

the character of the nesting-site and the habits of the bird in the nesting-time are known, other nests will be found.

The futility of former search for the nest has probably been due to two causes. The first is that the nesting-site is unusual for a shore-bird, in that it is placed high up on rocky plateaus far from the sea; the second is that the bird so closely resembles the environment in which the nest is placed that it feels sure of escaping detection, and does not flush even when in danger of being stepped upon.

MIGRATION RECORDS FOR KANSAS BIRDS.

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I.

INTRODUCTION.

The list of the birds of Kansas, published in 1913, by Mr. Bunker,¹ showed 379 species and subspecies that had been taken or authentically observed in the state. More recent unpublished revisions conducted under his direction have increased the list somewhat. The large collection of the museum and the careful manner in which the work has been done vouches for the reliability of these results.

Of the list of 379 as published 29 are accidental occurrences or are not found within the limits of the state. Ten are very rare; 79 others are listed as rare; and 23 of those remaining are subspecies or varieties, usually one eastern and the other western in distribution, which are of interest only to the taxonomist and are often not distinguishable except by computing averages of many specimens.

While all such should be taken into account in any exhaustive list of the birds of the state it is of course incorrect to say that Kansas is populated by nearly 400 species of birds. It is of course often a matter of judgment as to

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whether a given bird shall be considered very rare or rare or not rare. Besides some of the "rare" birds are as plentiful here as elsewhere in their range, but a fair consideration seems to place the number of those that can be considered bona fide Kansas birds at 220. If we include those that are rare but omit those that are very rare the list is increased to 300. Twenty-four of the not rare occur only in western Kansas, though many of this list are merely subspecies, scarcely distinguishable from the eastern form. Twenty-one occur only in the eastern part and four or more occur only along the southern border.

Analyzing the population still further we see that 42 of the 220 that are not rare are year-round residents; 98 are summer residents; 11 are winter residents only, and 82 are migrants. Here again, however, much depends upon the judgment, for many, such as bluebirds and robins and flickers migrate for the most part, but remain in small numbers; others, such as many of the migrating ducks, may occasionally spend the winter or summer with us.

It is the purpose of this paper to deal with the times of migrations and not the causes, but a word will not be amiss on this latter subject. It is almost universally agreed by those who have given the subject consideration that the primary controlling factor of migration is the food supply. Birds are better equipped than any other animals to withstand cold. But when cold weather cuts off the supply of insects and when snows threaten to cover up the plentiful supply of seeds there is nothing else to do but go where food may be had. In the spring, warblers and cuckoos may not come back until leaves appear, since they gather their food from the leaves. Flycatchers and swallows may not appear until insects are flying. Those that come early and those that spend the winter with us must have some source of food which they can depend upon. Instinct, however, which is a safe guide, comes in to supplant this primal impulse in guiding the bird's actions. Usually it does not change the time of migration a great deal, though we have many birds such as the pro-

thonotary warbler, orioles, and many others leaving just when food becomes most plentiful. Thus we see that migration is not merely a response to appetite.

II.

MATERIALS AND METHODS.

The data upon which this article is based are from two sources: museum records and field observations. My thanks are due to Mr. Bunker in charge of the museum collection here, who has placed at the writer's disposal the records of the museum collection which show the date upon which each specimen in the museum was taken. These records have supplied many data, all of which are of absolute reliability. My thanks are also due to Professor Frank Smith, of the University of Illinois, for the use of his unpublished data on the migration of Illinois birds covering a period of nine years. The writer, likewise, made daily trips in the fall migration season of 1916 and the spring of 1917, making careful records of all birds observed. In this work only absolute and unquestionable identifications have been recorded. Many birds seen, especially warblers and sparrows, had thus to be left off of the records even when the identification was fairly positive. For many of the more difficult birds dependence was placed entirely upon museum specimens. The field records here reported are considered to be above question. Circumstances, likewise, did not permit much study of the water birds. Records were also kept of the weather conditions and of the places visited and of the likelihood that birds would be found and allowances made for these. Likewise, it was recorded, where significant, whether the birds were seen in one flock or in different places.

In keeping records, close attention was given to the question whether the bird was to be expected in the locality visited and whether the bird was seen or heard, since the activity of the bird has much to do with its discovery. If a given bird was looked for in its proper habitat and not found a circle with a dot in the center was used to in-

dicating this; two dots meant an unusually careful search. If the fewness of those found seemed to indicate early arrival or the last to remain, a square below was used to indicate this.

Unless otherwise stated the fall dates given are for the year 1916, the spring dates for 1917.

PART III.

WATER BIRDS.

FAMILY COLYMBIDAE—GREBES.

3. *Colymbus auritus*—Horned Grebe.

A rare migrant. One specimen in the museum taken November 15, 1906, in Rice County.

4. *Colymbus migricollis californicus*—Eared Grebe.

Not common migrant or winter resident. There are four museum records for this species from April 14 to 24.

6. *Podilymbus podiceps*—Pied-billed Grebe.

A common migrant and rare summer resident. One was taken March 12 and seven between April 3 and May 13. The fall records show 38 between September 10 and October 31, and one November 15.

FAMILY GAVIIDAE—LOONS.

7. *Gavia immer*—Loon.

A rare migrant. There are six museum records between March 27 and May 23, and one for October 27.

FAMILY LARIDAE—GULLS AND TERNS.

51. *Larus argentatus*—Herring Gull.

A rare migrant and winter resident. The museum contains several specimens taken in winter and one on April 12.

54. *Larus delawarensis*—Ring-billed Gull.

A common migrant. Kansas is within the winter range, but there are no records of them in this season. The spring and fall records are not sufficient to show the range of the migration season. Specimens were taken on March 21 and 29 and four between October 12 and 22.

59. *Larus franklini*—Franklin Gull.

A rather common migrant. Seven specimens were taken by museum between April 1 and May 6 and four between October 20 and November 1.

60. *Larus philadelphia*—Bonaparte Gull.

A rare migrant. The one record is for March 6, 1903.

69. *Sterna forsteri*—Foster's Tern.

A not uncommon migrant. Kansas is within the summer range of this species, but there is no record of summer residence. There are four records between April 29 and May 11.

70. *Sterna hirundo*—Common Tern.

Rarely observed as a migrant. Kansas is within the summer range. No records in Kansas museum.

74. *Sterna antillarum*—Least Tern.

An intermittently common summer resident. No records of migration movements.

77. *Hydrochelidon nigra surinamensis*—Black Tern.

A common migrant and rare summer resident. These first observed about Lawrence in 1917 on May 7. Large numbers were daily observed between May 27 and June 4. Museum and field records are plentiful from September 3 to 14.

FAMILY PHALACROCORACIDAE—CORMORANTS.

120. *Phalacrocorax auritus auritus*—Double-crested Cormorant.

A rather common migrant. Southern Kansas is within the general winter range. There are ten museum records of this species from April 8 to May 15, and from August 27 to November.

FAMILY PELECANIDAE—PELICANS.

125. *Pelecanus erythrorhynchos*—White Pelican.

A rather common migrant. Specimens have been found in Kansas from April 16 to May 22, and from October 6 to 12.

FAMILY ANATIDAE—DUCKS, GEESE, AND SWANS.

129. *Mergus americanus*—Merganser.

A not uncommon winter resident. It has not been observed by the writer. There are a few museum records for the winter months and one for April 11.

130. *Mergus serrator*—Red-breasted Merganser.

A rare winter resident. There are museum records for April 3 and April 19.

131. *Lophodytes cucullatus*—Hooded Merganser.

A rare winter and summer resident and a common migrant. There are no data available as to migration.

132. *Anas platyrhynchos*—Mallard.

A common migrant and rare winter or summer resident. Mallards vary much in their movements, according to season. If the season be open they begin moving early in February, while in other conditions they may not begin to move till well along in March. Their stay is short, though individuals, apparently not summer residents, may remain till the middle of April. Fall migration, late September and October, and up to cold weather.

133. *Anas rubripes*—Black Duck.

A rare migrant. There are three museum records, October 21 to November 25, the latter in Pratt County.

134a. *Anas fulvigula maculosa*—Mottled Duck.

A rare migrant. One observed October 6.

135. *Chaulelasmus streperus*—Gadwall.

A common migrant and rare summer resident. Probably a rare winter resident. Five museum records between March 20 and April 11, and one for October 28; one also for February 22.

137. *Mareca americana*—Baldpate.

A common migrant and rare summer resident. Kansas is within the winter range. Museum records show migration between March 2 and April 18.

139. *Nettion carolinense*—Green-winged Teal.

A common migrant and rare winter resident. Museum and fall records show migration from March 2 to April 20, and from October 6 to November 19. There are records also for December and February.

140. *Querquedula discors*—Blue-winged Teal.

A common migrant and occasional summer resident. Abundant field notes for the spring of 1917 show first observation March 30; common April 6; still fairly common May 20. Seen in fall on October 6.

141. *Querquedula cyanoptera*—Cinnamon Teal.

As a migrant, rare in eastern Kansas, common in western Kansas. A specimen was taken in Rice County on April 24. There is no other record of time of migration at hand.

142. *Spatula clypeata*—Shoveller.

A common migrant and rare summer resident. Kansas is within the winter range. It was abundantly observed from March 15 to May 7 and on October 28.

143. *Dafila acuta*—Pintail.

Migrant and winter resident. Twenty-four specimens in the museum were taken February 12 to April 23, mostly from vicinity of Lawrence. They should return about October 1st and remain until the rivers freeze over.

144. *Aix sponsa*—Wood Duck.

Now nearly extinct. The museum contains five specimens, taken between March 15 and May 9, and specimens also on October 17 and 24.

146. *Marila americana*—Redhead.

A common migrant, remaining but a short time, in both spring and fall. Seven specimens were taken by the museum from March 6 to 28. In the fall they should return about October 1 and remain but a short time.

147. *Marila valisineria*—Canvas-back.

A common migrant. There are nine museum specimens from March 7 to April 5, which agrees with records of other localities. There are no records of fall migration at hand.

148. *Marila marila*—Scaup Duck.

A rare migrant. No data at hand.

149. *Marila affinis*—Lesser Scaup Duck.

A fairly common migrant. Twenty-three specimens have been taken by the museum between March 1 and May 22. They were observed in considerable numbers in 1917 from May 14 to May 20. The writer has no fall records.

150. *Marila collaris*—Ring-necked Duck.

A migrant now rare. It has been taken by the museum from February 12 to March 26.

151. *Clangula clangula americana*—Golden-eye.

A rare migrant. Three specimens in museum taken March 2 and 19.

152. *Clangula islandica*—Barrow's Golden-eye.

As a winter resident, rare. There are two records for December 11 and four from March 10 to 27.

153. *Charitonetta albeola*—Buffle-head.

This species is a common migrant. This state is within the winter range. There are five museum specimens taken from March 5 to 19 and one on November 9.

167. *Erismatura jamaicensis*—Ruddy Duck.

Now a rare migrant. Kansas is within summer range of this species. Twelve specimens have been taken by museum between March 28 and May 6.

169. *Chen hyperboreus hyperboreus*—Lesser Snow Goose.

A common migrant. Kansas is within its winter range. The only museum records are for April 3 and 8.

169. *Chen caerulescens*—Blue Goose.

A rare migrant. The only museum specimen bears date March 18.

171a. *Anser albifrons gambeli*—White-fronted Goose.

A common migrant. The two museum records are for February 14 and March 1.

172. *Branta canadensis canadensis*—Canada Goose.

A common migrant. This goose migrates very early, sometimes in January. The migration is over about March 15. They return in late September, October and November.

172a. *Branta canadensis hutchinsi*—Hutchin's Goose.

This goose is a common migrant. Its winter range comes within Kansas. The two specimens at museum were taken March 2 and April 3.

180. *Otor columbianus*—Whistling Swan.

A not uncommon migrant and winter resident. They have been

captured by museum on December 11, April 1, April 6, April 26, and in the winter months. They do not arrive till late in the fall.

181. *Olor buccinator*—Trumpeter Swan.

A rare migrant. The only record is for March 23, 1888.

FAMILY IBIDIDAE—IBISES.

An interesting feature of this group of heron-like birds is that the southern species, which make up the main part of the group, will often wander far north of their breeding range after nesting.

187. *Plegadis guarauna*—White-faced Glossy Ibis.

This species rarely wanders over Kansas after breeding season.

FAMILY ARDEIDAE—BITTERNS, HERONS, ETC.

190. *Botaurus lentiginosus*—Bittern.

A common summer resident. They were seen daily in 1917 after May 10, though none were observed before. Museum records, however, show specimens taken on April 4, 13, 16, 23, 26, 28 and 30. The thoroughness of the field work in April over regions where they later appeared makes it seem probable that they came later this year on account of the backwardness of the season. The last museum record is November 5. Records of other states make it appear probable that they remain somewhat later.

191. *Ixobrychus exilis*—Least Bittern.

A not uncommon summer resident. They come later and leave earlier than the last. Four specimens in museum taken between May 14 and 28. Records from other states would make it probable that they come somewhat earlier.

194. *Ardea herodias herodias*—Great Blue Heron.

A common summer resident. Museum and field records show residence from March 20 till September 15. Other states show records which makes it seem probable that they come somewhat earlier than this and remain somewhat later.

196. *Herodias egretta*—Egret.

After the breeding season is over, egrets, whose summer home is considerably south of Kansas, will not infrequently wander over the state.

197. *Egretta thula thula*—Snowy Heron.

This heron likewise wanders over Kansas after the close of the breeding season.

200. *Florida carulea*—Little Blue Heron.

This bird rarely strays over the state after the breeding season.

201. *Butorides virescens virescens*—Green Heron.

A common summer resident. Museum and field notes show the first arrival as April 27. They begin to leave about September 1; the last record being September 16.

202. *Nycticorax nycticorax navius*—Black-crowned Night Heron.

A rare summer resident. The first museum record is April 8; the last September 28. They probably remain later.

203. *Nyctanassa violacea*—Yellow-crowned Night Heron.

Rare as summer resident. They probably come later than the last.

FAMILY GRUIDAE—CRANES.

204. *Limnogeranus americanus*—Whooping Crane.

A rare migrant. The one museum record is for October 13, 1906, in Ford County, Bucklin.

205. *Grus canadensis*—Little Brown Crane.

A common migrant, but not seen by writer in 1917. The one specimen at museum bears date of April 1.

206. *Grus canadensis mexicana*—Sandhill Crane.

A common migrant. They should pass through about March 15 to May 15 and return from about September 20 on into November. The writer has seen them in the first half of May.

FAMILY RALLIDAE—RAIL, GALLINULES AND COOTS.

208. *Rallus elegans*—King Rail.

A common summer resident. Museum and field notes give April 11, 17 and 23 and indicate the date of spring arrival. The last fall record is October 10.

212. *Rallus virginianus*—Virginia Rail.

This rail is a common migrant and a very rare summer resident. The writer has no records of this species. The notes from other states show that it should come about May 1 and return about September 15. Each season of migration is brief.

214. *Porzana carolina*—Sora.

A common summer resident. Museum and field records show that they arrive about May 10 (earliest record May 11) and are common thereafter. They leave mostly in September. The last museum record is October 10.

215. *Coturnicops noveboracensis*—Yellow Rail.

A rare summer resident. The only museum records are April 6 and 18 and October 1.

216. *Creciscus jamaicensis*—Black Rail.

Classed as a rare summer resident. No records of migration.

218. *Ionornis martinicus*—Purple Gallinule.

Occasional; probably wanders after breeding season, since Kansas is north of regular breeding area.

221. *Fulica americana*—Coot.

A common summer resident. The coot varies greatly from year to year in migration movements. None were seen in 1917 till May 10, after which they were observed daily. They have been taken on March 29. One specimen in museum bears date of October 10.

FAMILY PHALAROPODIDAE—PHALAROPES.

223. *Lobipes lobatus*—Northern Phalarope.

A rare migrant. No records.

224. *Steganopus tricolor*—Wilson's Phalarope.

A common migrant. The earliest record of Wilson's Phalarope is April 24. They were common until May 15, and there is one record for May 29. According to notes from other localities the female should begin returning south the middle of July, and the males and young should be gone for the most part by the middle of August.

FAMILY RECURVIROSTRIDAE—AVOCETS AND STILTS.

225. *Recurvicostra americana*—Avocet.

A common migrant and rare summer resident. Museum records for this species are as follows: April 11, Douglas County; April 16, southern Kansas; April 24 (2), Rice County; October 3, Douglas County; October 20, Osborne County.

FAMILY SCOLOPACIDAE—SNIPES, SANDPIPERS, AND CURLEWS.

230. *Gallinago delicata*—Wilson's Snipe.

A very common migrant. In 1917 they first appeared on March 27. Thereafter they were abundant until April 24, when they became distinctly fewer in numbers, though still fairly common. The last specimen was seen on May 21. One was collected in Pratt County on March 1. Incomplete fall records show presence from October 10 to 22. They probably continue until well into November.

232. *Macrorhamphus griseus scolopaceus*—Long-billed Dowitcher.

A common migrant. It was not observed in the field by the writer. There are museum records for April 18 and 29, and October 6 and 10.

233. *Micropalama himantopus*—Stilt Sandpiper.

A common migrant. It was not observed in the field. The museum records for April 28, May 1, 9, September 9, and October 10, are too incomplete to indicate the range of migration.

239. *Pisobia maculata*—Pectoral Sandpiper.

A common migrant. Abundant records from March 16 to May 21 show that this is the period of spring migration. They should return in September and October. The one fall record is for November 3.

240. *Pisobia fuscicollis*—White-rumped Sandpiper.

A common migrant. Abundant spring records show them present from April 29 to May 17. One specimen was taken in Clark County June 10.

241. *Pisobia baird*—Baird's Sandpiper.

A migrant not common. There are five records in the museum catalogue from April 11 to 19.

242. *Pisobia minutilla*—Least Sandpiper.

A common migrant. Museum records extend from April 22 to May 21. Field observations in 1917 show them common only in the early part of May. No data at hand on fall movements.

243a. *Pelidna alpina sakhalina*—Red-backed Sandpiper.

A rare migrant. The one museum record is May 11, 1885.

246. *Ereunetes pusillus*—Semipalmated Sandpiper.

A common migrant. This species was not identified in the field. Twenty museum records extend from April 29 to May 20.

247. *Ereunetes mauri*—Western Sandpiper.

An occasional migrant. Nine museum records extend from May 1 to June 1.

249. *Limosa fedoa*—Marbled Godwit.

An occasional migrant. The only record is for Shawnee County, April 21.

251. *Vetola hæmastica*—Hudsonian Godwit.

A rare migrant. Ten museum records are from April 19 to May 13.

254. *Glottis melanoleuca*—Greater Yellow-legs.

A common migrant. Abundant museum and field records show the migration to be from March 26 to April 21. One was observed May 13. The only fall records at hand are for September 29 and October 29.

255. *Iliornis flavipes*—Yellow-legs.

This species, likewise, is a common migrant. The first record is on March 29. They are abundant on the records from April 16 to June 1. The fall migration should be in August and September.

256. *Helodromas solitarius solitarius*—Solitary Sandpiper.

A common migrant. Abundant museum and field records show the spring migration to be from April 6 to May 14. Three full records are at hand, July 29, September 19, October 5.

258. *Catoptrophorus semipalmatus semipalmatus*—Willett.

An occasional migrant. The specimens were taken on May 6, 1909.

258a. *Catoptrophorus semipalmatus inornatus*—Western Willett.

Also an occasional migrant. Five specimens were taken by museum from April 24 to 27, and two in Pratt County on May 3.

261. *Bartamia longicauda*—Upland Plover.

A fairly common summer resident. They should arrive in April and leave about September 1.

262. *Tryngites subruficollis*—Buff-breasted Sandpiper.

A rare migrant. The only two records at hand are for April 29.

263. *Actitis macularia*—Spotted Sandpiper.

A common summer resident and more abundant migrant. They were very abundant in 1917 from May 1 to 20. Specimens were taken by museum in previous years on April 7 and 20. They should leave early in September.

264. *Numenius americanus*—Long-billed Curlew.

A common migrant and rare summer resident. They were not observed in field by writer. The migration should be mainly in May and September. One museum specimen taken April 19.

FAMILY CHARADRIIDAE—PLOVERS.

270. *Squatarola squatarola*—Black-bellied Plover.

An occasional migrant. There are two museum records, May 22 (Wichita County), and October 29.

272. *Charadrius dominicus dominicus*—Golden Plover.

Common spring migrant. In the fall, however, it flies from Canada across the Atlantic to South America. This species was not observed in the field by the writer. Its migration should be mostly in April. Specimens have been taken by the museum on March 29 and April 1. One was also taken on October 23, 1910, which would indicate that rarely they return south by the inland route.

273. *Oxyechus vociferus*—Killdeer.

An abundant summer resident. In 1917 it was observed abundantly in the field on April 13, and daily thereafter. They leave for the most part by the middle of October, though one specimen in museum bears date of November 27.

274. *Charadrius semipalmatus*—Semipalmated Plover.

A migrant, but not common. Twelve specimens have been taken by the museum from April 22 to May 15, and one on September 19.

277. *Charadrius melodus*—Piping Plover.

Rare. Kansas is within the breeding ground. One specimen taken by the museum on April 27.

278. *Leucopholus nivosa alexandrinus*—Snowy Plover.

A rare summer resident in southwestern Kansas. One was taken in Douglas County April 22. Three were captured in Clark County on June 6.

281. *Podasocys montanus*—Mountain Plover.

A common summer resident in western Kansas. The only migration record of the museum is one taken in Haskell County on May 15.

(Continued in March issue.)