held the fore-foot of a frog.

No records of its nesting habits have been published.

Buteo platypterus iowensis Sub sp. Nov.

Ridgway, R., Proc. U. S. Nat'l. Museum, Vol. IX, pp. 248-249, October, 1886.

Keyes, Charles Rollin, and Williams, H. S., Preliminary Annotated Catalogue of the Birds of Iowa: Proc. Davenport Acad. Nat. Sci., Vol. 5, p. 127, 1888.

Anderson, R. M., Birds of Iowa, p. 251, 1907.

Burns, Frank L., The Wilson Bulletin, Vol. XXIII, Nos. 3 and 4, 1911.

Bailey, B. H., The Occurrence of Melanism in the Broad-winged Hawk,

(*B. latissimus*): Proc. Ia. Acad. of Sci., XIX, pp. 191-192, 1912.

Bailey, B. H., The Auk, Vol. XXXIV, pp. 73-75, January, 1917.

Fig. 49.—Map showing the distribution in Iowa of the Iowa Broad-winged Hawk.

Genus *Asturina* Vieillot.13. *ASTURINA PLAGIATA* Schlegel: 346.

Mexican Goshawk.

Field Characters.—A medium sized, ashy-gray hawk, with white at the base of the tail.

Description.—"Above, deep ashy-gray, top of head and back of neck with five blackish shaft streaks; tail black, tipped with white, and crossed by two or three narrow bands of white; feathers covering base of tail white; below, white, very regularly barred with ashy, the stripes being farther apart on the flanks and belly." (Fisher.)

Measurements.—Length, 16 to 18 inches; wing, 9.50 to 11.70 inches; tail, 6.70 to 8.20 inches (Fisher).

Range.—"Southern Arizona and lower Rio Grande Valley south to Costa Rica; winters south of the United States; accidental in southern Illinois." (A. O. U. Check List, 1910.) Also accidental in Iowa. (W. G. Savage.)

Fig. 50.—Map showing the distribution in Iowa of the Mexican Goshawk.

The Mexican Goshawk is a rare straggler from the Southwest. It was seen in southern Illinois by Mr. Robert Ridgway. (Ornithology of Ill., p. 463, 1889.)

A single instance of its occurrence is recorded by R. M. Anderson

in *The Birds of Iowa*, p. 251, 1907. The capture was made by Walter G. Savage, in Van Buren county on Big Cedar creek, May 25, 1895.

The chief interest in this species lies in its having been taken in Iowa so far from its usual range. Doubtless other species quite as rare have remained unrecorded for Iowa because they were unrecognized.

Asturina plagiata Schlegel.

Ridgway, Robert, *Ornithology of Illinois*, p. 463, 1889.

Bendire, Capt. Chas., *Life Histories of North American Birds*, p. 251, 1892.

Fisher, A. K., *Hawks and Owls of the U. S.*, p. 85, 1893.

Savage, Walter G., *Under Notes and News: The Iowa Ornithologist*, Vol. I, No. 4, p. 89. (Van Buren County.)

Anderson, R. M., *Birds of Iowa*, p. 251, 1907.

Cory, C. B., *Birds of Illinois and Wisconsin*, p. 469, 1909.

Genus *Archibuteo* Brehm.

Subgenus *Archibuteo*

14. *ARCHIBUTEO LAGOPUS SANCTI-JOHANNIS*

(Gmelin). 347a.

Rough-legged Hawk. Black Hawk. St. John's Hawk.

Field Characters.—This hawk occurs in *two phases*, the *light* and the *dark*. The light phase is to be recognized by a conspicuous *dark belt* across the belly and thighs. The basal part of the tail, the legs, and in part the head are whitish. In the darker phase the bird is *uniformly brownish, black* or *sooty*. They are birds of the open fields or marsh land, and are not found in the state during the summer.

Description.—Above, dusky with tawny or buff edgings to the feathers of the back and upper wings. Head noticeably lighter than back; basal part of tail whitish, the remainder blackish or banded. Below, white or buffy-white streaked with black, the markings forming a distinct belt across the belly including the thighs. *Legs feathered completely to the toes*. In the dark phase, more or less uniformly black or brownish black.

Measurements.—Length, 20 to 23 inches; wing, 16 to 18 inches; tail, 9 to 11 inches.

Fig. 51. — Rough-legged Hawks, dark phase, male, above; light phase, female, below.

Range.—North America above Mexico; breeding north of the United States, and wintering in most parts of the United States.

The Rough-legged Hawk is a fairly common species throughout the state during the late fall, winter and early spring months. Through several years of observation I am confirmed in the belief that they are more abundant in November, and again late in February and in the first half of March, than during the midwinter season.

These hawks begin to appear with the early snows; and, as the ground becomes more deeply and continuously covered, they move southward in the main, comparatively few remaining if the winter be severe.

When the spring thaws bring conditions similar to those of late autumn, they return, but in numbers not so apparent, either because they are more wary through experience with the nimrods of regions farther south, or perhaps because a more rapid northward migration gives us less time for observation. The majority of our specimens of the Rough-leg secured in various parts of Iowa, have been taken in November, and about two-thirds of them are of the dark or melanistic plumage.

The conspicuous dark tipped wings and belted body enable one to identify this species considerably beyond gun range.

These hawks are seen skirting timber-lands, but not frequenting the woods. They prefer open prairies and wet meadows. Their methods of feeding are first by "watchful waiting." The bird quietly perches upon a stump or post not far above the ground and there awaits the appearance of a field mouse, shrew, or other small ani-

Fig. 52.—Rough-legged Hawk, dark phase.

mal, upon which it descends without dash or evident spirit. The second method simulates that of the Marsh Hawk. Coursing back and forth over the field or along the margin of the slough, the Rough-leg drops easily upon such small prey as it may find, often hunting very late in the evening, its crepuscular habits characterizing it as the most nocturnal of our diurnal birds of prey.

The food of the Rough-legged Hawk is such as to warrant us in calling it one of the farmer's best friends. Though it does not re-

main to continue its good offices during the summer months, it does much good during the colder seasons. Although some writers accuse this hawk of killing ducks and other wild fowl, there is nothing in my observations to sustain these statements. Mice seem to be a staple article of diet, and its continuous warfare upon such vermin ought to result in the protection it so much deserves.

A. K. Fisher reports that "of 49 stomachs examined, 40 contained mice . . ." Captain Bendire regards the records of the nesting of this species in the United States as questionable.

Fig. 53.—Rough-legged Hawk, light phase.

Archibuteo lagopus sancti-Johannis (Gmel.).

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

*Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 132, 1872. (Decatur and Mahaska Counties.)

Warren, B. H., Birds of Pennsylvania, p. 92, 1888.

Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 127, 1888.

Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. I, No. 6, p. 52, March, 1889.

Ridgway, R., Ornithology of Illinois, p. 478, 1889.

*Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and

Oologist, Vol. 16, p. 132, 1891.

Goss, N. S., History of the Birds of Kansas, p. 269, 1891.

*Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.

Hatch, Dr. P. L., Birds of Minnesota, p. 192, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 255,
1892

Keyes, Charles Reuben, The Iowan Raptore: The Iowa Ornithologist,
No. 3, p. 17, April, 1892.

Fisher, A. K., Hawks and Owls of the U. S., p. 86, 1893.

Shoemaker, Frank H., A Partial List of the Birds of Franklin County,
Iowa, July, 1896, p. 8.

*Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa,
p. 7. 1897. (Franklin County.)

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Wilson, B. H., The Wilson Bulletin, March, 1906, p. 3.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans.
Acad. of Sci. of St. Louis, 1907, p. 99.

Anderson, R. M., The Birds of Iowa, p. 251, 1907.

Woodruff, F. M., The Birds of the Chicago Area, p. 97, 1907.

Cory, C. B., Birds of Illinois and Wisconsin, p. 471, 1909.

Bruner, L., Wolcott, R. H., Swenk, M. H., Review of the Birds of Nebraska, p. 52, 1909.

A. O. U. Check List, 1910, p. 161.

Chapman, F. M., Birds of Eastern North America, p. 300, 1912.

Bunker, C. D., The Birds of Kansas, p. 147, 1913.

Fig. 54.—Map showing the distribution in Iowa of the Rough-legged Hawk.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Male.....	Iowa.....	Dec. 27, '14				Empty
2	Female.....	Osage.....	Dec. 24, '14				Empty
3	Male.....	Britt.....	Dec. 24, '14		Small mammal		
4	Male.....	Iowa.....	Nov. 23, '14		Small rodent		
5	Male.....	Marengo.....	Nov. 6, '05		2 shrews—3 rodents	Several grasshoppers	
6	Male.....	Gladbrook.....	Nov. 10, '05			2 large frogs	Empty
7	.....	Boone.....	Sept. —, '06				Empty
8	Male.....	Iowa.....	Nov. 10, '05				Empty
9	Male.....	Casey.....	Jan. 4, '06				Empty
10	Male.....	State Center.....	Nov. 1, '10		2 mice		
11	Male.....	Iowa.....	May 1, '07		Hair		
12	Male.....	Gladbrook.....	Nov. 13, '05		Several mice		
13	.....	Reinbeck.....	Nov. 25, '04		2 rodents (mice)

Fig. 55.—Ferruginous Rough-legged Hawk.

Subgenus *Brewsteria* Maynard.

15. *ARCHIBUTEO FERRUGINEUS* (Lichtenstein). 348.

Ferruginous Rough-leg. California Squirrel Hawk.

Field Characters.—A large reddish backed, white breasted hawk. Sluggish as compared with other hawks, and found hunting early and late in open fields.

Description.—Above, rufous, especially on the wings, the centers of the feathers dusky or brownish black; tail ashy white, the feathers edged with tawny. Below, white, with a few reddish streaks on the sides of upper breast and body. Legs sharply contrasting with other parts below, being reddish with numerous black bars, and feathered to the toes.

Measurements.—Length, 22 to 24 inches; wing, 16 to 18 inches; tail, 10 to 11 inches.

Range.—Western United States, wandering casually to Iowa, Wisconsin and Illinois.

This large hawk is conspicuously a bird of the open prairies of the west and comes only occasionally into Iowa, though it is sometimes taken east of the Mississippi. Dr. Elliott Coues is said to have regarded it as the "handsomest of the North American Falconidæ." The only specimen which I have ever seen that has been taken in Iowa is in the collection of the State Teachers' College at Cedar Falls.

Several authors have referred to it as nesting near Grinnell, but this record is denied by Mr. Lynds Jones, to whom Captain Bendire erroneously attributed the record. (Anderson, *Birds of Iowa*, p. 252, 1907.)

By those who have watched these birds closely, their flight when soaring at a great height is described as resembling that of the Golden Eagle; and when winnowing the air a short distance above the ground their flight simulates that of the Osprey.

Their food is mostly small mammals such as ground squirrels, field mice, and rabbits, and also reptiles.

Although, because of their infrequent visits to the state they are not an immediate economic factor, they probably play a part in limiting the range of injurious rodents which, unchecked, might reach our borders.

Archibuteo ferrugineus (Lichtenstein).

*Coues, E., *Key to North American Birds*, 3d Edition, p. 551, 1887.

*Jones, L., and Parker, H. W., in W. W. Cooke's *Report on the Bird Migration in the Mississippi Valley, 1884-85*: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 117. (Grinnell.)

Ridgway, R., *Ornithology of Illinois*, p. 481, 1889.

*Goss, N. S., *History of the Birds of Kansas*, p. 271, 1881.

*Kelsey, Carl, *Birds of Poweshiek County, Iowa: Ornithologist and Oologist*, Vol. 16, p. 132, 1891.

*Coues, E., *Key to North American Birds*, 4th Edition, p. 551, 1892.

Hatch, Dr. P. L., *Birds of Minnesota*, p. 194, 1892.

*Bendire, Capt. Chas., *Life Histories of North American Birds*, Vol. 1, p. 259, 1892.

Fisher, A. K., *Hawks and Owls of the U. S.*, p. 91, 1893.

Keyes, Charles Reuben, *The Iowan Raptores: The Iowa Ornithologist*, Vol. 3, No. 2, p. 17, April, 1897.

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri:
Trans. Acad. Sci., St. Louis, pp. 99-100, 1907.

Anderson, R. M., Birds of Iowa, p. 252, 1907.

Cory, C. B., Birds of Illinois and Wisconsin, p. 469, 1909.

A. O. U. Check List, p. 161, 1910.

Chapman, F. M., Birds of Eastern North America, p. 300, 1912.

Fig. 56.—Map showing the distribution in Iowa of the Ferruginous Rough-legged Hawk.

Fig. 57.—The Golden Eagle.

Genus *Aquila* Brisson.

16. *AQUILA CHRYSÆTOS* (Linnaeus). 349.

Golden Eagle.

Field Characters.—A bird of prey of the *largest size*; uniformly dark brown, except for the golden feathers on back of head. Bill, horn color; *legs feathered to the toes*.

Description.—Above and below brownish; feathers with a golden hue on nape of neck and back of head. Tail feathers often mottled, and with lighter color at the base.

Immature birds characterized by having about *half* of the *basal portion* of the *tail white*; the leg feathers also *lighter* in color.

Always distinguishable from the Bald Eagle by the feet, which are *feathered to the bases of the toes*.

Measurements.—Length, about 30 inches; wing, 23 to 26 inches; tail, 14 to 16 inches.

Range.—In North America from Alaska to Mexico and eastward even as far as Maine; more common in the western part of the United States. Straggling more or less regularly into Iowa.

The Golden Eagle is not a rare bird in Iowa, though not common at any place nor at any time.

Authors generally speak of its occurrence in this and neighboring states in the winter, but I incline to the belief, with Mr. R. M. Anderson, that the greater number of birds are observed during the early spring and late fall months.

N. S. Goss mentions the difference in spirit between the Golden and Bald Eagles in captivity, the former remaining untamed, while the latter becomes docile. He states that the former rejected food which was in the least tainted, while the latter bird ate such food unhesitatingly.

A beautiful Golden Eagle was captured about two miles west of Burr Oak, Iowa, in November, 1914. The bird had seized a full grown chicken in each foot; when, its claws becoming entangled in the meshes of some chicken wire, a boy drew the wire over the eagle so as to capture it.

The Golden Eagle has not been reported as nesting in Iowa. In the west, where it is common, it chooses a site on rugged cliffs rather than in trees, though the latter are occasionally utilized.

A. K. Fisher reports that "The food consists mainly of mammals and birds, of which spermophiles, rabbits, fawns, lambs, turkeys, grouse, waterfowl and other large birds form the principal part, though offal and carrion are sometimes taken."

In the sheep-grazing areas of the west, these eagles destroy considerable numbers of lambs, but in Iowa their depredations are chiefly confined to wildfowl and poultry. The numbers of rabbits, gophers, groundhogs and other rodents, however, destroyed in this section of its range, more than repay the farmer for protecting these noble birds.

Aquila chrysaetos (Linnaeus).

- *Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie County.)
- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Parker, H. W., Iowa Birds: The American Naturalist, Vol. 5, p. 169, 1871. (Poweshiek and Jasper Counties.)
- *Cooke, W. W., Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, pp. 117-118. (Central and Northern Iowa.)
- *George, F., Ibid, p. 118. (Williamstown.)
- Peck, G. D., H. E., and Morton, Ibid, p. 118. (La Porte City.)
- Warren, B. H., Birds of Pennsylvania, p. 93, 1888.
- Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 127, 1888. (Des Moines.)
- Ridgway, R., Ornithology of Illinois, p. 483, 1889.
- *Sheldon, Frank W., Brief Notes: Ornithologist and Oologist, Vol. 16, No. 5, p. 78, 1891. (Des Moines.)
- Goss, N. S., History of the Birds of Kansas, p. 273, 1891.
- *Thomson, A. V., Bald and Golden Eagles in Iowa: The Oologist, Vol. 8, No. 2, p. 31, 1891. (Decorah.)
- *Thomson, A. V., More about Iowa Eagles: The Oologist, Vol. 8, No. 8, p. 159, 1891. (Decorah.)

Fig. 58.—Map showing the distribution in Iowa of the Golden Eagle.

- Hatch, Dr. P. L., *The Birds of Minnesota*, p. 195, 1892.
- *Osborn, Herbert, *A Partial Catalogue of the Animals of Iowa represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College*, p. 7, 1892.
- Bendire, Capt. Chas., *Life Histories of North American Birds*, p. 263, 1892.
- *Fisher, A. K., *The Hawks and Owls of the United States: U. S. Department of Agriculture, Division of Ornithology and Mammalogy*, Bull. 3, pp. 93, 97, 1893.
- *Strode, Dr. W. L., *An Adventure with an Eagle: The Nidologist*, Vol. 1, pp. 9, 10, 1893. (Northern Iowa.)
- *Anderson, R. M., *Birds of Winnebago and Hancock Counties, Iowa*, p. 7, 1897.
- *Brown, H. J., *Notes and News: The Iowa Ornithologist*, Vol. 3, No. 2, p. 24, 1897. (Davenport.)
- Bailey, B. H., *Two Hundred Wild Birds of Iowa*, p. 62, 1906.
- Woodruff, F. M., *Birds of the Chicago Area*, p. 97, 1907.
- Anderson, R. M., *The Birds of Iowa*, p. 253, 1907.
- Widmann, Otto, *A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. St. Louis*, 1907, p. 100.
- Cory, C. B., *Birds of Illinois and Wisconsin*, p. 472, 1909.
- Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 52, 1909.
- A. O. U. Check List, p. 162, 1910.
- Chapman, F. M., *Birds of Eastern North America*, p. 301, 1912.
- Bunker, C. D., *The Birds of Kansas*, p. 147, 1913.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1		Keokuk.....	Oct. 31, '89.....				A. K. Fisher
2		Hancock Co.....			Rabbit.....	Several large frogs.....	R. M. Anderson son
3	Female.....	Coggon.....	Oct. 20, '15.....				Empty
4	Male.....	Dysart.....	Nov. 8, '15.....				Empty
5		Salina.....	Sept. 15, '14.....	Mass of feathers and bones.....		Grasshopper & straw ..

Fig. 59.—The Bald Eagle.

Genus *Haliaeetus* Savigny.

17. *HALIÆTUS LEUCOCEPHALUS LEUCOCEPHALUS*

(Linnaeus). 352.

Bald Eagle. White-headed Eagle.

Field Characters.—A bird of prey of the largest size. Adult bird having white head and tail. *Head never bald*. Body dusky.

Immature birds lack the white head and tail. *Legs not feathered to the toes at any age or in any plumage*.

Description.—Above, head, neck and tail, pure white; back and wings dusky or brownish. Bill and eyes yellow. Below, throat, neck and tail white; body, brown or dusky.

Immature birds are without the white head and tail, being uniformly brownish or dusky. Bill dark, and eyes brown. In any plumage the legs and feet are *feathered only part way to the bases of the toes*.

Measurements.—Length, 32 to 36 inches; wing, 22 to 24 inches; tail, 12 to 15 inches.

Range.—United States in general, found breeding in suitable localities.

While the Bald Eagle is a noble bird when in full flight, or perched on some lofty eminence, his habits and general character at times do not sustain the ideal which the public entertains with regard to him. A persecutor of the industrious Osprey, and an invader of the chicken yard, he is more often taken while perpetrating some such misdemeanor, than in his more dignified and sublime moments.

Though remaining occasionally through the winter, the early spring days which witness the breaking up of the ice in the larger water courses and the northward movement of the wildfowl, find the Bald Eagle migrating northward, ever on the lookout for fish or other food whether living or decayed.

On one occasion while the writer was floating down Red Cedar river in the latter part of March, he saw seven of these eagles in the course of the day, all of them being in the immature plumage.

We are indebted to Professor Charles R. Keyes, of Mount Vernon, Iowa, for the only authentic record that has come to hand of the nesting of the Bald Eagle in Iowa. "Mr. Arthur Jayne found a nest of this species the last of March, 1892, two and one-half miles northwest of Waubeek, Linn county. The nest was up 60 or 65 feet in a large bass-wood tree on the south side of the Wapsipinicon river, on a bluff overlooking the stream. The owner of the land said that the birds had nested there for years. Mr. Jayne got up to the nest but was unable to look fully into it. On the last visit both the old birds flew about, coming, he thought, as close as twenty-five or thirty feet. A week previously one old bird had remained on the nest while he had watched for some time from below and had made unsuccessful attempts to climb the tree. The nest was a very bulky affair, a regular 'wagon load' of sticks, some of them as large as one's wrist."

Though nesting much less frequently in Iowa than in former years, there is little doubt that the Bald Eagle still finds suitable nesting sites and hunting grounds in some parts of the state. The frequency of such names as Eagle Rock, and Eagle's Nest, in various localities in Iowa suggests that it was once not uncommon in this region.

The nest is usually described as a mass of sticks and other debris, sometimes six feet in diameter, varying in thickness according to the number of years it has been in use, and lined with grass, weeds, vines, etc. Trees rather than cliffs are preferred as nesting sites.

The eggs, which are usually two, rarely three in number, are whitish, soiled, and measure about 2.90 by 2.25 inches.

Stories relating the carrying of small children to the eyries of these great birds are to be generally discredited, the more careful writers giving credence to only one or two of the numerous published stories of this kind.

Mr. G. H. Berry has on several occasions observed the Bald Eagle in March feeding on dead fish, mainly carp, that were frozen in the ice of Cedar lake. within the city limits of Cedar Rapids.

Where fish can be secured this seems to be their chief diet; mammals, birds and offal constitute most of the remainder.

Fig. 60.—Map showing the distribution in Iowa of the Bald Eagle.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	..	Dows.....	.....	.....	.....	.....	.....
2	.....	Grundy Center.....	.....	Parts of a greater blue- bill duck.....	Muskrat.....	.....	.....
3	Im.....	Letts.....	June 12, '15.....	.....	.....	.....	Stomach Empty
4	Female.....	North English.....	Nov. 25, '16.....	.....	A piece of skin with hair (calf?).....	.....	.....

Haliaeetus leucocephalus leucocephalus (Linnaeus).

- *Say, Thomas, In Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie County.)
- *Maximilian, Prince zu Wied, (Weiskopfige Adler) Reise in das Innere Nord Americas. In den Jahren 1832-34. Vol. 1, p. 290, Coblenz, 1839.
- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Parker, H. W., Iowa Birds: The American Naturalist, Vol. 5, p. 169, 1871. (Poweshiek and Jasper Counties.)
- *Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur and Mahaska Counties.)
- *Mosher, A. A., The Fauna of Spirit Lake: Forest and Stream, Vol. 18, No. 4, p. 66, 1882.
- *W. H. R. (Andy Moore), Ducking at Waubonsie Lake: Forest and Stream, Vol. 19, No. 2, p. 27, 1882. (Glenwood.)
- *Schoolboy, Notes: Forest and Stream, Vol. 21, No. 3, p. 46, 1883. (Storm Lake.)
- *Wild, Doc, An Iowa Side Hunt: Forest and Stream, Vol. 21, No. 25, p. 498, 1883. (Rippey.)
- *Cooke, W. W., Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 118.
- Warren, B. H., Birds of Pennsylvania, p. 95, 1888.
- Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 127, 1888.
- *Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- Webster, E. B., The Hoosier Ornithologist and Oologist, Vol. 2, No. 4, p. 44, 1889.
- Ridgway, R., Ornithology of Illinois, p. 485, 1889.
- *Goss, R. D., "Old Abe" Jr: The Oologist, Vol. 6, No. 9, pp. 16-18, 1889. (New Sharon.)
- *Kelsey, Carl, Birds of Poweshiek County, Iowa. Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- Goss, N. S., History of the Birds of Kansas, p. 275, 1891.
- Thomson, A. V., Bald and Golden Eagles in Iowa: The Oologist, Vol. 8, No. 2, p. 31, 1891. (Decorah.)
- Hatch, Dr. P. L., Birds of Minnesota, p. 196, 1892.
- *Bendire, Capt. Chas., Life Histories of the North American Birds, Vol. 1, p. 280, 1892.

- *Osborn, Herbert, A partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Fisher, A. K., Hawks and Owls of the United States, p. 97, 1893.
- *Jones, Lynds, Bird Migration at Grinnell, Iowa: The Auk, Vol. 12, p. 236, 1895.
- *Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.
- *Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 7, 1897.
- *Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 18, April, 1897.
- *Savage, W. G., Some Notes on the Birds and Weather in Van Buren County, Iowa, March, 1897: The Iowa Ornithologist, Vol. 3, No. 2, pp. 26, 27, April, 1897.
- *Bartsch, Paul, Summer Birds of the Oneota Valley, (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 55, October, 1897. (Allamakee County.)
- Wilson, B. H., The Wilson Bulletin, p. 3, March, 1906.
- Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Anderson, R. M., The Birds of Iowa, p. 253, 1907.
- Woodruff, F. M., Birds of the Chicago Area, p. 98, 1907.
- Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, pp. 100-101, 1907.
- Cory, C. B., Birds of Illinois and Wisconsin, p. 474, 1909.
- Bruner, L., Wolcott, R. H., Swenk, M. H., Review of the Birds of Nebraska, p. 52, 1909.
- A. O. U. Check-List, p. 162, 1910.
- Chapman, F. M., The Birds of Eastern North America, p. 302, 1912.
- Bunker, C. D., The Birds of Kansas, p. 147, 1913.

Family **FALCONIDAE**. Falcons, Caracaras, Etc.

Subfamily **FALCONINAE**. Falcons.

Genus **Falco** Linnaeus.

18. *FALCO MEXICANUS* Schlegel. 355.

Prairie Falcon.

Field Characters.—A medium sized, swift flying hawk, not given to soaring; found on open dry prairies. Upper parts grayish brown; lower parts white with dark spots on the flanks.

Description.—Above, grayish brown, wing and tail feathers barred or spotted with buffy. Below, white with grayish brown or dusky

flank markings. Immature birds have the feathers of the back broadly margined with buff.

Measurements.—Length, 17 to 20 inches; wing, 11.60 to 14.30 inches; tail, 6.40 to 9 inches (Fisher).

Range.—From the Dakotas, Nebraska and Kansas to the Pacific, straggling eastward to Iowa and Illinois.

This bird of the western plains visits Iowa rarely. Like its near relative, the Duck Hawk, it is a wandering bird, more particularly, however, one of the prairie region; a "blue-blooded" falcon, powerful for its size and weight.

The only Iowa specimen the writer has seen is a male bird, number 3576, in the museum of the State University of Iowa, which was taken at Storm Lake, by Frank Bond. Professor C. C. Nutting has written of this bird in the Proceedings of the Iowa Academy of Science, 1892, p. 41. Dr. R. M. Anderson in "The Birds of Iowa" gives county records from Black Hawk, Buena Vista, Lee, Linn, Mills, Pottawattamie and Sioux counties.

Of its nesting habits, Dr. A. K. Fisher says, "The nest is placed usually on a shelf or in a niche on the perpendicular surface of a 'cut bank' so common in parts of the west, or among the crevices of rocky cliffs. It is probable that this Falcon also builds in hollow trees, as the Duck Hawk sometimes does. The eggs, which are usually three in number, though sets of four have occasionally been found, are deposited early in May, and by the latter part of July the young are able to leave the nest." Captain Bendire notes that sets of eggs commonly five in number are found in the western parts of the United States. According to Ridgway, the eggs are "creamy white, vinaceous white, or pale vinaceous buffy, sprinkled, speckled, or irregularly spotted with madder brown, 2.06 by 1.60 inches." There are no records of its having nested in Iowa.

Of eleven stomachs examined as recorded in The Hawks and Owls of the U. S., by Dr. A. K. Fisher, p. 106, 1893, "3 contained game birds; 5, other birds; 2, mammals; 2, insects; and 3 were empty."

Since individuals of this species reach Iowa rarely, their influence with us is negligible except as they help decimate the injurious faunal pests of western and southwestern regions which, if uncontrolled, might extend their range to our state.

Fig. 61.—Map showing the distribution in Iowa of the Prairie Falcon.

Falco mexicanus Schlegel.

*Cooke, W. W., Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, pp. 118-119. (Central Iowa.)

Ridgway, R., The Ornithology of Illinois, p. 429, 1889.

Goss, N. S., History of the Birds of Kansas, p. 280, 1891.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 288, 1892.

*Bond, Frank, in C. C. Nutting's Report of the Committee on State Fauna: Proceedings of the Iowa Academy of Science for 1892, Vol. 1, Part 3, p. 41, 1893. (Storm Lake.)

*Bond, Frank, Ibid., Reprint, p. 2. (Storm Lake.)

Fisher, A. K., Hawks and Owls of the United States, p. 104, 1893.

*Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, pp. 17, 18, April, 1897.

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Anderson, R. M., The Birds of Iowa, p. 254, 1907.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, pp. 101-102, 1907.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 52, 1909.

Cory, C. B., Birds of Illinois and Wisconsin, p. 477, 1909.

A. O. U. Check-List, p. 164, 1910.

Chapman, F. M., Birds of Eastern North America, p. 304, 1912.

Bunker, C. D., The Birds of Kansas, p. 147, 1913.

Fig. 62.—The Duck Hawk. (A live bird photographed by Mr. Alfred Bailey in Louisiana, 1916.)

Fig. 63.—The Duck Hawk (From Cory, Birds of Illinois and Wisconsin).

Subgenus *Rhynchodon* Nitzeh.

19. *FALCO PEREGRINUS ANATUM* Bonaparte. 356a.

Duck Hawk. Wandering Falcon. Great-footed Falcon.

Field Characters.—Of medium size, slate color above, light buff below with black markings, especially on the sides. Flight accomplished usually with continuous rapid wing strokes.

Description.—Above, blackish on the head; back, dusky bluish slate; indistinct bars on the white-tipped tail. Wings having flight-feathers barred with buffy. Below, light buff with dark bars and spots on sides.

Immature birds are dusky above, with buff-margined feathers; tail somewhat barred with gray. Sides of the head dark. Below, having heavier markings more generally distributed than in the adult.

Measurements.—Length, 16 to 19 inches; wing, 12 to 14 inches; tail, 6 to 9 inches.

Range.—Generally throughout North and South America; on our continent breeding locally in many states.

This "Noble Falcon" is a geographical variety of the Peregrine Falcon famous in heraldry. There is, perhaps, no swifter, more aggressive or courageous bird of prey. While not large, it is muscular, with powerful talons and beak. The keenness of eye exhibited, not only in distant vision, but in the rapidity of accommodation required as the bird dashes upon its quarry, gives an idea of the extraordinary functioning of every part of its vigorous body.

Though ranging over North America, the Duck Hawk is a bird nowhere common, and usually is seen only at intervals. Writers generally speak of its depredations in the dove-cote and poultry-yard, as well as among the wildfowl of our coastal and interior waters.

It has been reported to successfully attack mammals as large as the Jack Rabbit, and one observer records the killing of a Snowy Owl by one of these Falcons, after the Owl had raided the Falcon's nest and carried off one of its young.

Mr. George Burge, of Mount Vernon, together with Mr. Russell Moore and the writer, for several years watched the nesting of the Duck Hawks at the "Palisades" on Cedar river in the southeastern part of Linn and the northeastern part of Johnson counties. The limestone cliffs which border the Cedar at this place for some two or three miles form an ideal nesting and hunting location for these Falcons.

Duck Hawks were noted by Mr. Burge every year from 1892 to 1898. The birds arrived from the south during the first half of March, usually at the time of the early flight of wild-fowl. Their usual hunting time was in the early morning, and their call, a noisy Kak-Kak-Kak, rapidly repeated and shrill, was frequently heard.

In a former article the capture of a Teal Duck, as witnessed by my friend, is described as follows: "The Falcon started in pursuit, and the little Blue-winged Teal, realizing its danger, redoubled its speed and began to squawk its alarm in unmistakable notes of fear. The Falcon, flying parallel to and about a rod distant from its quarry, with rapid beats of its wings, speedily gained a point opposite, and then, with astonishing swiftness, struck the Teal almost at right angles. The blow was delivered with such precision and such stunning force that feathers flew in all directions." In their nests the feathers of a Kingfisher and also those of a Flicker have been found.

Messrs. James and Henry Ward of Britt have several times noted Duck Hawks during the hunting season in the vicinity of Eagle lake in Hancock county. They relate that on one occasion, while some hunters were concealed in the rushes, a flock of Teal Ducks numbering about a dozen flew swiftly toward their place of hiding. At the instant when the hunters delivered their volley, the ducks, catching sight of a pursuing Duck Hawk, dashed downward into and under the water, successfully avoiding the shot and eluding the Hawk. The hunters believing they had bagged the entire flock, were greatly chagrined a moment later to see the hawk flying away, not one duck having fallen either to their broadside or to the Falcon's claws.

The writer collected an immature female of this species May 12, 1911, near Eagle lake, Hancock county. This individual was flying over the rushes of the marsh at a height of about ten feet, evidently hunting Rails, and successfully, as the examination of her alimentary canal later proved. Mr. Ward reports that he has seen the Duck Hawk catch White-bellied Swallows.

Dr. Paul Bartsch pointed out to the writer while on a visit to Washington, D. C., a lofty building, where a Duck Hawk resorted, preying upon the tame pigeons which frequented the place in numbers. Protection was accorded it, notwithstanding the destruction wrought among the doves, as evidenced by numerous "leg-bands" which were found, because of the novelty of having one of the wildest and most solitary of Falcons in the very heart of the city.

The writer is inclined to believe that despite their infrequent occurrence in any one locality there are more of these Falcons annually within our borders than is commonly believed.

The Duck Hawk nests either in a natural crevice in a cliff, or in a cavity in some tall tree. The almost vertical limestone cliffs common along the rivers in many parts of eastern Iowa, as well as hollows in tall trees, afford suitable nesting sites. Often the only means of access, where the nest is placed on a cliff, is by means of a rope lowered from above. The eggs are laid directly upon the rocks or the bottom of the nesting cavity, there being no attempt at nest building.

From three to six eggs form a complete set, and are deposited usually during the first half of April. If the eggs of the first setting are taken, another clutch will be laid, the birds being strongly attached to a nesting site once it has been chosen. Second sets have usually a smaller number of eggs, and they are likely to be less heavily marked than those of the first clutch.

In color, the eggs vary from buff or dirty white and almost unmarked to those so heavily marked with reddish-brown as to nearly conceal the ground color. Mr. Burge has in all a series of seven beautiful sets, two of them of six eggs each, one of five, and four of four eggs each. An average egg measures about 2 by 1.55 inches.

Fig. 64.—Map showing distribution in Iowa of the Duck Hawk.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Female.....	Eagle Lake, Britt, Iowa.....	May 12, '11	Remains of Sora Rails	.....	.....	.....

Falco peregrinus anatum (Bonap.).

- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Parker, H. W., Iowa Birds: The American Naturalist, Vol. 5, p. 169, 1871. (Clinton County.)
- *Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur.)
- Knowlton, F. H., Bulletin Nuttall Ornithological Club, Vol. V, p. 57, 1880.
- Warren, B. H., Birds of Pennsylvania, p. 97, 1888.
- Ridgway, R., Ornithology of Illinois, p. 431, 1889.
- Bendire, Capt. Chas., Life Histories of North American Birds, p. 292, 1892.
- Hatch, Dr. P. L., Birds of Minnesota, p. 199, 1892.
- Fisher, A. K., Hawks and Owls of the United States, p. 106, 1893.
- *Burge, Geo. H., The Duck Hawk: The Iowa Ornithologist, Vol. 2, No. 1, pp. 14, 19, 1896.
- *Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 18, April, 1897.
- *Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 55, October, 1897. (Allamakee County.)
- Bailey, B. H., Proc. Ia. Acad. Sci., Vol. X, pp. 93, 98, 1903.
- Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Anderson, R. M., The Birds of Iowa, p. 255, 1907.
- Woodruff, F. M., Birds of the Chicago Area, p. 99, 1907.
- Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, p. 102, 1907.
- Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, pp. 52, 53, 1909.
- Cory, C. B., Birds of Illinois and Wisconsin, p. 478, 1909.
- Chapman, F. M., Birds of Eastern United States, p. 305, 1909.
- A. O. U. Check-List, p. 164, 1910.
- Bunker, C. D., The Birds of Kansas, p. 147, 1913.

Fig. 65.—The Pigeon Hawk.

Subgenus *Tinnunculus* Vieillott.

20. *FALCO COLUMBARIUS COLUMBARIUS* Linnaeus. 357.

Pigeon Hawk.

Field Characters.—A small slaty-bluish or brownish hawk, streaked below; tail with four or five grayish bands; wings pointed.

Description.—Above, slaty-bluish, except buffy on the neck; tail with four or five lighter bands and white tip. Flight feathers, white-barred. Below, buffy with black streaks, except on throat.

Immature birds: Above dusky brownish, flight feathers barred with buff.

Measurements.—Length, 10 to 13 inches; wing, 7 to 8.50 inches; tail, 5 to 5.50 inches.

Range.—North America; breeding chiefly north of the United States; only on rare occasions in Iowa.

The Pigeon Hawk is not a common species in Iowa at any season of the year. It is noted, however, during the spring and fall migrations, and has also been found nesting in the state.

R. M. Anderson in his "Birds of Iowa" speaks of having shot a Pigeon Hawk December 18, 1894, in Winnebago county, and records it as seen by Currier in winter in Lee county.

The habits of this small falcon are much like those of its larger relative, the Duck Hawk, in manner of flight, fearlessness in striking game birds even larger than itself, and also in nesting.

Eggs have been taken from open nests resembling those of the Crow, from cavities in hollow trees, and from ledges of rock.

Professor Lynds Jones found a nest of the Pigeon Hawk in a hole in a linden tree, near Grinnell, April 28, in which were four eggs. In the Coe College Museum there is a set of two eggs of this species collected by Mr. George H. Berry in Wild-cat Grove, seven miles north-east of Marion, April 27, 1908. They were taken from a hole in the side of a bass-wood tree twenty-five feet from the ground.

These eggs are quite evenly covered with cinnamon-brown spots on a buffy background, one egg appearing somewhat lighter and less rich in coloring than the other.

The average size of eggs of this falcon is 1.60 by 1.25 inches.

On one occasion in the early fall while watching at close range a flock of Least Sandpipers, my observation of the waders was cut short by their sudden departure. On looking about to determine what had startled them, I discovered a Pigeon Hawk close by on top of a muskrat house. His sudden arrival had escaped my eye, but not the alert eyes of the Sandpipers.

Writers generally agree on the large numbers of small birds captured by this little Falcon, tame doves, and formerly the Passenger Pigeon being included among the victims.

Of the fifty-six stomachs examined and reported upon by Dr. A. K. Fisher, 41 contained small birds, 16 contained insects, and only 2 contained poultry.

Fig. 66.—Map showing the distribution in Iowa of the Pigeon Hawk.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Male.....	Cedar Rapids.....	Sept. 18, '03.....	Seed-eating bird.....			
2		Keokuk.....	Aug. 21, '89.....	Small bird.....			Fisher

Falco columbarius Linn.

- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Trippe, T. M., Some Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Mahaska County.)
- *Eveland, F., In W. W. Cooke's Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 119. (Perry.)
- Warren, B. H., Birds of Pennsylvania, p. 99, 1888.
- *Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- Ridgway, R., Ornithology of Illinois, p. 435, 1889.
- *Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 128, 1889.
- *Kelsey, Carl, Birds of Poweshiek County, Iowa: The Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- Goss, N. S., History of the Birds of Kansas, p. 284, 1891.
- *Sheldon, Frank W., In Camp at Twin Lakes: Ornithologist and Oologist, Vol. 16, No. 10, p. 157, 1891.
- *Bendire, Capt. Chas., Life History of the North American Birds, Vol. 1, p. 299, 1892.
- *Jones, Lynds, Ibid., p. 299. (Grinnell.)
- *Preston, J. W., Ibid., p. 299. (Iowa City.)
- Hatch, Dr. P. L., Birds of Minnesota, p. 200, 1892.
- *Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- *Fisher, A. K., The Hawks and Owls of the United States: U. S. Department of Agriculture, Division of Ornithology and Mammalogy, Bull. 3, pp. 109, 113, 1893.
- *Rich, G. S., The Iowa Ornithologist, Vol. 1, No. 2, p. 49, January, 1895. (Sioux City.)
- *Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.
- *Mount, Tom, Birds in Central Iowa: Forest and Stream, Vol. 47, No. 12, p. 223, 1896. (Vinton.)
- *Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 7, 1897.
- *Keyes, Charles Reuben, The Iowa Raptors: The Iowa Ornithologist, Vol. 3, No. 2, pp. 17, 18, April, 1897.
- Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, p. 103, 1907.

Anderson, R. M., *Birds of Iowa*, p. 256, 1907.

Woodruff, F. M., *The Birds of the Chicago Area*, p. 99, 1907.

Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 53, 1909.

Cory, C. B., *Birds of Illinois and Wisconsin*, p. 479, 1909.

A. O. U. Check-List, p. 165, 1910.

Bunker, C. D., *The Birds of Kansas*, p. 147, 1913.

20A. *FALCO COLUMBARIUS RICHARDSONI* Ridgway. 357b.

Richardson's Pigeon Hawk.

Field Characters.—Not distinguishable at a distance from the Pigeon Hawk, of which it is a variety.

Description.—Slightly lighter in color than the preceding species; tail crossed by six light and five dark bars.

Measurements.—Same as in the Pigeon Hawk.

Range.—Eastern margin of the Plains Region and westward; straggling to Missouri, Iowa and Wisconsin.

This light variety of the Pigeon Hawk needs no lengthy treatment in this connection.

Dr. A. K. Fisher says, "It is with the greatest hesitation that the writer treats of it separately, especially as intermediate specimens are at hand."

R. M. Anderson says, "There are only a few casual records from Iowa."

Professor C. C. Nutting in the *Proceedings of the Iowa Academy of Science* for 1892, page 41, makes mention of a specimen from Storm Lake, Buena Vista county, collected by Mr. Frank Bond, and now in the University Museum.

The food in so far as determined is similar to that of the Pigeon Hawk, and there is no notable variation from that species in its nesting habits.

Falco columbarius richardsoni Ridgway.

*G. D., H. E., and Morton Peck in W. W. Cooke's report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 119, 1888. (La Porte City.)

Ridgway, R., *Ornithology of Illinois*, p. 434, 1889.

Goss, N. S., *History of the Birds of Kansas*, p. 286, 1891.

Hatch, Dr. P. L., *Birds of Minnesota*, p. 201, 1892.

Fig. 67.—Map showing the distribution in Iowa of Richardson's Pigeon Hawk.

Bendire, Capt. Chas., *Life Histories of North American Birds*, p. 303, 1892.

*Bond, Frank, in C. C. Nutting's *Report of the Committee on State Fauna: Proceedings of the Iowa Academy of Sciences for 1892*, Vol. 1, Part 3, p. 41, 1893. (Storm Lake.)

*Bond, Frank, *Ibid.*, Reprint, p. 2.

Fisher, A. K., *Hawks and Owls of the U. S.*, p. 114, 1893.

*Keyes, Charles Reuben, *The Iowan Raptores: The Iowa Ornithologist*, Vol. 3, No. 2, p. 20, April, 1897.

Bailey, B. H., *Two Hundred Wild Birds of Iowa*, p. 62, 1906.

Anderson, R. M., *The Birds of Iowa*, p. 287, 1907.

Widmann, Otto, *A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis*, p. 103, 1907.

Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 53, 1909.

Cory, C. B., *Birds of Illinois and Wisconsin*, p. 481, 1909.

A. O. U. Check-List, p. 165, 1910.

Bunker, C. D., *The Birds of Kansas*, p. 147, 1913.

Fig. 68.—The Sparrow Hawk.

Subgenus *Cerchnis* Boie.

21. *FALCO SPARVERIUS SPARVERIUS* Linnaeus. 360.

Sparrow Hawk. Mouse Hawk.

Field Characters.—The smallest and most highly colored of our Iowa hawks. Wings pointed; sides of head with *conspicuous black patches*; body and tail above showing much rusty red; spotted below with black.

Description.—Male, above slate-blue, usually with rusty red crown; back reddish with black bars. Tail, rusty red with one black bar near the white tip. Wings above slaty-blue; the flight feathers barred with white. Two vertical black marks on each side of head. Below slightly buffy with black spots on sides and belly. Female, with head much as in the male, the rest of the upper parts reddish with black bars. Below streaked with dusky buff.

Measurements.—Length, 9 to 12 inches; wing, 7 to 8 inches; tail, 4.50 to 5.50 inches.

Range.—East of the Rocky Mountains in North America, breeding commonly, but rarely wintering in Iowa.

This handsome little Falcon, least but most desirable of all our true Falconidæ, is a familiar and comparatively abundant species. Frequenting prairies where stand occasional Cotton-wood snags, or the

margins of groves in which suitable nesting crevices or woodpecker holes are available in which to nest, he is conspicuous in his livery of rusty red and slaty blue, the black cheek-bands suggesting strings to his bluish, rust-crowned hood. He even allows such close approach at times that the horn-blue of his bill and the yellow of the cere and feet may be seen.

The sharp cry has been well described as resembling "killy-killy-killy-killy" uttered in a rather high key, and once heard is easily recognized again.

They arrive in Iowa by the latter part of March or the first of April, and soon select a new nesting site or resort to one previously used. Although rarely found with us during the winter, Mr. G. H. Berry of Cedar Rapids brought the writer one that was killed in the month of January while pursuing English Sparrows.

The flight of the Sparrow Hawk is characterized by periods of hovering with wings in motion, somewhat like the Osprey, while awaiting the proper moment for a strike.

In some cases the nest is at no great altitude, and again a cavity forty or fifty feet above ground will be chosen. Mr. Frank C. Pellett of Atlantic has had them nesting in boxes which he put up for the purpose. They are known to nest in dove cotes and one pair was found nesting in the cornice of the old "Cooper Mill" on Cedar river at Cedar Rapids, while still another nested at the top of the steeple of the Congregational Church in Iowa City. Professor Lynds Jones reports finding them occupying old Crows' nests, which they used with very little change. In cavities there is little or no nesting material provided on which to deposit the eggs. Both birds are said to assist in incubation. That they are faithful is shown by the fact that the female will sometimes refuse to leave the eggs until forcibly removed. A set of three eggs of the Sparrow Hawk collected by Mr. G. H. Berry, April 20, 1892, from a Flicker hole in an elm near Ely, was obtained only after the female had been lifted from the nest.

Observers in the field and laboratory investigators who study the stomach contents of these hawks, agree as to the great usefulness of these birds to the farmer. Insect diet greatly predominates, and grasshoppers seem to be a staple article of food. Mice also are taken in numbers, as well as a few birds, among which sparrows (notably English Sparrows) are conspicuous.

In *not one* stomach of 320 reported by A. K. Fisher, was there found a trace of poultry

Ridgway, R., Ornithology of Illinois, 1889.

*Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.

*Sheldon, Frank W., In Camp at Twin Lakes: Ornithologist and Oologist, Vol. 16, No. 10, p. 157, 1891.

Goss, N. S., History of the Birds of Kansas, p. 287, 1891.

Hatch, Dr. P. L., Birds of Minnesota, p. 202, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 309, 1892.

*Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.

Fisher, A. K., Hawks and Owls of the U. S., p. 115. 1893.

*Jones, Lynds, Bird Migration at Grinnell, Iowa: The Auk, Vol. 12, pp. 121, 125, 1895.

*Jones, Lynds, Ibid., p. 236.

*Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.

*Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 7, 1897.

*Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 18, April, 1897.

*Savage, W. G., Some Notes on the Birds and Weather in Van Buren County, Iowa, March, 1897: The Iowa Ornithologist, Vol. 3, No. 2, p. 27, April, 1897.

*Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 55, October, 1897. (Winneeshiek and Allamakee Counties.)

Wilson, B. H., Wilson Bulletin, p. 3, March, 1906.

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. St. Louis, pp. 103-104, 1907.

Anderson, R. M., Birds of Iowa, p. 257, 1907.

Woodruff, F. M., Birds of the Chicago Area, p. 100, 1907.

Cory, C. B., Birds of Illinois and Wisconsin, p. 481, 1909.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 53, 1909.

A. O. U. Check-List, p. 166, 1910.

Chapman, F. M., Birds of Eastern North America, p. 306, 1912.

†Pellett, Frank C., Friends and Foes of the Fruit Grower: Sixth Annual Report Missouri State Board of Agriculture, pp. 113-127, 1912.

†Pellett, Frank C., Food Habits of the Red-tailed Hawk, Cooper Hawk, and Sparrow Hawk: Proc. Ia. Acad. Sci., XIX, pp. 199-201, 1912.

Bunker, C. D., The Birds of Kansas, p. 147, 1913.

†Sherman, Althea R., The Nest Life of the Sparrow Hawk: Auk, XXX, pp. 406-418, 1913.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Female	Iowa				Insects	
2	Female	Kenwood		Passerine bird			
3	Male	Muscatine Co.	July 21, '04		Mice	Grasshopper and katydid	
4	Male	Cedar Rapids	Sept. 4, '05		Field mouse	Insects (grasshoppers and crickets)	
5	Female	Cedar Rapids	Sept. 4, '05				
6	Male	Cedar Rapids	Mch. 9, '06	Sparrow	Mouse		
7	Female	Britt	April 4, '11				
8	Female	Iowa City	May 14, '15				
9	Male	Iowa City	Dec. 11, '14	Small bird	Mammal fur	Garter snake

Fig. 70.—The Osprey. (Photo by Frank W. Woodruff, Chicago Academy of Sciences.)

Fig. 71.—The Osprey, another view.

Family **PANDIONIDAE**. Ospreys.Genus **Pandion** Savigny.22. *PANDION HALIAETUS CAROLINENSIS* (Gmelin). 364.

Osprey. Fish Hawk. Fishing Eagle.

Field Characters.—A large Hawk, blackish above, and pure white below. Feet very large. Usually seen flying over water in search of fish which are captured with the talons.

Description.—Above dusky or brownish black, whitening on the head. Tail crossed by six or eight dusky bands. Below pure white with occasional brownish spots on the breast.

Immature birds, more spotted on the breast and darker on the back than adults.

Measurements.—Length, 21 to 24 inches; wing, 17 to 20 inches; tail, 7 to 10 inches.

Range.—In general, throughout North America; breeding in most of this territory.

The Osprey feeds exclusively on fish, which are usually if not always secured by plunging upon them from aloft in the air.

Fish Hawks may be seen flying leisurely above lake or river, pausing now and again on winnowing wings to scan the surface of the water for their prey. Fish which frequent the shallow water or swim near the surface are usually the victims, and in Iowa therefore the Carp constitutes no small part of the food of these birds.

It has been stated by observers that for the most part the fish secured by Ospreys are those considered least desirable by man.

Sometimes these birds are drowned through striking fish of such size that they are held beneath the surface, being unable to disengage their claws from the prospective prey.

R. M. Anderson says, "The American Osprey or Fish Hawk appears to be only a spring and fall migrant in Iowa, rather rare in general, but sometimes tolerably common along the larger water courses."

In former years the writer saw it frequently in the vicinity of Cedar Rapids, along Cedar river and especially about "Cedar lake," a marshy slough wherein Sunfish and Carp abound. Once while he was hunting in this vicinity, a bird of this species flew directly overhead at no great height carrying headforemost a Carp about a foot

Pandion haliaetus carolinensis (Gmel.).

*Say, Thomas, In Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, pp. 370, 377. (Engineers Cantonment, Pottawattamie County.)

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

*Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur County.)

*Mosher, A. A., The Fauna of Spirit Lake: Forest and Stream, Vol. 18, No. 4, p. 66, 1882.

*G. D., H. E., and Morton Peck, in W. W. Cooke's Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 120, 1888. (La Porte City.)

*Preston, J. W., Ibid., pp. 120-121. (Newton.)

Keyes, Chas. R., and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 128, 1888. (Des Moines.)

Warren, B. H., Birds of Pennsylvania, p. 103, 1888.

Ridgway, R., Ornithology of Illinois, p. 439, 1889.

*Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.

Goss, N. S., History of the Birds of Kansas, p. 290, 1891.

*Sheldon, Frank W., In Camp at Twin Lakes: Ornithologist and Oologist, Vol. 16, No. 10, p. 157, 1891.

*Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 320, 1892.

Hatch, Dr. P. L., Birds of Minnesota, p. 204, 1892.

Fisher, A. K., Hawks and Owls of the U. S., p. 130, 1893.

*Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.

*Audubon, M. R., and Coues, E., Audubon and his Journals, Vol. 1, p. 477, 1897. (Mills County.)

*Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 8, 1897.

*Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 18, 1897. (Mount Vernon.)

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Anderson, R. M., Birds of Iowa, p. 258, 1907.

Woodruff, F. M., Birds of the Chicago Area, p. 100, 1907.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, pp. 104-105, 1907.

Cory, C. B., Birds of Illinois and Wisconsin, p. 483, 1909.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 53, 1909.

A. O. U. Check-List, p. 168, 1910.

Chapman, F. M., Birds of Eastern North America, p. 307, 1912.

Bunker, C. D., The Birds of Kansas, p. 147, 1913.

†Gabrielson, Ira N., Some Marshalltown, Iowa, Notes: Auk, XXI, p. 256, 1914.

Fig. 73.—The Barn Owl.

Suborder **STRIGES.** Owls.

Family **ALUCONIDAE.** Barn Owls.

Genus **Aluco** Fleming.

23. *ALUCO PRATINCOLA* (Bonaparte). 365.

Barn Owl. Monkey-faced Owl.

Field Characters.—A light yellowish buff colored owl, with peculiar triangular or monkey-faced visage; during the daytime usually found concealed in old mills or barns.

Description.—Above, gray and buff with small black and white spots. Tail square with about four dark bars. Below, silky whitish or tawny, with few or many small black spots. Eyes dark.

Measurements.—Length, 16 to 19 inches; wing, 13 to 14 inches; tail, 5.50 to 7 inches.

Range.—North America in general; breeding from the Gulf northward to the northern tier of states in the United States.

This peculiar owl is counted rare in Iowa because of its strictly nocturnal habits. Odd in its color, and in the shape of its "facial disc," with its dark eyes, and peculiar cry, it stands unique among our birds of prey.

That it may be found in suitable localities anywhere in the state can scarcely be questioned since it has been recorded from Wisconsin and Minnesota, and taken at Osage, Mitchell county, at Dubuque, and at Sioux City. Mr. O. M. Greenwood sent the writer a male Barn Owl that had been taken near Manchester, June 20, 1912; and August 16, 1909, a female was secured near Cedar Rapids. While probably less common in the northern part of the state, it is not unlikely that careful observation would increase our records. The nocturnal habits, and the relatively large number of eggs laid, together with the abundant food supply, suggests that this species ought to increase in any locality where it breeds.

Professor Charles R. Keyes of Mount Vernon, some years ago found these birds nesting in an old stone mill near that place. They are also known to nest in hollow trees, in steeples, in barns and deserted buildings, and even in holes in the ground. It has been reported that the Barn Owl has been seen to occupy excavations in the more or less vertical loess banks in the vicinity of Sioux City; but up to the present, this fact, though entirely possible, has not been verified. No nesting material is used, the four to nine or ten oval white eggs being deposited on the accumulating litter of "owl pellets;" or, if in a tree, on the rotten wood at the bottom of the cavity. The eggs measure about 1.75 by 1.25 inches.

Observers are unanimous in placing this bird among those most beneficial, since mice and other small rodents form by far the major part of its bill of fare. It has been known to inhabit towers and other places frequented by pigeons, without molesting them.

Fig. 74.—Map showing the distribution in Iowa of the Barn Owl.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Female	Iowa City	Oct. 21, '13				Empty
2	Female	Osage	Nov. 13, '14		Mammal (hair)		Empty
3	Female	Iowa City	Dec. 2, '15				
4	Male	Iowa City	Dec. 12, '15		4 small rodents (mice)		

Aluco pratincola (Bonaparte).

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

*Lindley, J. W., Mississippi Valley Migration: Ornithologist and Oologist, Vol. 8, No. 5, p. 33, 1883. (Mitchell County.)

Warren, B. H., Birds of Pennsylvania, p. 104, 1888.

*Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Science, Vol. 5, p. 128, 1889.

Ridgway, Robert, Ornithology of Illinois, p. 400, 1889.

Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.

Goss, N. S., History of the Birds of Kansas, p. 292, 1891.

Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.

Hatch, Dr. P. L., Birds of Minnesota, p. 205, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 325, 1892.

*Williams, John, In C. C. Nutting's Report of the Committee on State Fauna: Proc. of the Ia. Acad. of Sci., for 1892, Vol. 1, Part 3, p. 41, 1893. (Iowa City.)

*Williams, John, Ibid., Reprint, p. 2. (Iowa City.)

Fisher, A. K., Hawks and Owls of the United States, p. 132, 1893.

*Bartsch, Paul, Note under Notes and News: Iowa Ornithologist, Vol. 2, No. 2, p. 49, 1896. (Burlington.)

*Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.

*Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, pp. 18, 19, April, 1897.

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Woodruff, F. M., Birds of the Chicago Area, p. 101, 1907.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, p. 258, 1907.

Anderson, R. M., The Birds of Iowa, p. 258, 1907.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 484, 1909.

Cory, C. B., Birds of Illinois and Wisconsin, p. 484, 1909.

A. O. U. Check-List, p. 168, 1910.

Chapman, F. M., Birds of Eastern North America, p. 308, 1912.

Bunker, C. D., The Birds of Kansas, p. 147, 1913.

Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus., p. 605, 1914.

Fenton, Carroll Lane, Preliminary List of the Birds of Floyd County, Iowa: Wilson Bulletin, XXVIII, pp. 130, 138, 1916.

Fig. 75.—The Long-eared Owl.

Family **STRIGIDAE**. Horned Owls, Etc.

Genus *Asio* Brisson.

24. *ASIO WILSONIANUS* (Lesson). 366.

Long-eared Owl.

Field Characters.—A medium sized, dark colored owl with very long ear tufts and yellow eyes. These owls are not often seen in the daytime even when they are fairly common.

Description.—Above, blackish brown and white, mottled; tail barred six to eight times with black. Feathers about the eyes buffy and black-tipped. Below, buffy and white, streaked on breast, and barred on sides and belly with brownish black. Eyes yellow. Ear-tufts very long.

Measurements.—Length, 14 to 16 inches; wing, 11 to 12 inches; tail, about 6 inches.

Range.—Temperate North America, breeding throughout most of its range.

This species is among the most nocturnal of our owls, and is found to keep rather strictly within the limits of the timber and brush-covered lands, or the protection of the pine trees planted about our farm yards. In these respects, it is quite in contrast to its near relative, the Short-eared Owl. It is easily distinguished by its long ear tufts and its medium size, being considerably larger than the Screech Owl, and very much smaller than the Great Horned Owl, both of which, like the Long Eared Owl, are possessed of ear tufts and yellow eyes. Its nocturnal habits cause it to be overlooked even in regions where it is fairly common. It is a very quiet bird, making little noise except the snapping of its bill when disturbed. It prefers trees with dense foliage, such as evergreens, or thickets of hawthorns. The nest is usually placed at no great distance from the ground, usually an old Crow's nest being used. The eggs are white, and measure about 1.60 by 1.30 inches. Mr. G. H. Berry secured a set of five eggs which were laid in an old Crow's nest in Wildcat Grove, seven miles north-east of Marion. Other nests have been reported from time to time. Dr. C. B. Cory states, "There is a set of five eggs in the Field Museum collection taken at Grinnell, Iowa, May 1, 1893."

Capt. Charles Bendire says, "Mr. J. W. Preston of Baxter, Iowa, writes me that one of their notes resembles "me-ow-ow-ow-ow" of a cat. Another is a subdued "hoo-hoo" or "oo-oo," often uttered for hours during the mating time. At a distance this sounds something like the lowing of a cow." He further states, "At the nest, when disturbed, the female ruffles her feathers, flies to the ground, curves her wings over her head, spreads her tails and feigns lameness, dragging herself along on the leaves, all the time snapping her mandibles, making a rapping noise as if two sticks were struck together. She will, at such times, also mew like a cat; if followed, she makes her way in a direction opposite to the nest. While this performance progresses the male is, perhaps, giving vent to his feelings by fluttering about and squealing like a half-grown rat in a trap, or muttering a mournful "hoo-maa-maa-voo" in a subdued tone. I have often mistaken the notes of this bird for those of human beings. On April 3, 1886, I took a fresh laid egg of the Long-eared Owl from a nest of Crow's eggs, and the parent of the latter did not seem to mind the intrusion."

Since the food of these birds consists almost entirely of small injurious rodents, the Long-eared Owl is to be counted among the most beneficial of our birds of prey.

Mr. Ira N. Gabrielson, at present connected with the United States Department of Agriculture, has kindly sent me the report on

the examination of some 225 pellets of the Long-eared Owl which were examined by Dr. Alexander Wetmore. The pellets were collected at Marshalltown, April 3, 1913, and give a very accurate and interesting idea of the menu of these valuable owls. The following is the list as reported: Song Sparrow, 4; Robin, 1; Little Shrew, 2; Short-tailed Shrew, 5; House Mouse, 3; Northern White-footed Mouse, 89; Meadow Mouse, 70; Prairie Meadow Mouse, 18. This shows a total of 187 small mammals, as against five birds, these mammals being some of the most annoying pests we have in the state.

Fig. 76.—Map showing the distribution in Iowa of the Long-eared Owl.

LIST OF STOMACH CONTENTS

No.	Sex	Locality	Date	Birds	Mammals	Miscellaneous	Notes
1	Male	Toledo	Jan. 3, '14		Small mammal (rodent)		
2	Male	Iowa City	Oct. 26, '13		Small rodent		
3	Male	Cedar Rapids	Nov. 7, '14		2 rodents		
4		Cedar Rapids	Nov. 8, '15		1 small rodent		
5		Keokuk	Nov. 28, '88		Mouse		
6	Male	Iowa	Nov. 10, '05		3 rodents		Fisher
7	Male	Iowa	Nov. 10, '05		1 rodent	Parasitic worms	
8	Male	Iowa	Nov. 10, '05		2 medium sized rodents		
9	Female	Oakville	Nov. 10, '05		2 rodents and 1 shrew		
10	Female	Oakville	Nov. 14, '05		1 mammal (hair)	Undetermined mass	
11	Male	Logan	Nov. 9, '05		3 medium sized rodents		
12	Male	Iowa	Nov. 9, '05		2 rodents		

Asio wilsonianus (Lesson).

- *Say, Thomas, In Major S. H. Long's Account of an Expedition from Pittsburg to the Rocky Mts., 1819-20, p. 370.
- *Williams, H. S., M. D., Season and Birds of the Prairie: Forest and Stream, Vol. 22, No. 21, p. 403, 1884. (Charles City.)
- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur and Mahaska Counties.)
- *Beal, F. E. L., Bird Migration in the Mississippi Valley from Observations Collected by W. W. Cooke: Forest and Stream, Vol. 19, No. 16, p. 306. (Ames.)
- Warren, B. H., Birds of Pennsylvania, p. 106, 1888.
- Ridgway, R., Ornithology of Illinois, p. 405, 1889.
- *Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- *Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Acad. of Nat. Sci., Vol. 5, p. 128, 1889. (Charles City.)
- E. S. P., The American Long Eared Owl: American Osprey, Vol. 1, No. 6, 1890. (Des Moines.)
- Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- Goss, N. S., History of the Birds of Kansas, p. 294, 1891.
- Hatch, Dr. P. L., Birds of Minnesota, p. 294, 1892.
- *Preston, J. W., in Bendire's Life Histories of North American Birds, Vol. 1, p. 328, 1892. (Baxter.)
- *Osborn, Herbert, A Partial Catalog of the Animals of Iowa Represented in the Collection of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Bendire, Capt. Chas., Life Histories of North American Birds, p. 328, 1893.
- Fisher, A. K., Hawks and Owls of the U. S., pp. 140, 144, 145, 1893.
- *Anderson, R. M., Owl Notes: The Nidologist, Vol. 2, No. 6, p. 79, Feb., 1895.
- *Orr, Ellison, The Finding of Owl Nests: The Oologist, Vol. 13, No. 3, p. 17, 1896. (Postville.)
- *Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.
- *Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 7, 1897.
- *Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 19, April, 1897.

- *Keyes, Charles Reuben, Notes and News: The Iowa Ornithologist, Vol. 3, No. 2, p. 24, April, 1897.
- *Hill, Thos. S., Where Are My Long Eared Owls?: Oologist, Vol. 14, No. 10, p. 96, 1897. (Knoxville.)
- Wilson, B. H., The Wilson Bulletin, p. 3, 1906.
- Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. of St. Louis, pp. 105, 106, 1907.
- Woodruff, F. M., Birds of the Chicago Area, p. 102, 1907.
- Anderson, R. M., The Birds of Iowa, p. 259, 1907.
- Cory, C. B., Birds of Illinois and Wisconsin, p. 486, 1909.
- Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 55, 1909.
- A. O. U. Check-Lists, p. 169, 1910.
- Chapman, F. M., Birds of Eastern North America, p. 310, 1912.
- Bunker, C. D., The Birds of Kansas, p. 147, 1913.
- †Tinker, A. D., Notes on the Ornithology of Clay and Palo Alto Counties, Iowa: Auk, XXXI, pp. 70, 81, 1914.
- Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus., p. 654, 1914.
- †Fenton, Carroll Lane, Preliminary List of the Birds of Floyd County, Iowa: Wilson Bulletin, XXVIII, pp. 120, 128, 1916.

Fig. 77.—The Short-eared Owl.

25. *ASIO FLAMMEUS* (Pontoppidan). 367.

Short-eared Owl. Marsh Owl. Prairie Owl.

Field Characters.—A medium sized, yellowish buff or tawny owl, with darker stripes; inhabiting the long grass of marshes and prairies and hunting by day as well as at dusk.

Description.—Above, having dusky, buff-edged feathers; tail with buff and dusky bands. Below, pale buff or whitish with dark brown streaks, heavier on the breast. Blackish immediately about the eyes. Eyes yellow. Ear-tufts scarcely noticeable.

Measurements.—Length, 14 to 16 inches; wing, 12 to 13 inches; tail, about 6 inches.

Range.—North America in general, breeding from Colorado, Missouri and Illinois, northward. Found both summer and winter in Iowa.

The Short-eared Owl or Marsh Owl, as it is sometimes called, is quite distinctly a bird of the open prairies and marshes, in which respect it is to be compared with the Marsh Hawk. It is one of the most diurnal of our owls; and especially in early dusk and on cloudy days, is found searching the long grass of fields and meadows for mice, shrews and other small mammals, as well as for insects, upon which it feeds.

It is frequently startled from its place of concealment by the hunter, and is usually shot down regardless of its economic value. Late in the fall it may be found in considerable numbers, and apparently at these seasons congregates where food is plentiful, and where the protecting slough grass affords sufficient cover.

The nest, which is placed on the ground, is composed of grasses and a few of the bird's own feathers. The eggs are white, measuring about 1.60 by 1.25 inches, and number from four to seven in a clutch. A nest of this species was found near Swan lake in Emmett county by Rev. A. G. Bailey. The nest was in a slight depression in the prairie, and was composed of grasses. R. M. Anderson mentions a set of six eggs which were collected by Mr. M. E. Halvorsen, May 16, 1896, near Forest City. "The nest was on the ground in a nearly dried marsh, placed between two big clumps of earth; composed of a few blades of grass and some feathers." A nest of the Short-eared Owl which contained five eggs was discovered by Mr. Charles Camel, May 15, 1889. The nest was on the ground in a marsh near Pappoose creek, southeast of Cedar Rapids. The bird was shot, and the set of eggs is now in the Coe College Museum, having been preserved by Mr. G. H. Berry.

The stomachs of a pair of Short-eared Owls from Story county, examined by Prof. F. E. L. Beal, contained mice only, though "they were shot in an artificial grove swarming with small birds." A. K. Fisher reports a specimen examined from Hancock county, July 15, 1889, which contained two meadow mice and two shrews; also two specimens from Keokuk, the first of which, November 8, 1885, contained a grackle, and the second, January 1, 1890, a mouse. One is often surprised, when handling the first bird of this species, to discover the remarkable extent of the external ear. The radiating feathers about the eyes in these, as in other owls, cover the auditory apparatus, and in this species conceal a skin-lined cavity extending about half way around each eye.

Fig. 78.—Map showing the distribution in Iowa of the Short-eared Owl.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Male	Marshalltown	Dec. 23, '92		Small rodent		
2	Male	Johnson Co.	Mch. 29, '14		2 small rodents		
3	Female	Iowa City	Dec. 5, '14		2 rodents		
4	Female	Cedar Rapids	Jan. 11, '06				Empty Wt. 13 oz.
5	Male	Boone	Jan. 3, '05		2 rodents (mice ?)		
6	Female	Iowa	Nov. 14, '05		Hair of Mammal	Mass of greenish material	
7	Female	Breda	Nov. 1, '05				Empty
8		Iowa	Jan. 26, '08				Empty
9	Male	Boone	Jan. 3, '05		1 mouse		
10		Hancock Co.	July 18, '89		2 meadow mice		
11					2 shrews		
12		Hancock Co.	July 18, '89		2 meadow mice		Fisher
13		Story Co.	Oct. —, '83		Mouse hair		Fisher
14		Story Co.	Jan. 1, '90		Mouse hair		Fisher
15		Keokuk	Nov. 8, '85	Grackle			Fisher
16	Female	Keokuk	Jan. 1, '90		Mouse		Fisher
17	Male	Cedar Rapids	Oct. —, '16		Traces of fur		
18	Male	Britt	Oct. —, '16		Traces of hair		
		Maynard	Dec. 28, '16		Mice		

Asio flammeus (Pontoppidan).

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

*Parker, H. W., Iowa Birds: The American Naturalist, Vol. 5, p. 169, 1871. (Poweshiek and Jasper Counties.)

*Beal, F. E. L., Bird Migration in the Mississippi Valley from Observations collated by W. W. Cooke: Forest and Stream, Vol. 19, No. 16, p. 306, 1882. (Ames.)

*Williams, Mrs. V. S., Mississippi Valley Migration: Ornithologist and Oologist, Vol. 8, No. 5, p. 33, 1883. (Coralville.)

*Lindley, J. W., Ibid., p. 33. (Mitchell.)

*Jones, Lynds, The Number of Eggs in a Set: Ornithologist and Oologist, Vol. 12, No. 10, p. 168, 1887. (Grinnell.)

Warren, B. H., Birds of Pennsylvania, 1888.

*Jones, Lynds, A List of Birds Found in Eastern Jasper and Western Poweshiek Counties, Iowa, The Curlew, Vol. 1, No. 6, p. 52, March, 1889.

Ridgway, R., Ornithology of Illinois, p. 407, 1889.

*Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Acad. of Nat. Sci., Vol. 5, p. 129, 1889.

*Crone, J. V., Summer Residents of Buena Vista County, Iowa: The Oologist, Vol. 7, No. 3, p. 46, 1890.

*Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.

Goss, N. S., History of the Birds of Kansas, p. 296, 1891.

Hatch, Dr. P. L., Birds of Minnesota, p. 208, 1892.

*Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 332, 1892.

Fisher, A. K., Hawks and Owls of the United States, pp. 145, 149, 1893.

*Anderson, R. M., Owl Notes: The Nidologist, Vol. 2, No. 6, p. 79, February, 1895.

*Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, p. 8, July, 1896.

*Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa: p. 8, 1897.

*Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 19, April, 1897.

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, pp. 106, 107, 1907.

Woodruff, F. M., Birds of the Chicago Area, p. 102, 1907.

Anderson, R. M., The Birds of Iowa, p. 260, 1907.

Cory, C. B., Birds of Illinois and Wisconsin, p. 488, 1909.

- Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 55, 1909.
 A. O. U. Check-List, p. 169, 1910.
 Chapman, F. M., Birds of Eastern North America, p. 310, 1912.
 Bunker, C. D., The Birds of Kansas, p. 148, 1913.
 Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus., p. 661, 1914.
 †Tinker, A. D., Notes on the Ornithology of Clay and Palo Alto Counties, Iowa: Auk. XXXI, pp. 70, 81, 1914.
 †Fenton, Carroll Lane, Preliminary List of the Birds of Floyd County, Iowa, Wilson Bulletin, XXVIII, pp. 120, 138, 1916.

Fig. 79.—The Barred Owl.

Genus *Strix* Linnaeus.

26. *STRIX VARIA VARIA* (Barton). 368.

Barred Owl. Hoot Owl.

Field Characters.—A large, grayish brown, dark eyed owl, without horns; with loud hooting notes. It frequents timber, especially along river bottoms; nesting in hollow trees.

Description.—Above, dark buffy brown and whitish, barred with brown across each feather. Below, with the same barring on the upper breast, but streaked on lower breast and belly. *Eyes dark colored. No ear-tufts.*

Measurements.—Length, 20 to 22 inches; wing, 13 to 14 inches; tail, 9 to 10 inches.

Range.—Eastern North America generally; breeding in the United States chiefly, from our northern border to Georgia, and west to Kansas and Colorado.

The Barred Owl is a common species throughout the state wherever groves of sufficient size, especially the wooded bottom lands of streams or the margins of lakes and sloughs, afford adequate cover. It seems particularly partial to timber near the water; and therefore is found in greatest abundance along the flood plains, and on the islands of the Mississippi, Missouri and the larger inland streams of the state.

While it hunts mostly at night, it is not averse to being abroad during the darker days.

Its call is similar in pitch to that of the Great Horned Owl, but is differently spaced, and may be represented by *who—who—who—who-aa*. Not infrequently at the close of the call there may be heard a chuckle or laugh. The cries of these birds when heard just outside the tent on a dark night are quite alarming to the timid.

The abundance of these birds is indicated by the fact that the writer has rarely been in a well timbered part of the state where their cries have not been heard in the twilight, dusk or early dawn.

While they are moving about on cloudy days, and sometimes when they are discovered in their places of concealment on bright days, they are unmercifully mobbed by bands of Crows and Blue Jays.

The nesting season is usually in March; and a hollow tree is commonly selected as a nesting site, though some observers have found them occupying open nests. They are strongly attached to their homes, once chosen; and a second setting of eggs will usually be laid in case the first is removed. On April 4, 1896, Mr. G. H. Berry secured a set of three eggs from a Barred Owl's nest which had yielded me a set about three weeks before.

The eggs are subspherical, white, and measure about 2.00 by 1.60 inches.

The food of these birds consists very largely of small mammals. Birds of several species, insects, fish and especially cray fish and

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1		Story Co.	Nov. 1883			Crayfish	Fisher
2	Male	Iowa City	Dec. 22, '13		Hair of a small mammal	Greenish mass (indeterminate)	
3	Male	Coneville	Nov. 28, '14			Undetermined mass	
4	Female	Homestead	Sept. 26, '13		Rodent	Grasshopper and beetle	
5	Male	Johnson Co.	Nov. 7, '15		Rodent		
6		Iowa	Jan. 3, '16		Hair of small mammal		
7	Female	Iowa City	Dec. 9, '15		Remains of three rodents		
8	Male	Johnson Co.	Dec. 10, '15		3 votes		
9	Female	Plato.	Oct. 25, '05	Small bird	Mass of hair	2 grasshoppers and unidentified mass	Wt. 2.6 lbs.
10	Male	Tipton	Oct. 31, '05			Fish bones and scales	
11	Female	Cedar Rapids	Nov. 22, '11			Large beetle and a straw	
12	Male	Linn Co.	Jan. 11, '04				
13		Shellsburg	Oct. 30, '05		Hair of mammal (opossum?)		
14	Female	Iowa	Jan. 16, '05		Mammal		
15	Female	North Liberty	Dec. 9, '11		Rabbit		
16	Female	Oakville	Nov. 26, '04		1 mouse		
17	Male	Iowa City	Oct. 26, '16		1 mole		
18	Female	Iowa City	Oct. 21, '16				
19	Male	Iowa City	Nov. 6, '16		Traces of hair	Sand	Empty
20	Male	Iowa City	Dec. 17, '16	Two feathers			
21	Female	Johnson Co.	Nov. 24, '16		Small rodents		
22	Female	Iowa City	Nov. 17, '16		Flying Squirrel		

Strix varia varia (Barton).

*Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 371. (Engineers Cantonment.)

*Maximilian, Prince Zu Wied. Reise in das Innere Nord Americas. In den Jahren 1832-34, Vol. 1, pp. 289, 339, Coblenz, 1839.

*Allen, J. A., Notes on the Birds observed in Western Iowa in the months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, p. 499, 1868.

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

*Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 233, 1872. (Decatur County.)

*Jones, Lynds, Bird Migration in the Mississippi Valley from Observations Collated by W. W. Cooke: Forest and Stream, Vol. 19, No. 16, p. 306, 1882. (Grinnell.)

*Williams, Mrs. V. S., Mississippi Valley Migration: Ornithologist and Oologist, Vol. 8, No. 5, p. 33, 1883. (Coralville.)

*J. M. W., Nesting of the Barred Owl: Ornithologist and Oologist, Vol. 13, No. 3, p. 38, 1888. (Black Hawk County.)

Warren, B. H., Birds of Pennsylvania, p. 109, 1888.

*Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.

Ridgway, R., Ornithology of Illinois, p. 409, 1889.

*Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 129, 1889.

*White, H. G., Geographical Variations of Eggs: Ornithologist and Oologist, Vol. 15, No. 1, p. 23, 1890.

*Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist. Vol. 16, p. 132, 1891.

Goss, N. S., History of the Birds of Kansas, p. 298, 1891.

Hatch, Dr. P. L., Birds of Minnesota, p. 210, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 335, 1892. (Grinnell.)

*Preston, J. W., Ibid., p. 336. (Baxter.)

*Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.

Fisher, A. K., Hawks and Owls of the United States, p. 150, 1893.

*Godley, A. P., Notes on the Birds of Iowa: The Iowa Ornithologist, Vol. 1, No. 3, p. 61, April, 1895. (Marshall County.)

*Bartsch, Paul, Ibid., p. 62. (Iowa City.)

- *Orr, Ellison, The Finding of Owls' Nests: The Oologist, Vol. 13, No. 3, pp. 17, 19, 1896. (Postville.)
- *Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 8, 1897.
- *Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 19, April, 1897.
- *Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 53, October, 1897. (Winneshieck and Allamakee Counties.)
- *Savage, David L., Birds of the Midland Region: The Midland Monthly, Vol. 7, p. 492, 1897. (Southern Iowa.)
- *Henning, C. F., Notes and News: The Iowa Ornithologist, Vol. 4, No. 2, p. 13, April, 1898. (Boone.)
- Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Wilson, B. H., The Wilson Bulletin, 1906, p. 4.
- Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, p. 107, 1907.
- Woodruff, F. M., Birds of the Chicago Area, p. 103, 1907.
- Anderson, R. M., Birds of Iowa, p. 261, 1907.
- Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 55, 1909.
- Cory, C. B., Birds of Illinois and Wisconsin, p. 489, 1909.
- A. O. U. Check-List, p. 170, 1910.
- Chapman, F. M., Birds of Eastern North America, p. 311, 1912.
- Bunker, C. D., The Birds of Kansas, p. 148, 1913.
- Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus., p. 641, 1914.
- †Fenton, Carroll Lane, Preliminary List of the Birds of Floyd County, Iowa: Wilson Bulletin, XXVIII, p. 138, 1916.

Fig. 81.—The Great Gray Owl.

Genus *Scotiaptex* Swainson.

27. *SCOTIAPTEX NEBULOSA NEBULOSA* (J. R. Forster), 370.

Great Gray Owl.

Field Characters.—The largest owl without ear-tufts in the state. Dark grayish in general color, with *yellow eyes*. Very rare.

Description.—Above, dusky, mottled with white; feathers about the eyes gray, with black concentric rings. Below, white and streaked on breast, and barred and streaked on sides with dusky. Feet and legs with long, hairlike feathers; eyes and bill yellow. Size very large. No ear-tufts.

Measurements.—Length, 26 to 28 inches; wing, 17 to 18 inches; tail, about 12 inches.

Range.—Boreal North America. Breeds from northern tree limit in central Alaska and northwestern Mackenzie, south to central Canadian provinces. Winters southward to northern United States, straggling to Iowa, Indiana and Ohio.

The Great Gray Owl is without doubt, in apparent size, if not by actual weight, the largest of our Iowa owls. It is a rare straggler from the north, and authentic records of its occurrence are very few. If the bird is in hand, it is not easily mistaken for the Barred Owl, which it most resembles. Its size, however, relatively small feet, and above all its yellow eyes, are in marked contrast to the smaller dimensions, comparatively larger feet, and dark eyes of the Barred Owl. The writer has purchased two specimens of this bird which were taken near Minneapolis, Minnesota, in the autumn of 1913, but has been unable to discover any specimens actually collected in Iowa.

R. M. Anderson notes that it is recorded by J. A. Allen (White's Geology of Iowa, Vol. 2, p. 424, 1870), and by I. S. Trostler on December 17, 1893, near Omaha (Rev. Bds. Neb., p. 55); also by T. M. Trippe near Oskaloosa in Mahaska county (Proc. Bost. Soc., XV., p. 233, 1872). He also records that Walter G. Savage reported one killed by his father in 1860 near Hillsboro, Van Buren county, and "David L. Savage writing in 1894 says 'a friend in Van Buren county shot a Great Gray Owl a few winters ago.'"

The species is looked upon as one that is not successful in the struggle for existence and that is decreasing in numbers.

Fig. 82.—Map showing the distribution in Iowa of the Great Gray Owl.

Scotiaptex nebulosa nebulosa (J. R. Forster).

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.

*Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 233, 1872. (Mahaska County.)

Warren, B. H., Birds of Pennsylvania, p. 238, 1888.

Ridgway, R., Ornithology of Illinois, p. 410, 1889.

Hatch, Dr. P. L., Birds of Minnesota, p. 211, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 345, 1892.

Fisher, A. K., Hawks and Owls of the U. S., p. 157, 1893.

Woodruff, F. M., Birds of the Chicago Area, p. 103, 1907.

Anderson, R. M., Birds of Iowa, p. 261, 1907.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, pp. 107, 108, 1907.

Cory, C. B., Birds of Illinois and Wisconsin, p. 490, 1909.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 55, 1909.

A. O. U. Check-List, p. 171, 1910.

Chapman, F. M., Birds of Eastern North America, p. 312, 1912.

Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus., p. 635, 1914.

Genus *Cryptoglaux* Richmond.28. *CRYPTOGLAUX ACADICA ACADICA* (Gmelin). 372.

Saw-whet Owl. Acadian Owl.

Fig. 83.—The Saw-whet Owl.

Field Characters.—The smallest of our owls. Brownish above with lighter under parts, yellow eyes, and no ear-tufts. Usually not shy, and not common.

Description.—Above, rich brownish with streaks of white on the head and white spots on the back. Tail with white bars. Below, whitish with reddish brown streaks. Feet buffy, feathered. Eyes yellow.

Immature birds lack the streaks and spots of the adult.

Measurements.—Length, 7.50 to 8.50 inches; wing, 5.25 to 5.75 inches; tail, about 3 inches.

Range.—North America in general; breeding from Nebraska, Indiana, Maryland and other middle states north to the middle Canadian region. In winter it is found south to the Gulf States.

The Saw-whet Owl is the smallest species found in Iowa; and both on account of its small size and inconspicuous coloration, it is the least observed of all our owls. The writer's first acquaintance with this diminutive owl was on a Thanksgiving morning many years ago when during a light fall of snow one of these birds was discovered perched in a willow thicket apparently taking advantage of the scant protection the twigs afforded. He was not at all shy and permitted a close approach. Since that time other specimens have been reported at irregular intervals. A female of this species was found dead beside the Rock Island tracks near Cedar Rapids, November 9, 1905, and a specimen of the same sex which was secured from Mr. C. J. Albrecht, was taken near Homestead, Amana Colonies, December 15, 1912. Mr. H. L. Stoddard of Chicago has informed the writer that he found the remains of a Saw-whet Owl in the stomach of a Barred Owl which was shot in the vicinity of Chicago. Mr. R. M. Anderson in *Birds of Iowa*, page 262, says, "More specimens have been taken in October and November than in any other months."

While there seem to be no definite nesting records for Iowa, this is probably due to oversight; since D. L. Savage reports its having been taken as late as the 6th of May in Henry county.

Dr. C. B. Cory says, "Nidification usually begins in April. The nest is placed in a hole in some tree or stump, occasionally a deserted woodpecker's nest being used." "The eggs are white, from three to five in number, and measure about 1.20 by 1 inch."

Mr. Anderson, who observed a caged bird for some eight months, describes its cry as a "querulous whistle which was repeated again and again." A. K. Fisher says, "The note of this species is peculiar and has a rasping character, resembling the sound made when a large-toothed saw is being filed; hence the name."

B. H. Warren lists the food of five Saw-whet Owls taken in Pennsylvania, showing that their menu consisted of grasshoppers, beetles, other insects, and one mouse.

Of 22 stomachs reported by A. K. Fisher, 17 contained mice; 1, a bird; 1, an insect; while 3 were empty.

That mice may be considered their chief food in Iowa is indicated by the data of four specimens which are included in the above summary by Dr. Fisher, and which were taken in Story county, as well as by the later findings and reports.

Fig. 84.—Map showing the distribution in Iowa of the Saw-whet Owl.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1		Story Co.	Dec., 1882		Mouse		A. K. Fisher
2		Story Co.	Dec., 1882		Mouse		A. K. Fisher
3		Story Co.	Jan. 8, '83		Mouse		A. K. Fisher
4		Story Co.	Oct., 1883		Mouse		A. K. Fisher
5	Female	Homestead	Dec. 14, '13		Small rodent (mouse?)		
6	Female	Cedar Rapids	Nov. 6, '05				Empty

Cryptoglaux acadica acadica (Gmelin).

*Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 371. (Engineers Cantonment.)

*Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870. (*N. albifrons* Cassin.)

Allen, J. A., Ibid., p. 424. (*N. acadica* Bonap.)

Warren, B. H., Birds of Pennsylvania, p. 112, 1888.

Ridgway, R., Ornithology of Illinois, p. 413, 1889.

*Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 129, 1889.

*Bryan, Willie A., Saw-whet or Acadian Owls: The Oologist, Vol. 7, No. 8, p. 177, 1890. (New Sharon.)

*Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.

Goss, N. S., History of the Birds of Kansas, p. 300, 1891.

*Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Iowa Agricultural College, p. 7, 1892.

Hatch, Dr. P. L., Birds of Minnesota, p. 213, 1892.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 350, 1892.

*Decker, E. G., In C. C. Nutting's Report of the Committee on State Fauna: Proceedings of the Iowa Academy of Sciences for 1892, Vol. 1, Part 3, p. 41, 1893. (Davenport.)

*Decker, E. G., Ibid., Reprint, p. 2. (Davenport.)

Fisher, A. K., Hawks and Owls of the U. S., p. 160, 1893.

*Anderson, R. M., The Saw-whet Owl in Captivity: The Iowa Ornithologist, Vol. 1, p. 26, October, 1894. (Forest City.)

*Bartsch, Paul, The Saw-whet Owl: The Iowa Ornithologist, Vol. 1, No. 2, p. 52, January, 1895. (Johnson County; Iowa City.)

*Law, J. Eugene, The Iowa Ornithologist, Vol. 1, No. 2, p. 52, January, 1895. (Perry.)

*Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 8, 1897.

Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 19, April, 1897.

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci. St. Louis, pp. 108, 109, 1907.

Woodruff, F. M., Birds of the Chicago Area, p. 105, 1907.

Anderson, R. M., Birds of Iowa, p. 262, 1907.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 55, 1909.

Cory, C. B., Birds of Illinois and Wisconsin, p. 493, 1909.

A. O. U. Check-List, p. 172, 1910.

Chapman, F. M., Birds of Eastern North America, p. 313, 1912.

Bunker, C. D., The Birds of Kansas, p. 148, 1913.

Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50,
U. S. Nat. Mus., p. 627, 1914.

Fig. 85.—Screech Owls.

Genus *Otus* Pennant.

29. *OTUS ASIO ASIO* (Linnaeus). 373.

Screech Owl. Little Hoot Owl. Red Owl. Gray Owl.

Field Characters.—The smallest of our Iowa owls with ear tufts. Either red or gray in plumage. Common about farmyards and even in towns. It utters a tremulous, gurgling cry.

Description.—Above, reddish or grayish with black streaks. Below, white with reddish barrings in the red phase, and streaked and barred with black and some rufous in the gray phase. Eyes yellow. Ear tufts about an inch long. Young birds are barred with grayish or reddish and white.

Measurements.—Length, 8 to 10 inches; wing, 6 to 7 inches; tail, 3 to 3.50 inches.

Range.—Eastern North America from Minnesota, Ontario and New Brunswick south to northeastern Texas and Georgia, and west to about the 100th meridian, accidental in England. (A. O. U. Checklist, 1910.)

Without doubt the little Screech Owl is the best known of its kind in Iowa. Its habit of frequenting not only the vicinity of country dwellings, but also of coming into the suburbs and even at times into the very centers of our larger cities, has enabled those unacquainted with other owls to become familiar with this species.

Its tremulous notes, heard most often at dusk and in the early morning, and the noisy mobbing of the Screech Owl by the Blue Jays, often attract the attention of the passerby. On such occasions careful search reveals the little red or gray owl with ear tufts standing erect and feathers close drawn to the body, altogether an inconspicuous object indeed. But when the sun has set and the shadows lengthen, the Screech Owls with their young fly fearlessly, and with feathers fluffed, sit on the branches unafraid. •

The two color phases of plumage, red and gray, found in this species cannot be accounted for by either the age of the bird, the sex, or the changing of feathers with the season of the year. Red birds mate with gray birds and their broods will be part red and part gray. In a family of six young taken May 21, 1915, the female parent being red and the male gray, there are five which show the red phase, while one is distinctly gray. Of twenty-five specimens of this owl in the Coe College Museum, collected chiefly in the eastern part of the state, fifteen are in the red phase and ten in the gray. My observation of birds noted, but not collected, leads me to believe that this represents approximately the relative proportion of the two color phases in this region. These hardy little birds are able to accommodate themselves to almost any cavity; preferring, however, the abandoned nests of the Flicker or Yellow-hammer. Old apple orchards and groves of maple, poplar and other soft woods are favorite resorts. The eggs are deposited usually during the first half of April, and are from four to six in number, white, and measure about 1.50 by 1.25 inches. Frequently the female will not leave the nest until actually lifted from the eggs; and in the daytime when discovered in the entrance of their homes, they usually retreat into the cavity, whereupon it is sometimes possible to capture both parents by reaching into the hole and drawing them out.

When the young are able to take short flights, the old birds not infrequently dash at the passerby who approaches too near the young; usually, however, contenting themselves with a clacking of the bill and a demonstration intended to frighten away the intruder. As pets these owls are docile and interesting.

The food consists very largely of mice; although sometimes small birds are taken, especially the English Sparrow and Blue Jay.

All observers unite in pronouncing the Screech Owl one of the most beneficial of our birds. They may be encouraged to nest near dwellings by providing suitable nesting cavities, which they are not loath to occupy.

Fig. 86.—Map showing the distribution in Iowa of the Screech Owl.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Male	State Center	Oct. 31, '08				Empty
2	Female	Atkins	Nov. 6, '08	Feathers and bones of seed-eating bird			
3	Male	Iowa			Rodent remains		
4		Blairtown	Nov. 30, '05		Rodent bones and hair		Wt. 4 oz.
5	Male	Central City	Jan. 4, '05				Empty
6	Female	Columbus Junction	Nov. 1, '05				Empty
7	Female	La Porte City	Nov. 6, '05				Empty
8		Keokuk	Dec. 14, '85		House mouse		Fisher
9	Female	Cedar Rapids	Jan. 12, '05	English sparrow	Mouse		

Otus asio (Linnaeus).

- *Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment, Pottawattamie County.)
- *Allen, J. A., Notes on the Birds Observed in Western Iowa in the months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, p. 499, 1868.
- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 242, 1872. (Decatur and Mahaska Counties.)
- *Beal, F. E. L., Bird Migration of the Mississippi Valley from Notes Collated by W. W. Cooke: Forest and Stream, Vol. 19, p. 306, No. 16, 1882. (Ames.)
- *Jones, Lynds, Ibid., p. 306. (Grinnell.)
- *Williams, Mrs. V. S., Mississippi Valley Migration: Ornithologist and Oologist, Vol. 8, No. 5, p. 33, 1883. (Coralville.)
- *Jones, Lynds, The Number of Eggs in a Set: Ornithologist and Oologist, Vol. 7, No. 10, p. 188, 1887. (Grinnell.)
- Warren, B. H., Birds of Pennsylvania, p. 114, 1888.
- *Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- Ridgway, R., Ornithology of Illinois, p. 415, 1889.
- *Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 130, 1889.
- *White, H. G., Geographical Variation of Eggs: Ornithologist and Oologist, Vol. 15, No. 1, pp. 2, 3, 1890.
- *Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- *Sheldon, Frank W., In Camp at Twin Lakes: Ornithologist and Oologist, Vol. 16, No. 10, pp. 155, 157, 1891.
- *Henning, C. F., An Afternoon Ramble: Ornithologist and Oologist, Vol. 16, No. 12, p. 180, 1891. (Gilbert Station, near Ames.)
- Goss, N. S., History of the Birds of Kansas, p. 302, 1891.
- *Jones, Lynds, in Bendire's Life Histories of North American Birds, Vol. 1, pp. 356, 357, 1892. (Grinnell.)
- *Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Hatch, Dr. P. L., Birds of Minnesota, p. 214, 1892.
- Fisher, A. K., Hawks and Owls of the U. S., p. 163, 1893.
- *Anderson, R. M., Owl Notes: The Nidologist, Vol. 2, No. 6, p. 79, February, 1895.

- *Shoemaker, F. H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.
- *Orr, Ellison. The Finding of Owls' Nests: The Oologist, Vol. 13, No. 3, p. 17, 1896. (Postville.)
- *Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 8, 1897.
- *Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 19, April, 1897.
- *Wilson, B. H., One Small Piece of Ground: The Iowa Ornithologist, Vol. 3, No. 4, p. 47, October, 1897.
- *Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, pp. 55, 56, October, 1897. (Winneshiek and Allamakee Counties.)
- *Savage, David L., Birds of the Midland Region: The Midland Monthly, Vol. 8, p. 462, 1897. (Southern Iowa.)
- *Savage, David L., Ibid., p. 528. (Southern Iowa.)
- Wilson, B. H., The Wilson Bulletin, p. 4, 1906.
- Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Woodruff, F. M., Birds of the Chicago Area, p. 105, 1907.
- Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, p. 109, 1907.
- Anderson, R. M., Birds of Iowa, pp. 262, 263, 1907.
- Cory, C. B., Birds of Illinois and Wisconsin, p. 494, 1909.
- Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 55, 1909.
- A. O. U. Check-List, p. 172, 1910.
- †Sherman, Althea B., Nest Life of the Screech Owl, Auk, XXVIII, pp. 155, 168, 1911.
- †Pellett, Frank C., Friends and Foes of the Fruit Grower: Sixth Annual Report of Missouri State Board of Agriculture, pp. 113, 127, 1912. (Illus.)
- Chapman, F. M., Birds of Eastern North America, p. 313, 1912.
- Bunker, C. D., The Birds of Kansas, p. 148, 1913.
- Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Museum, p. 690, 1914.
- Fenton, Carroll Lane, Birds of Floyd County, Iowa: The Wilson Bulletin, No. 96, p. 138, September, 1916.

Fig. 87.—The Great Horned Owl.

Trapping Hawks or Owls is more certain to get the real rascal that is devastating the roost than to shoot every Hawk or Owl that comes about the yard.

Genus *Bubo* Dumeril.

30. *BUBO VIRGINIANUS VIRGINIANUS* (Gmelin). 375.

Great Horned Owl. Hoot Owl. Cat Owl. Big Horned Owl.

Field Characters.—Largest of our owls with “horns” or “ear-tufts.” General color dark. Eyes large and yellow. Found usually in heavy timber. Nests either in an open nest like a hawk or in a hollow tree.

Description.—Above, mottled with whitish, ochraceous buff, and dusky. The spread tail shows many dark bars. Feathers about the eyes ochraceous buff, black tipped. Ear tufts mostly black. Below,

showing a conspicuous white throat patch ; the rest of the under parts barred with ochraceous buff and black. Feet buffy with some dusky barring. Eyes yellow. Sexes alike. Downy young, white.

Measurements.—Length, 21 to 24 inches ; wing, 15 to 16 inches ; tail, 8.25 to 9 inches.

Range.—In the United States from the British possessions to the Gulf, and westward as far as eastern Minnesota, Iowa, Missouri and Texas.

The Great Horned Owl, Big Hoot Owl, or Cat Owl, as it is variously called, is a common resident throughout Iowa. Its size, conspicuous ear tufts and large yellow eyes, serve as a sufficient means of identification. While the lighter colored varieties of this species are often difficult to distinguish, the points given above will serve most purposes.

It is found usually in well timbered regions and frequenting the older groves and bottom lands of our Iowa rivers, but occasionally may be found in more open districts, and the writer once followed and finally secured one that was flying from one willow hedge to another across the open fields in broad daylight.

Its keen eyesight, acute hearing and the power of its talons, combined with almost noiseless flight and the fact that it has the instincts of the marauder, makes this species one of the most destructive of all our birds of prey.

Its cry resembles whoo—who, who, who, who—who—who, having about the same pitch, but differing in the spacing of the call from that of the Barred Owl. In the breeding season the “hooting” may be heard in the timber where the birds are nesting, though sometimes it is so low that one can not hear the call from any great distance. The writer has brought them within gunshot by imitating their cry, while he was carefully concealed. Only once has the writer heard the scream as described by F. M. Chapman in his *Birds of Eastern North America*. He says, “A much rarer call is a loud, piercing scream, one of the most blood-curdling sounds I have ever heard in the woods.” While following a Great Horned Owl in Wildcat Grove, Linn county, on a somewhat foggy morning when the woods were damp and quiet, this startling scream was given by a bird a short distance away. It came so unexpectedly that for a moment the writer could hardly credit the Owl with such a volume of hair-raising sound.

These Owls are frequently mobbed by Crows and Jays who gather in large numbers, but usually keep at a respectful distance until the

Owl starts to fly, whereupon he is subjected to a series of overhead attacks until another perch has been reached.

The hardness of these birds is best shown by their early nesting habits. Usually in February and even in latter January the eggs are deposited either in an open nest or in the hollow cavity of a tree. Captain Bendire says, "Mr. Lynds Jones, of Grinnell, Iowa, informs me: 'I once had the good fortune to steal unnoticed upon a pair of these birds in their love making. The ceremony had evidently been in progress some time. When discovered the male was carefully approaching the female, which stood on a branch, and she half turned away like a timid girl. He then fondly stroked his mate with his bill, bowed solemnly, touched or rubbed her bill with his, bowed again, sidled into a new position from time to time, and continued his caresses. All these attentions were apparently bashfully received by the female. Soon thereafter the pair flew slowly away side by side.'"

The above description of the courting habits of the Great Horned Owl agrees with the observations of Professor Charles R. Keyes of Mount Vernon, who says, "suddenly the hooting of big owls boomed out from a near-by linden of the timber pasture, and there, sure enough, were both birds engaged in ardent courtship and not minding our presence in the least. They stood facing each other on the same branch and, with feathers ruffled and heads bobbing, were hooting in low tones as they side-stepped toward one another and greeted one another with low bows. Finally they flew away, side by side, into the timber tract." Mrs. Owl in the latter account seemed to be somewhat less shy and bashful.

The nesting habits of the Great Horned Owl have nowhere been more completely recorded than by Professor Keyes in the Smithsonian Report for 1911, pages 395 to 405. The nest here described was in a hollow elm tree only twenty-two feet from the ground. Mr. Keyes remarks that "at the very moment when this nest was discovered a second pair of these birds was domiciled in a Red-tail's nest placed in a tall white elm in heavy timber three and one-half miles to the northwest and just ninety-two feet above ground."

Mr. F. J. Lazell of Cedar Rapids has found them nesting in Bever Park, within the city limits, both in an open nest and in a cavity in a tree. It has also been reported that a pair nested in a cavity in the limestone cliffs at the Palisades in southeastern Linn county.

The eggs are from two to four, white, sub-spherical, somewhat granular on the surface, and measure about 2.25 by 1.75 inches.

In May and early June the young leave the nest and may then be found perched in the tops of the trees, from which they may be shaken down and captured. As captives they are interesting but not docile.

The amount and the variety of food found in and about the nests of Great Horned Owls well indicate their ability as hunters, and their omnivorous propensities.

On April 21, 1906, Professor Keyes found in a nest containing two young Horned Owls, half a Coot and half a mature Rabbit, together with four young Rabbits. On April 26, the same nest held the hinder parts of an adult Rabbit, a striped Gopher and a headless Bobwhite, also some Flicker feathers. On the 28th a Rabbit was found in the nest with the young birds, and at a later date a Rabbit and a Brown Rat were noted. On March 16, 1907, the nest contained besides the three young Owls, the remains of four adult Cotton-tail Rabbits, two Bobwhites and a Field Mouse. Domestic Pigeons and a King Rail were also listed as occurring among the food remnants.

In 1909 a farmer near Norway brought in a Great Horned Owl that had been captured in a steel trap set on a post near his chicken yard. Mr. C. D. Kirkpatrick discovered a nest of these birds April 12, 1911, about a mile and a quarter north of the Coe College Campus and within the city limits of Cedar Rapids. This contained, besides the two well feathered young about ready to leave the nest, the remains of a Flicker, a Striped Gopher, a good sized Carp, and the foot of a Cotton-tail Rabbit, while beneath the nest were found the headless remains of a Grebe, another Carp, the hindquarters of a Rabbit, and some feathers of a Robin as well as a mass of "owl pellets." The catching of such fish as the Carp is to be explained in this case, I believe, by the fact that the nest was located not far from a slough in the shallow waters of which Carp feed in numbers, often, as I have observed, with a considerable part of their backs exposed. These fish might easily be secured by an owl at such times without even wetting its feet,

Many writers speak of the noticeable odor of the Skunk about the nests and on the plumage of the Great Horned Owls. I believe that both the large Skunks and the spotted Skunks or Civets as they are commonly called, enter into the dietary list of these vigorous birds. One which was shot near Traer in 1902, had evidently not a great while before met with a most active member of the mephitic group.

Mr. R. M. Anderson mentions finding on May 2, 1896, the hind quarters of a large Rat and of a Pocket Gopher in a nest containing a young bird whose eyes were not yet open, and also notes a record by Mr. W. G. Savage of a nest near Hillsboro, Van Buren county, which contained thirty-eight field mice and one quail.

The variety of their diet, their exceptional ability in capturing their prey, and their cunning in eluding their foes, lead me to believe that they will long survive even in well settled parts of the state, though the very characteristics which make for their successful adaptation to their changing environment will not permit them to exist in any considerable numbers in a given area. It is doubtless well for the farmer that they should not be numerous, for poultry has been demonstrated to enter largely into their menu, and they have been known to kill far more at a time than they are capable of devouring at a meal.

Fig. 88.—Map showing the distribution in Iowa of the Great Horned Owl.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Female	Plato	Oct. 24, '05	Heart, legs and feathers of pigeon and chicken in its claws when shot	Mass of hair		Wt. 2.75 lbs.
2		Plato	Oct. 16, '05				
3	Male	Tipton	Jan. 4, '06		Hair, probably of rodent		Wt. 3.25 lbs. Fisher Fisher
4		Keokuk	Dec. 14, '88	3 small birds	Rabbit		
5		Sabula	Nov. 22, '91		Mammal (rabbit ?)		
6	Female	Iowa City	Dec. 5, '16				

Bubo virginianus virginianus (Gmelin).

- *Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 370. (Engineers Cantonment. Pottawattamie County.)
- *Allen, J. A., Notes on the Birds observed in Western Iowa in the months of July, August and September: Memoir of the Boston Society of Natural History, Vol. 1, p. 499, 1868.
- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, Vol. 2, App. B, p. 424, 1870.
- Parker, H. W., Iowa Birds: The American Naturalist, Vol. V, p. 170, 1871. (Poweshiek and Jasper Counties.)
- *Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 232, 1872. (Decatur and Mahaska Counties.)
- *Beal, F. E. L., Bird Migration in the Mississippi Valley, from Notes Collated by W. W. Cooke: Forest and Stream, Vol. 19, No. 16, p. 306, 1882. (Ames.)
- *Jones, Lynds, Ibid., p. 306. (Grinnell.)
- *Williams, Mrs. V. S., Mississippi Valley Migration: Ornithologist and Oologist, Vol. 8, No. 5, p. 33, 1883. (Coralville.)
- *Wild, Doc., An Iowa Bird Hunt: Forest and Stream, Vol. 21, No. 25, p. 498, 1883. (Rippey.)
- *Keyes, Charles Rollin, Great Horned Owl in Iowa: Ornithologist and Oologist, Vol. 9, No. 2, p. 17, 1884. (Des Moines.)
- *Joy, James C., Under Correspondence: The Oologist, Vol. 3, No. 2, p. 27, 1886. (Des Moines.)
- *Joy, James C., Great Horned Owl Eggs: The Hoosier Naturalist, Vol. 1, No. 7, p. 112, 1886. (Des Moines.)
- *Joy, James C., Under Oology: The Hoosier Naturalist, Vol. 1, No. 4, p. 59. (Des Moines.)
- *Keyes, Charles Rollin, Nesting of *Bubo Virginianus*: Ornithologist and Oologist, Vol. 13, No. 6, p. 93, 1888. (Des Moines.)
- Warren, B. H., Birds of Pennsylvania, p. 116, 1888.
- Ridgway, R., Ornithology of Illinois, p. 418, 1889.
- *Jones, Lynds, A List of Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, No. 6, Vol. 1, p. 52, March, 1889.
- *Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 130, 1889. (Des Moines.)
- *F. C., (Notes), Gleanings from our Correspondents: The Oologist, Vol. 6, No. 7, p. 185, 1889. (Grinnell.)
- *Balliett, Letson, In Our Monthly Mixture: The Oologist, Vol. 7, No. 6, p. 113, 1890. (Des Moines.)

- *Kelsey, Carl, The Effect of Winter upon the Arrival and Nesting of the Birds of Grinnell, Iowa: Ornithologist and Oologist, Vol. 16, No. 1, pp. 10, 11, 1891.
- *Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- Goss, N. S., History of the Birds of Kansas, p. 304, 1891.
- *Bendire, Capt. Chas., Life Histories of North American Birds, Vol. 1, pp. 376, 383, 1892.
- Hatch, Dr. P. L., Birds of Minnesota, p. 215, 1892.
- *Henning, C. F., My First Set of Great Horned Owl Eggs: Ornithologist and Oologist, Vol. 17, No. 5, p. 74, 1892. (Boone.)
- *Coues, E., History of Lewis and Clarke Expedition, Vol. 3, p. 1298, 1893.
- Fisher, A. K., Hawks and Owls of the U. S., p. 174, 1893.
- *Nutting, C. C., Report of the Committee on State Fauna: Proceedings of the Iowa Academy of Sciences for 1892, Vol. 1, Part 3, p. 41, 1893. (Iowa City.)
- *Nutting, C. C., Ibid., Reprint, p. 2. (Iowa City.)
- *Keyes, Charles Reuben, The Great Horned Owl in Iowa: The Oologist, Vol. 10, No. 3, p. 87, 1893. (Mount Vernon.)
- *Anderson, R. M., Owl Notes: The Nidologist, Vol. 2, No. 6, pp. 79, 80, February, 1895.
- *Irons, Ernest, Our Society Association: The Iowa Ornithologist, Vol. 1, No. 3, p. 53, April, 1895.
- *Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, p. 8, July, 1896.
- *Orr, Ellison, The Finding of Owls' Nests: The Oologist, Vol. 13, No. 3, pp. 17, 19, 1896. (Postville.)
- *Henning, C. F., The Red Tailed Hawk (*Buteo borealis*): Iowa Ornithologist, Vol. 2, No. 3, p. 67, 1896. (Boone.)
- *Henning, C. F., Under the Rambler Matured: The Iowa Ornithologist, Vol. 2, No. 3, p. 74, 1896.
- *Anderson, R. M., Under Notes and News: The Iowa Ornithologist, Vol. 2, No. 4, p. 86, 1896. (Winnebago County.)
- *Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 8, 1897.
- *Keyes, Charles Reuben, The Iowa Raptore: The Iowa Ornithologist, Vol. 3, No. 2, p. 20, April, 1897.
- *Anderson, R. M., Nesting Habits of Krider's Hawk: The Iowa Ornithologist, Vol. 3, No. 3, pp. 32, 33, July, 1897. (Hancock County.)
- *Wilson, B. H., One Small Piece of Ground: The Iowa Ornithologist, Vol. 3, No. 4, p. 48, October, 1897.
- *Bartsch, Paul, Summer Birds of the Oneota Valley (June, July, 1895): The Iowa Ornithologist, Vol. 3, No. 4, p. 55, October, 1897. (Winneshie and Allamakee Counties.)
- *Savage, W. G., Contents of an Owl's Nest: The Osprey, Vol. 1, No. 19, p. 136, 1897. (Hillsboro.)

- *Savage, David L., *Birds of the Midland Region: The Midland Monthly*, Vol. 7, p. 491, 1897. (Southern Iowa.)
- Wilson, B. H., *Wilson Bulletin*, 1906, p. 4.
- Bailey, B. H., *Two Hundred Wild Birds of Iowa*, p. 62, 1906.
- Widmann, Otto, *A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis*, pp. 110, 112, 1907.
- Anderson, R. M., *Birds of Iowa*, p. 263, 1907.
- Woodruff, F. M., *Birds of the Chicago Area*, p. 106, 1907.
- Cory, C. B., *Birds of Illinois and Wisconsin*, p. 495, 1909.
- Bruner, L., Wolcott, R. H., Swenk, M. H., *A Preliminary Review of the Birds of Nebraska*, p. 56, 1909.
- A. O. U. Check-List, p. 175, 1910.
- †Keyes, Charles Reuben, *A History of Certain Great Horned Owls: Condor*, XIII, pp. 5-19, 1911.
- Keyes, Charles Reuben, *Reprint in Smithsonian Report for 1911*, pp. 395-405.
- Chapman, F. M., *Birds of Eastern North America*, p. 315, 1912.
- †Sherman, Althea R., *Diurnal Activities of the Great Horned Owl: Auk*, XXIX, p. 240, 1912.
- Bunker, C. D., *The Birds of Kansas*, p. 148, 1913.
- Ridgway, R., *Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus.*, p. 739, 1914.
- Fenton, Carroll Lane, *The Wilson Bulletin*, No. 96, p. 138, September, 1916. (Floyd County.)

Fig. 89.—The Snowy Owl.

Genus *Nyctea* Stephens.

31. *NYCTEA NYCTEA* (Linnaeus). 376.

Snowy Owl. White Owl.

Field Characters.—Large, white, with yellow eyes and no ear-tufts. Seen usually after winter has well begun.

Description.—White above and below, barred more or less with dusky markings; female birds being more heavily marked as a rule. Feet and legs with long whitish hairlike feathers. Eyes yellow; ear-tufts not markedly evident.

Measurements.—Length, 22 to 26 inches; wing, 16 to 18 inches; tail, 9 to 10 inches.

Range.—Northern part of the Northern Hemisphere. In North America coming south in winter to Northern United States, and straggling south occasionally to the Bermuda Islands, North Carolina, Louisiana, Texas and California.

I am inclined to believe that the Snowy Owl visits Iowa every winter, but that some years find it here in far greater numbers than do others. The continuously cold winters, especially farther north, favor their southward movements, and though reported almost every year, they seem fewer when the winter is mild.

These beautiful owls vary greatly in the amount of dusky markings present on the otherwise immaculate feathers. Female birds are less white than males; and so far as has been observed, very light male birds are rarely taken in the state.

R. M. Anderson mentions a pure white specimen, now in the State University Museum, taken at Aurelia, January 18, 1885, and a nearly white one which he mounted February 18, 1895, secured at Buffalo Center.

In conversation with those who have seen Snowy Owls in Iowa, I learn that they not infrequently sit on the tops of hay or straw stacks in the open field during the day-time watching for their prey; and that in the timber they are difficult to discover, especially when the wet snow is clinging to the trunks and larger branches of the trees. The bright sunlight seems to be no serious hindrance to their hunting. Several writers speak of their celerity on the wing, striking down their quarry with swiftness and skill.

In the North the Hare and Ptarmigan comprise their chief food, Lemmings, Ducks and occasionally fish being also taken. In Iowa small mammals form the major part of the food, Rabbits and Mice predominating.

The breeding range in America is north of latitude 53°. The number of eggs in a set is said to vary from five to ten. They are deposited at intervals, so that when the last bird breaks the shell the oldest one is nearly ready to fly. (Fisher.) By this provision of nature the birds first hatched assist in maintaining an incubation temperature for the benefit of the later arrivals.

Fig. 90.—Map showing the distribution in Iowa of the Snowy Owl.

LIST OF STOMACH CONTENTS

No.	SEX	LOCALITY	DATE	BIRDS	MAMMALS	MISCELLANEOUS	NOTES
1	Male	Winterset	Nov. 15, '05				Empty
2	Female	Winterset	Nov. 10, '05				Empty
3	Male	Iowa	Nov. 13, '05		1 shrew and 1 rodent		
4	Male	Mechanicsville	Jan. 20, '13		Hair of medium sized mammal (rabbit?)		
5		Keokuk	Dec. 6, '86	Prairie Hen	Meadow mouse		Fisher
6		Sac Co.	Dec. 28, '82		Mouse		Fisher
7		Story Co.	Feb. 7, '82		Rabbit		Fisher

Nyctea nyctea (Linnaeus).

- *Allen, J. A., Catalogue of the Birds of Iowa: Geology of Iowa, White, Vol. 2, App. B, p. 424, 1870.
- *Trippe, T. M., Notes on the Birds of Southern Iowa: Proceedings of the Boston Society of Natural History, Vol. 15, p. 233, 1872. (Decatur County.)
- *Beal, F. E. L., Bird Migration in the Mississippi Valley from Observations Collated by W. W. Cooke: Forest and Stream, Vol. 19, No. 16, p. 306, 1882. (Ames.)
- *Mosher, A. A., The Fauna of Spirit Lake: Forest and Stream, Vol. 18, No. 4, p. 66, 1882.
- *Schoolboy, Note: Forest and Stream, Vol. 21, No. 3, p. 46, 1883. (Storm Lake.)
- *Hancock, E. M., Mississippi Valley Migration: Ornithologist and Oologist, Vol. 8, No. 5, p. 33, 1883. (Wantson.)
- *Lindley, J. W., Ibid., p. 33, (Mitchell.)
- *Williams, H. S., Seasons and Birds of the Prairie: Forest and Stream, Vol. 22, No. 21, p. 403, 1884. (Charles City.)
- *Lindley, J. W., In W. W. Cooke's Report on the Bird Migration in the Mississippi Valley, 1884-85: U. S. Department of Agriculture, Division of Economic Ornithology, Bull. 2, p. 123, 1888. (Mitchell.)
- Warren, B. H., Birds of Pennsylvania, p. 118, 1888.
- *Jones, Lynds, A List of the Birds found in Eastern Jasper and Western Poweshiek Counties, Iowa: The Curlew, Vol. 1, No. 6, p. 52, March, 1889.
- Ridgway, R., Ornithology of Illinois, p. 422, 1889.
- *Keyes, Charles Rollin, and Williams, H. S., M. D., Preliminary Annotated Catalogue of the Birds of Iowa: Proceedings of the Davenport Academy of Natural Sciences, Vol. 5, p. 130, 1889.
- *Breeze, Fred J., Brief Notes: Ornithologist and Oologist, Vol. 15, No. 4, p. 62, 1890. (Iowa.)
- *Kelsey, Carl, Birds of Poweshiek County, Iowa: Ornithologist and Oologist, Vol. 16, p. 132, 1891.
- Goss, N. S., History of the Birds of Kansas, p. 307, 1891.
- *Osborn, Herbert, A Partial Catalogue of the Animals of Iowa Represented in the Collections of the Departments of Zoology and Entomology of the Iowa Agricultural College, p. 7, 1892.
- Hatch, Dr. P. L., Birds of Minnesota, p. 217, 1892.
- Bendire, Capt. Chas., Life Histories of North American Birds, p. 389, 1892.
- Fisher, A. K., Hawks and Owls of the U. S., p. 182, 1893.
- *Crone, J. V., Under Notes and News: The Iowa Ornithologist, Vol. 2, No. 2, p. 50, 1896. (Marathon.)
- *Shoemaker, Frank H., A Partial List of the Birds of Franklin County, Iowa, July, 1896, p. 8.

- *Anderson, R. M., Birds of Winnebago and Hancock Counties, Iowa, p. 9, 1897. (Buffalo Center.)
- *Keyes, Charles Reuben, The Iowan Raptores: The Iowa Ornithologist, Vol. 3, No. 2, p. 20, April, 1897.
- Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.
- Woodruff, F. M., Birds of the Chicago Area, p. 106, 1907.
- Anderson, R. M., Birds of Iowa, p. 266, 1907.
- Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, pp. 112, 113, 1907.
- Cory, C. B., Birds of Illinois and Wisconsin, p. 497, 1909.
- Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 56, 1909.
- A. O. U. Check-List, p. 176, 1910.
- Bunker, C. D., The Birds of Kansas, p. 148, 1913.
- Chapman, F. M., Birds of Eastern North America, p. 315, 1912.
- †Tinker, A. D., Notes on the Ornithology of Clay and Palo Alto Counties, Iowa: Auk, XXXI, pp. 70-81, 1914.
- Ridgway, R., Birds of North and Middle America, Part VI, Bull. 50, U. S. Nat. Mus., p. 768, 1914.
- Fenton, Carroll Lane, Preliminary List of the Birds of Floyd County, Iowa: Wilson Bulletin, XXVIII, pp. 130, 138, 1916.

Genus *Surnia* Dumeril.

32. *SURNIA ULULA CAPAROCH* (Muller). 377a.

Hawk Owl.

Field Characters.—A medium sized, hawklike, grayish brown owl, with long rounded tail; to be seen hunting in the day-time.

Description.—Above, grayish brown; head and neck spotted, and back barred with white; tail long, rounded, and indistinctly white-barred, the central feathers considerably longer than the lateral ones. Below, with dusky streaks on sides of neck and upper breast; throat with dusky spot, the remainder of the under parts barred with reddish brown. Feet and toes completely feathered.

Measurements.—Length, 14.75 to 17 inches; wing, 8 to 9 inches; tail, 7 to 7.25 inches.

Range.—Northern North America, breeding generally north of the United States. South in winter to Nebraska, Iowa, Indiana, Ohio, etc.

This diurnal owl is of very rare occurrence in Iowa. R. M. Anderson says, "George H. Berry reports the Hawk Owl as a rare winter visitant in Linn county. He states that he has taken one specimen in Iowa, and also observed one in December, 1903, near Cedar Rapids, which he did not secure." It is spoken of as an owl with the feeding habits of a hawk and fully as capable of hunting by day.

A peculiarity of its flight is its dropping from the perch to near the level of the ground or bushes, and on approaching another perch, ascending almost perpendicularly to it.

It is spoken of as an unsuspicious bird, not at all shy, and ready to defend its nest. The nesting site is usually a cavity in a tree, in which no lining is placed. The eggs are three to seven in number and measure about 1.50 by 1.23 inches.

Dr. Elliot Coues in his "Birds of the Northwest" says, "It feeds chiefly upon field mice (*Arvicolae*) which swarm in the sphagnum vegetation of arctic lands; also upon small birds, grasshoppers and other insects."

Fig. 91.—Map showing the distribution in Iowa of the Hawk Owl.

Surnia ulula caparoch (Muller).

Say, Thomas, in Major S. H. Long's Account of an Expedition from Pittsburgh to the Rocky Mts., 1819-20, p. 371. (Engineers Cantonment.)

Coues, E., Birds of the Northwest, p. 312, 1874.

Hatch, Dr. P. L., Birds of Minnesota, p. 219, 1892.

Fisher, A. K., Hawks and Owls of the U. S., p. 187, 1893.

Widmann, Otto, A Preliminary Catalogue of the Birds of Missouri: Trans. Acad. Sci., St. Louis, p. 113, 1907.

Anderson, R. M., Birds of Iowa, p. 267, 1907.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 56, 1909.

A. O. U. Check-List, p. 177, 1910.

Chapman, F. M., Birds of Eastern North America, p. 316, 1912.

Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus., p. 774, 1914.

Fig. 92.—The Burrowing Owl.

Genus *Speotyto* Golger.

33. *SPEOTYTO CUNICULARIA HYPOGÆA* (Bonaparte). 378.

Burrowing Owl. Ground Owl.

Field Characters.—A small, rather long-legged owl brownish in color, with yellow eyes. Seen on the prairie, usually near a burrow or hole in the ground into which it retreats, and where its nest is made.

Description.—Above, brown with whitish and buff spots, and with buff barring on the flight feathers of the wings. Tail with about

four light buff bars. Below, light buff marked with brown barrings. Under tail coverts unmarked.

Measurements.—Length, 9 to 11 inches; wing, 6 to 7 inches; tail, about 3.50 inches.

Range.—Western United States from the Pacific coast to Minnesota and Louisiana, and from British Columbia and Manitoba south to Panama; migratory north of Oregon and northern Kansas; accidental in New York and Massachusetts. (A. O. U. Checklist, 1910.)

Though the Burrowing Owl has been found as an accidental straggler in New York and Massachusetts, western Iowa may be considered the margin of its legitimate range eastward in this latitude. A bird of the prairie, living in holes excavated frequently by Badgers, Prairie Dogs, Gophers, Foxes and Coyotes, it finds its prey in the open and its cover in the ground.

Those who have intimately studied its habits speak of its bowing and turning in ludicrous fashion. An interesting description of this is given in Goss' "History of the Birds of Kansas" as follows: "Their figure is peculiar; with their long legs and short tail the element of the grotesque is never wanting. It is hard to say whether they look most ludicrous as they stand stiffly erect and motionless, or when they suddenly turn tail to duck into the hole, or when engaged in their various antics. Bolt upright, on what may be imagined their rostrum, they gaze about with a bland and self-satisfied but earnest air, as if about to address an audience upon a subject of great pith and moment. They suddenly bow low, with profound gravity, and, rising abruptly, they begin to twitch their faces and roll their eyes about in the most mysterious manner, gesticulating wildly, every now and then bending forward till the breast almost touches the ground, to propound the argument with most telling effect; then they face about to address the rear, that all may alike feel the force of their argument; they draw themselves up to the fullest height, outwardly calm and self contained, pausing in the discourse to note its effect upon the audience and collect their wits for the next rhetorical flourish. And no distant likeness between these frothy orators and others is found in the celerity with which they subside and seek their holes on the slightest intimation of danger."

R. M. Anderson in his "Birds of Iowa" gives records for the following counties: 1895, Dickinson (Salisbury); 1904, Kossuth (Bingaman); 1896, Lyon (Professor B. Shimek); 1902, Sioux (Johnson); 1890, Linn (Berry); 1898, Woodbury (Bond, Rich, Trostler). On September 9, 1916, Mr. J. A. Spurrell of Wall Lake,

Sac county, told the writer that he had observed several Burrowing Owls at various times in that county, most of them being seen southwest of Wall Lake. One colony north of Lake View is on a gravel knoll, the birds of this colony being found April 14, 1916, apparently digging a burrow, the hole being just large enough for the birds and not as large as a badger hole. The new earth looking as though it had been scratched out. Near this burrow Mr. Spurrell found a small Leopard Frog. Pellets found near burrows at various times contained "mostly wing coverts of various species of beetles, and in one the skull and fur of a meadow mouse was found."

Mr. Spurrell has observed that the young come to the mouth of the burrow about the middle of July. The birds seem to be quite locally distributed, but fairly common in these localities.

Mr. A. F. Allen, editor of the Sioux City Journal, reports observations made by seven members of the Sioux City Bird Club on September 20, 1914, who visited a colony of three pairs of Burrowing Owls about eight miles southeast of Sioux City, where these birds had reared their young that summer in holes dug probably by "coyotes or other mammals" and on the "side of a hill—the northwest exposure." Mr. Allen says, "The owls migrate for the winter, and will leave, according to their habit, about the first week in October."

Those who have examined the nests of these birds agree that they are very filthy, there usually being a litter of partly eaten and partly decayed food about the burrow, and the nest itself is almost invariably infested with fleas. As nesting material upon which the five to eight, and occasionally ten or eleven eggs are deposited, dried horse or cow dung is used, with a few grass stems, and occasionally other substances.

The eggs measure about 1.22 by 1.04 inches; they are pure white, and subspherical in shape.

Fig. 93.—Map showing the distribution in Iowa of the Burrowing Owl.

Speotyto cunicularia hypogaea (Bonaparte).

Goss, N. S., History of the Birds of Kansas, p. 310, 1891.

Bendire, Capt. Chas., Life Histories of North American Birds, p. 395, 1892.

Fisher, A. K., Hawks and Owls of the U. S., p. 189, 1893.

Bailey, B. H., Two Hundred Wild Birds of Iowa, p. 62, 1906.

Anderson, R. M., The Birds of Iowa, p. 268, 1907.

Bruner, L., Wolcott, R. H., Swenk, M. H., A Preliminary Review of the Birds of Nebraska, p. 56, 1909.

A. O. U. Check-List, p. 177, 1910.

Bunker, C. D., The Birds of Kansas, p. 148, 1913.

Ridgway, R., Birds of North and Middle America, Part VI, Bulletin 50, U. S. Nat. Mus., p. 814, 1914.

†Allen, A. F., Burrowing Owl Breeding in Iowa: Wilson Bulletin, XXVI, p. 213, 1914.

†Swenk, M. H., The Birds and Mammals of Nebraska, p. 882, 1915.

INDEX.

*The letters "bib" following a person's name in the index indicate that the reference is to the bibliographies which follow the descriptions of the species of birds. The page number following the letters shows the first bibliography in which the name is cited.

A

- Acadian owl, 203.
Accipiter, 69.
 cooperi, 74.
 velox, 69, 71
 Albrecht, C. J., 204
 Allen, A. F., 233.
 Allen, J. A., bib.* 49, 52
Aluco, 178.
 pratincola, 178
Aluconidae, 178.
 American vultures, 46.
 Anderson, R. M., 47, *bib. 50, 57, 63, 83,
 91, 116, 119, 132, 153, 163, 167,
 190, 204, 218, 224, 232.
Aquila, 142.
 chrysaetos, 142.
Archibuteo, 133.
 ferrugineus, 139.
 lagopus sancti-johannis, 133.
Asto, 183.
 flammeus, 189.
 Wilsonianus, 183.
Astur, 83
 atricapillus striatulus, 88.
Asturina, 132.
 plagiata, 132.
 Audubon, M. R., bib. 50.
 Aurella, snowy owl from, 224.

B

- Bailey, A. G., 190
 Bailey, Bert Heald, bib. 50
 biography, 15
 publications of, 17
 work of, on birds, 11
 Bailey, Mrs. B. H., 30
 Baird, S. F., 58
 Bald eagle, 38, 41, 147
 Bartsch, Paul, bib. 50, 158
 bibliography of, 27, 49
 Bailliet, Letson, bib. 72
 Barn owl, 38, 44, 178
 Barred owl, 38, 43, 194
 Barrows, W. B., bib. 107
 Batty, Jos. H., bib. 104
 Beal, F. E. L., bib. 49, 190
 Beebe, Mary B., and C. W., bib. 56
 Bendire, Charles, 47, bib. 49, 120, 126,
 140, 153, 184
 Berry, G. H., 34, 47, 83, 149, 163, 170,
 184, 190, 195
 Berry, H. N., bib. 49
 Bibliographies, arrangement of, 12
 Big blue chicken hawk, 83
 Big blue hen hawk, 83
 Big Cedar creek, Mexican goshawk
 from, 133
 Big chicken hawk, 93, 119
 Big horned owl, 38, 214
 Bigelow, N. K., 33
 Bill, length of, 40

- Binge, George, 34
 Bird, how to measure, 40
 length of, 40
 stretch of, 40
 Birds of prey, key to, 40
 Black hawk, 133
 Black Hawk county, turkey buzzard
 from 47
 Black red-tail, 112
 Blue hawk, 59
 Blue hen hawk, 74
 Bond, Frank, 153, 167
 Bond, H. L., bib. 49
 Boone, marsh hawk from, 63
 Brewer, T. M., bib. 85
Brewsteria, 139
 Brezee, Fred J., bib. 227
 Britt, marsh hawk from, 61
 Broad-winged hawk, 38, 42, 125
 flight of, 125
 habits of, 126
 new variety in Iowa, 12
 Brown, H. J., bib. 145
 Brown, Jasper, 116, bib. 122
 Bruner, L., bib. 50
 Bryan, Willie A., bib. 207
Bubo, 214
 virginianus virginianus, 214
 Buena Vista county, pigeon-hawk from,
 167
 Buettner, Charles, 34, 57
 Buffalo Center, snowy owl from, 224
 Bunker, C. D., bib. 50
 Burge, George, 47, 157
 Burlington, Mississippi kite from, 57
 Burns, F. L., 95, bib. 107, 126
 Burr Oak, golden eagle from, 143
 Burrowing owl, 38, 44, 231
 habits of, 232
Buteo, 93
 borealis borealis, 93
 borealis calurus, 110
 borealis harlani, 112
 borealis krideri, 108
 lineatus lineatus, 115
 platypterus, 125
 platypterus townsendi, 130
 swainsoni, 119
Butconidae, 51.
 Buzzard, 46, 51
 turkey, 46

C

- California squirrel hawk, 139
 Camel, Charles, 190
Caracaras, 152
Cathartes, 46
 aura septentrionalis, 46
Cathartidae, 46
 Cat owl, 214
 Cedar Rapids, bald eagle at, 140
 barn owl near, 179
 broad-winged hawks at, 125

Cedar^{*} Rapids—Continued.

- goshawk near, 83
- great horned owl from, 216
- osprey near, 176
- saw-whet owl from, 204
- short-eared owl from, 190
- sparrow-hawk from, 170
- swallow-tailed kites from, 52
- western goshawk near, 88

Cedar river, red-shouldered hawk on, 116

Cerohneis, 169

Chapman, F. M., bib. 50, 215

Chicago, saw-whet owl from, 204

Chicken hawk, 74, 115

big, 93

Clear Lake, red tail from, 98

sharp-shinned hawks from, 69

Circus, 59

hudsonius, 59

Clute, W. M., bib. 49

Cobden, John, 34, 52

Coe College Museum, 15

Cooke, W. W., bib. 49

Cooper's hawk, 38, 42, 74

damage by, 77

Cory, C. B., 30, bib. 50, 88, 184, 204

Coues, Elliott, bib., 50

Crone, John V., bib. 65

Cryptoglaux, 203

acadica acadica, 203

Currier, pigeon hawk from, 163

D

Decker, E. G., bib. 207

Dill, Homer R., 33, 84

Dows, William G., 33

Duck hawk, 38, 42, 157

habits of, 159

E

Eagle, bald, 38, 41, 147

fishing, 175

golden, 38, 41, 142

white-headed, 147

Eagle Lake, duck hawk from, 158

marsh hawk from, 61

red-tail from, 97

Eastes, 51

key to, 41

Eastern red-tailed hawk, 93, 98

Elanoides, 51

forficatus, 51

Emmet county, short-eared owl from, 190

Evans, A. H., bib. 107

Eveland, F., bib. 166

Fairfax, turkey buzzard from, 47

Falco, 152

Columbarius columbarius, 162

columbarius Richardsoni, 167

mexicanus, 152

peregrinus anatum, 157

sparverius sparverius, 169

Falcon, great-footed, 157

prairie, 152

wandering, 157

Falcones, 51

Falconidae, 152

Falconinae, 152

Falcons, 51, 152

key to, 41

Fenton, Carroll Lane, bib. 182

Ferruginous rough-leg hawk, 38, 41, 139

Fish hawk, 38, 175

Fisher, A. K., 53, bib. 55, 62, 92, 95,

143, 153, 167, 204, 224

Fishing eagle, 175

Forest City, short-eared owl from, 190

G

Gabrielson, Ira N., bib. 50, 184

George, F., bib. 49

Godly, A. P., bib. 55

Golden eagle, 38, 41, 142

value of, 143

Goshawk, 38, 42

Mexican, 38, 132

western, 38, 88

Goss, H. S., bib. 49, 57, 70, 76, 96, 120,

143, 232

Gray owl, 208

Great-footed falcon, 157

Great gray owl, 38, 43, 201

Great horned owl, 38, 43, 214

food of, 217

habits of, 215

nest of, 216

Greenwood, O. M., 179

Grinnell, long-eared owl at, 184

pigeon hawk near, 163

sharp shinned hawk at, 70

Ground owl, 231

H

Haliaeetus, 147

leucocephalus leucocephalus, 147

Halvorsen, M. E., 190

Hamburg, goshawk from, 84

Hancock county, duck hawk from, 158

marsh hawk from, 61

short-eared owl from, 190

Harlan, E. R., 34

Harlan's hawk, 38, 41, 112

Harriers, 51, 59

Harris, S. N., 125

Harris's hawk, 38, 91

Hatch, P. L., bib. 49

Hawk, big blue chicken, 83

big blue hen, 83

big chicken, 119

black, 133

blue, 59

blue hen, 74

broad-winged, 38, 42, 125

chicken, 74, 115

Cooper's, 38, 42, 74

duck, 38, 42, 157

fish, 38, 175

ferruginous rough-leg, 38, 139

Harlan's, 38, 41, 112

Harris's, 38, 91

hen, 93

Iowa broad-winged, 38, 120

Krider's, 38, 41, 108

little chicken, 69

little hen, 74

marsh, 38, 42, 59

mouse, 169

pigeon, 38, 43, 162

red-shouldered, 38, 42, 115

red-tailed, 38, 41, 93

rough-legged, 38, 42, 133

St. John's, 133

sharp-shinned, 38, 43, 69

slate-colored, 69

sparrow, 38, 43, 45, 169

Swainson's, 38, 119

Hawk owl, 38, 44, 228

Hawks, 51

food of, 44

key to, 41

Hawks and Owls, habitats of, 38

securing data on, 20

species of, 38

use of, 19

Hegner, Robert, bib. 106

Hen-hawk, 93, 115

Henning, Carl Fritz, bib. 50, 63

Henshaw, W. H., bib. 104

Hill, Thos. S., bib. 188

Hillsboro, great-horned owl from, 218
 Harris's hawk from, 91
 Himmel, W. J., 84
 Hoeg, Christ, 34
 Homestead, saw-whet owl from, 204
 Hoot owl, 194, 214
 Hornaday, W. T., bib. 107
 Hortinger, Clarence, bib. 106

I

Ictinia, 56
mississippiensis, 56
 Independence, swallow-tailed kite from, 53
 Iowa, life zones in, 39
 topography of, 34
 Iowa broad-winged hawk, 38, 130
 Iowa City, western goshawk from, 89
 Iowa river, red-shouldered hawk from, 116
 Irons, Ernest, bib. 106

J

Jay, James C., bib. 104
 Jayne, Arthur, 148
 Jones, Lynds, 47, bib. 49, 140, 163, 170, 193, 216
 Jordan, D. S., bib. 104
 Joy, James C., bib. 220

K

Kay, G. F., 33
 Keeler, Charles A., bib. 106
 Kelsey, Carl, bib. 49
 Keokuk, short-eared owl from, 190
 Key to owls, 43
 Keyes, Charles Reuben, 27, 47, bib. 50, 116, 119, 148, 179, 216, 217
 Keyes, Charles Rollin, bib. 49
 Kirkpatrick, C. D., 217
 Kirtland's owl, 45
 Kite, Mississippi, 38, 43, 56
 Kite, swallow-tail, 38, 42, 51
 Kites, key to, 41
 Knight, O. W., bib. 106
 Knowlton, F. H., bib. 161
 Krider's hawk, 38, 41, 108
 red-tail, 108
 Krider, Jno., bib. 104
 Kubichek, Wesley, 88
 Kurata, T. B., 33

L

Lake View, burrowing owl from, 233
 Law, J. Eugene, 207
 Lazell, F. J., 216
 Lee county, pigeon hawk from, 163
 Linn county, bald eagle from, 148
 See also Cedar Rapids, Marion
 Little chicken hawk, 69
 hen hawk, 74
 hoot owl, 208
 Lloyd, bib. 105
 Long-eared owl, 38, 43, 183
 food of, 185
 habits of, 184

M

Macoun, Jas., bib. 107
 Macoun, Jno., bib. 107
 Manchester, barn owl from, 179
 Maps, distributional records on, 45
 Marion, long-eared owl from, 184
 pigeon hawk from, 163
 Marsh hawk, 38, 42, 59
 food of, 62
 Marsh owl, 189
 Maxmillian, Prince zu Wied, bib. 54

McNair, George T., 33
 Mexican goshawk, 38, 132
 Mississippi kite, 38, 43, 56
 habits of, 57
 in Iowa, 12
 near Burlington, 57
 near Omaha, 57
 Monkey-faced owl, 178
 Moore, Andy, bib. 151
 Moore, Russell, 157
 Mosher, A. A., bib. 151
 Mount, Tom, bib. 166
 Mount Vernon, barn owl from, 179
 turkey buzzard from, 47
 Mouse hawk, 169
 Museum, Coe College, 15

N

New Albin, sharp shinned hawk from, 70
 Norris, H. W., 34
 Norris, J. Parker, bib. 65, 105
 Nuttall, Thomas, bib. 104
 Nutting, C. C., 33, 153, 167
Nyctea, 223
nyctea, 223

O

Oberholser, H. C., 27
 Omaha, Mississippi kite from, 57
 Orr, Ellison, bib. 78
 Osborn, Herbert, bib. 49
 Osprey, 41, 175
 habits of, 176
Otus, 208
 asio asio, 208
 Owl, Acadian, 203
 barn, 38, 44, 178
 barred, 38, 43, 194
 big horned, 214
 burrowing, 38, 44, 231
 cat, 214
 gray, 208
 great grey, 38, 43, 201
 great horned, 38, 43, 214
 ground, 231
 hawk, 38, 44, 228
 hoot, 194, 214
 Kirtland's, 45
 little hoot, 208
 long-eared, 38, 43, 183
 marsh, 189
 monkey-faced, 178
 prairie, 189
 red, 208
 Richardson's, 45
 saw-whet, 38, 44, 203
 screech, 38, 43, 45, 208
 short-eared, 38, 44, 189
 snowy, 38, 43, 223
 western horned, 38, 43
 white, 223
 Owls, key to, 43

P

Paarman, J. H., 34
 Palisades on Cedar River, duck hawk from, 157
 turkey buzzard from, 47
 great horned owl from, 216
Pandion, 175
 haliaetus carolinensis, 175
Pandionidae, 175
Parabuteo, 91
 unicinctus Harris, 91
 Peck, George D., 52
 Peck, Morton E., 47, 52, bib. 78
 Pellett, Frank C., 34, bib. 72, 96, 170
 Peterson, Ben H., 33
 Pigeon hawk, 38, 43, 162
 Richardson's, 38, 167

Plumage in red-tailed hawk, 97
 Porter, A. F., 34
 Prairie Falcon, 38, 152
 nesting habits of, 153
 Prairie owl, 189
 Preston, J. W., 47, bib. 49, 184
 Primaries, 40

R

Raptores, 46
 Rawson, Calvin, bib. 104
 Red Cedar river, bald eagle from, 148
 Red owl, 208
 Red-shouldered hawk, 38, 42, 115
 Red-tailed hawk, 38, 41, 93
 food of, 95
 habits of, 94
 plumage in, 97
 value of, 96
 Red-tailed hawk, eastern, 93
 Red-tail, black, 112
 Krider's, 38, 108
 western, 38, 41, 110
Rhynchodon, 157
 Rich, G. S., bib. 166
 Richardson's owl, 45
 Richardson's pigeon hawk, 38, 167
 Ridgway, Robert, 27, bib. 49, 88, 132, 153
 Rough-legged hawk, 38, 42, 133
 dark phase of, 42
 value of, 135
 Rough leg, ferruginous, 38, 41, 139

S

St. John's hawk, 133
 Samuels, E. A., bib. 104
 Savage, David L., bib. 66, 204
 Savage, Walter G., bib. 50, 91, 132, 218
 Saw-whet owl, 38, 44, 203
 Say, Thomas, bib. 48
Scotiapterx, 201
 nebulosa nebulosa, 201
 Scott, J. H., 30, 53, 125
 Screech owl, 38, 43, 45, 208
 plumage of, 209
 value of, 45, 210
 Searles, W. W., bib. 55
 Sharp-shinned hawk, 38, 43, 69
 damage by, 70
 Sheldon, Frank W., bib. 49, 171
 Sheldon, Miss S. G. F., 34
 Shellhorn, Joseph, 84, 88
 Shoemaker, Frank H., bib. 50
 Short-eared owl, 38, 44, 189
 nest of, 190
 Sioux City, barn owl from, 179
 burrowing owl from, 233
 goshawks from, 84
 Snowy owl, 38, 43, 223
 habits of, 224
 Soutter, C. B., 33
 Sparrow hawk, 38, 43, 45, 169
 food of, 170
 nesting of, 170
 value of, 45
 Spencer, Clementina Sinclair, 33
Speotyto, 231
 culicularia hypogaea, 231
 Spirit Lake, turkey buzzard from, 47
 Stephens, T. C., 27, 84
 bibliography of, 27, 49
 Stoddard, H. L., 204
 Stone, Witmer, bib. 55
 Stoner, Dayton, 27
 Storm Lake, pigeon-hawk from, 167
 prairie falcon from, 153
 Story county, short-eared owl from, 190
 saw-whet owl from, 204
Striges, 178

Strigidac, 183
Strix, 194
 varia varia, 194
 Strode, W. L., bib. 145
 Stromsten, F. A., 30
Surnia, 228
 ulula caparoch, 228
 Swallow-tailed kite, 38, 42, 51
 value of, 53
 Swainson's hawk, 38, 119
 habits of, 120
 Swenk, M. H., bib. 50

T

Tail, extent of, 40
 Tarsus, extent of, 40
 Thiesen, Harold, 84
 Thompson, A. V., bib. 144
 Tinker, A. D., bib. 188
Tinnunculus, 162
 Topography, distribution related to, 34
 Townsend, Manley P., bib. 50
 Trippe, T. M., bib. 49
 Trostler, Isadore, bib. 49
 Turkey buzzard, 46
 vulture, 38, 46

U

Upper Iowa river, turkey buzzard from, 47

V

Van Buren county, great horned owl from, 218
 Harris's hawk from, 91
 Mexican goshawk from, 133
 Van Vleck, B. H., bib. 104
 Vennor, H. G., bib. 104
 Vincent, E. F., bib. 49
 Vulture, turkey, 38, 46
 Vultures, 51
 American, 46

W

Walcott, R. H., bib. 50
 Wall Lake, burrowing owl from, 233
 Wandering falcon, 157
 Ward, Henry, 61, 158
 Ward, James, 158
 Warren, B. H., bib. 49, 96, 104
 Warsaw, Illinois, western goshawk from, 89
 Washington, D. C., duck hawk from, 158
 Waubeck, bald eagle near, 148
 Webster, E. B., 47, bib. 65
 Western goshawk, 38, 88
 in Iowa, 12
 Western horned owl, 38, 43
 Western Red-tail, 38, 41, 110
 Wetmore, Alexander, 185
 Whitcomb, Seldon L., bib. 171
 White, H. G., bib. 78
 White headed eagle, 147
 White owl, 223
 Wickham, H. F., 27
 Wild, Doc., bib. 151
 Williams, H. S., bib. 49
 Williams, John, bib. 182
 Williams, Mrs. V. S., bib. 198
 Wilson, Alexander, bib. 104
 Wilson, B. H., bib. 66
 Wing, extent of, 40
 Winnebago county, pigeon hawk from, 163
 Woodruff, R. M., bib. 50
 Woods, Paul C., bib. 79
 Worthen, Charles K., 88

Biology Library

Renewed books are subject to immediate recall.

[illegible]

General Library
University of California
Berkeley