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DISTRIBUTION AND MIGRATION OF NORTH AMERICAN HERONS AND THEIR ALLIES

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Biological Survey

DISTRIBUTION AND MIGRATION OF NORTH AMERICAN HERONS AND THEIR ALLIES.

INTRODUCTION.

The herons have attracted wide attention during late years, particularly because of the earnest efforts that have been made to prevent the utter destruction of the aigrette-bearing members of the family. The horrors necessarily attending the collection of the aigrettes have aroused bird lovers to unprecedented activity. As a result, in some parts of the Union stringent laws have been enacted, and the State machinery for bird preservation has been supplemented by large private subscriptions. Probably no family of birds ever had fuller protection on the statute books than is now enjoyed by the herons, while certainly no birds have ever been the recipients of more zealous care than is now accorded to the remaining colonies of the larger and smaller egrets.

The friends of the birds became aroused none too soon. The large breeding colonies of egrets have been completely destroyed, and only a few scattered remnants exist to serve as centers for reestablishing the species.

Most herons are colony breeding birds, and this fact has been one of the most potent factors in bringing about their destruction. A colony could easily be discovered by watching the lines of flight to and from the feeding grounds, and the succeeding operations were woefully simple. The hunter merely waited until the eggs hatched and then, taking his stand within the colony, shot the parent birds as they brought food to the young. No matter how much shooting was done, the old birds—then bearing the nuptial plumes in their greatest perfection—continued to return to their hungry young until the last one was killed. The starving of the young and the utter extinction of the colony were necessary sequels.

So long as these plumes could be sold for their weight in gold and there was an unlimited market for them, neither State laws nor the efforts of zealous game wardens availed much in checking the slaughter. More hopeful conditions are being secured at the present

time by decreasing the market. Already in several of the States it has been made unlawful to sell the aigrettes or even to have them in possession with intent to sell. Could such a law be made general throughout the United States, the killing of aigrette-bearing birds would cease, because the slaughterer would have no market for his plumes. The birds will never be safe until this condition exists.

The larger egret and the snowy egret are the two species that have suffered most severely from the persecutions of the plume hunters, but the millinery trade has also levied a heavy toll on many other members of the group. The flamingo has ceased to breed anywhere in the United States. The roseate spoonbill has become extinct over more than half of its former range in the United States, and its total numbers are probably less than 5 per cent of what they were 50 years ago.

The reduction of numbers in the other herons and in the ibises has not been so pronounced, but several of the species have been driven from the northern two-thirds of their former breeding range and are now restricted to the wildest and most inaccessible parts of the Gulf States.

The food habits of herons and heronlike birds have not been thoroughly investigated. The flamingo is believed to subsist largely on shellfish and crustacea. The spoonbill and the ibises partake of the same fare, but add insects to the bill. The larger wood ibis feeds also on frogs and fishes.

All of the true herons are fond of fish, but in addition they consume many injurious creatures, such as crawfish, water snakes, meadow mice, and other rodents. In the West the great blue heron spends much of its time hunting for pocket gophers. There is no doubt that the herons—especially the black-crowned night heron and the great blue heron—do much damage about fish hatcheries and ponds used as fish preserves, and in such places they should be held in check. But their food habits have redeeming features, and pending conclusions based on careful study of the whole subject, no general aggressive measures against the birds should be permitted.

DISTRIBUTION.

The herons and their allies as a whole are tropical birds, barely extending to the warmer parts of the southern United States. This bulletin treats of 32 species, all that are known to occur in North America south to and including the West Indies and Panama.

One of these, the European heron, is accidental in Greenland; two are stragglers to the southern United States; and several have never been taken within the limits of the United States.

SOUTHERN SPECIES NOT RANGING NORTH TO THE UNITED STATES.

Scarlet ibis (*Guara rubra*). Accidental five times in the United States.
Cayenne ibis (*Harpiprion cayennensis*).
Jabiru (*Jabiru mycteria*). Accidental once in the United States.
Zeledon boatbill (*Cochlearius zeledoni*).
Pinnated heron (*Botaurus pinnatus*).
Lembeye green heron (*Butorides brunescens*).
Striated heron (*Butorides striata*).
Agami heron (*Agamia agami*).
Pileated heron (*Pilherodius pileatus*).
Lineated tiger-bittern (*Tigrisoma lineatum*).
Nicaraguan tiger-bittern (*Tigrisoma excellens*).
Mexican tiger-bittern (*Heterocnus cabanisi*).

SPECIES OCCURRING DURING THE BREEDING SEASON NOT FARTHER NORTH THAN THE SOUTHERN PART OF THE UNITED STATES.

Flamingo (*Phoenicopterus ruber*). No longer breeds in the United States, but occurs as a rare visitor.
Roseate spoonbill (*Ajaia ajaja*).
White ibis (*Guara alba*).
Glossy ibis (*Plegadis autumnalis*).
Wood ibis (*Mycteria americana*).
Great white heron (*Ardea occidentalis*).
Egret (*Herodias egretta*).
Snowy egret (*Egretta candidissima*).
Reddish egret (*Dichromanassa rufescens*).
Louisiana heron (*Hydranassa tricolor ruficollis*).
Little blue heron (*Florida caerulea*).
Yellow-crowned night heron (*Nyctanassa violacea*).

SPECIES OF WIDE RANGE IN THE UNITED STATES AND CANADA DURING THE BREEDING SEASON.

White-faced glossy ibis (*Plegadis guarauna*).
Bittern (*Botaurus lentiginosus*).
Least bittern (*Ixobrychus exilis*).
Cory least bittern (*Ixobrychus neoxenus*).
Great blue heron (*Ardea herodias*).
Green heron (*Butorides virescens*).
Black-crowned night heron (*Nycticorax nycticorax naevius*).

SUMMARY.

Species of wide range in the United States	7
Species ranging north to the southern United States	12
Species not ranging north to the United States	10
Tropical species occurring as stragglers in the United States	2
Species occurring as a straggler from Europe	1
Total	32

MIGRATION.

The herons that breed south of the United States are for the most part nonmigratory. The same is true of the herons breeding in the tropical parts of Florida and Texas. All herons breeding farther north are at least partially migratory, for although a few individuals may remain through the winter in the vicinity of the nesting site,

yet the great majority retire at this season to more genial climes. Those breeding north of the Gulf States are almost completely migratory, though occasionally a bittern, a great blue heron, or a black-crowned night heron elects to spend the winter where large swamps or warm springs offer a precarious livelihood far north of the freezing line.

The most striking peculiarity of the migrations of the herons is their northward movement in the fall. Though not universal, yet it is a common habit for the young herons to wander in the late summer and early fall long distances, even several hundred miles, north of the district where they were hatched. They remain from a week to a month at their picnic grounds and finally depart for their winter home.

A still more remarkable migration habit is that of the snowy egret. Numbers of these birds migrate in the spring far north of the breeding range and remain throughout the summer in these northern districts as nonbreeders. The birds are, of course, adults, and sometimes they are found during the summer 500 to 1,000 miles north of the nearest known breeding grounds of the species. This habit of the snowy egret seems not to be shared by any other North American species.

The data in this bulletin on the distribution and breeding of the several species have been obtained largely from the printed records in ornithological literature. The extended migration tables are made possible by the reports of many hundred observers who have filled out migration schedules for the Biological Survey. Occasion is taken herewith to extend to these observers well-merited thanks for their painstaking care and for the large amount of time they have devoted to the study of bird movements.

NORTH AMERICAN HERONS AND THEIR ALLIES.

Flamingo. *Phoenicopterus ruber* Linnæus.

Range.—Florida, Yucatan, and the Bahamas, and southeast through the West Indies to Venezuela, the mouth of the Amazon, and the Galapagos; accidental in South Carolina and Louisiana.

Breeding range.—The flamingo is not a migrant in the ordinary sense of the word, and its occurrence outside of the breeding range is due to its wandering into contiguous regions in search of food. The species nested formerly among the keys of southern Florida in the vicinity of Indian Key (Audubon), and Cape Sable (Scott), but was driven away many years ago, and there seems to be no certain record of breeding in Florida during the past 20 years.

The principal breeding range seems to have been the Bahamas, which furnished in abundance the peculiar natural conditions required for the nesting site. Nests have been known throughout the Bahamas from Great Abaco (Allen), on the north to Great Inagua (Bryant), on the south, and as late as 1905 the birds were still nesting in considerable numbers on Andros Island (Riley). Large breeding colonies have existed in the vicinity of Cienfuegos, Cuba, and this port has been for many years one of the principal places of shipment for live flamingos. The flamingo is also known to have nested on the Isle of Pines (Gundlach); Rio Lagartos, Yucatan (Boucard); Bonaire Island, off the coast of Venezuela (Hartert); near the mouth of Waini Creek on the coast of British Guiana (Lloyd); on the coast of French Guiana near Cayenne (Waterton); and south to

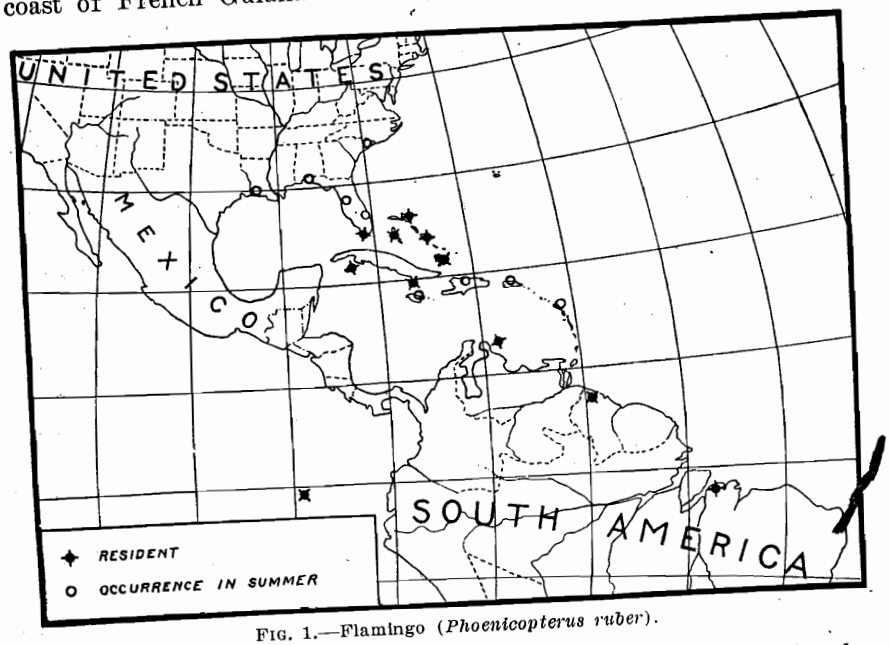

FIG. 1.—Flamingo (*Phoenicopterus ruber*).

the vicinity of the mouth of the Amazon River at Praia de Cajutuba, Brazil (Pelzeln), and to the Galapagos Islands (Beck).

Eggs have been found in the Bahamas, May 14, 1884 (Maynard); June 7, 1886 (Blake); and May 8, 1904 (Chapman); young out of the nest in the Bahamas, May 28, 1898 (Chapman); young on the Galapagos, April 1, 1902 (Beck).

Migration range.—Outside of the breeding season the flamingo used to be not uncommon on the west coast of Florida north to Tampa Bay (Scott), and a few probably still visit Florida, for they were noted at Upper Matecumbe Key, March 7, 1906 (Brodhead), and Lake Worth, May, 1905 (Ryman), but none probably winter anywhere in Florida. The flamingo has been noted also at Warrington, Fla. (Stone); Charleston, S. C. (Audubon); Georgetown, S. C., September, 1876 (Loomis); and at Cameron, La., December 6, 1910

(McAtee). One visited Bermuda September 24, 1849 (Hurdis), and the species has been recorded as a visitor to Jamaica (March), Haiti (Ritter), Porto Rico (Gundlach), Guadeloupe, Antigua, Anegada (Clark), Colombia (Masquera), and the Orinoco River in Venezuela (Burger).

Roseate Spoonbill. *Ajaia ajaja* (Linnæus).

Range.—Florida, Louisiana, Texas, and central Mexico, south to southern Patagonia; formerly north casually to South Carolina and Indiana; accidental in Pennsylvania, Wisconsin, Kansas, Colorado, and California.

Breeding range.—The roseate spoonbill as a breeder in the United States was confined to the extreme southern parts of Texas, Louisiana, and Florida. It has been known to nest in the lower Rio Grande Valley (Merrill); Grigsby, near Beaumont, Tex. (Rachford); Calcasieu (Kopman), Lake Arthur (Beyer), and Bayou Sara, La. (Beckham); and on the coast of southern Florida north to Indian River (Bryant) and Anclote Keys (Scott). Though sadly depleted in numbers and on the verge of extinction, yet the species probably still breeds near Cape Sable, Fla. (Bowdish), and Lake Arthur, La. (Beyer, Allison, and Kopman), while as late as July, 1910, a flock of about 50 was seen at the Indian Key Bird Reservation in Tampa Bay, Fla. (Pillsbury). Late records in Texas are at Rockport, August, 1905 (Howell) and at Brownsville June, 1907, and August, 1909 (Smith).

The pink curlew, as this bird is often called, has a wide distribution south of the United States. It is resident on both coasts of Mexico and on the large lakes of the interior, ranging on the Pacific Coast north to Mazatlan (Lawrence). It is known to breed in Nicaragua (Ridgway) and Costa Rica (Nutting) and has been recorded as occurring in Guatemala (Goss), Panama (Sharpe), and Colombia (Robinson). It used to be a common breeder in Great Inagua Island, Bahamas (Cory), in Cuba (Gundlach), and on the Isle of Pines (Poey), but is now rare if not extinct throughout this region. It has been recorded as a rare visitant to Jamaica (March), Haiti (Tristram), Porto Rico (Bowdish), and several of the Lesser Antilles including Trinidad Island (Leotaud), while from the coast of Venezuela (Ernst) south to Bahia Blanca, Argentina (Barrows) and to Santiago, Chile (Philippi), it is not rare either on the coast or in the interior on the larger rivers. A few have wandered south to the Falkland Islands (Abbott) and the Strait of Magellan (Sclater and Hudson).

The breeding season is evidently exceedingly variable and greatly extended. The National Museum contains eggs taken near Key

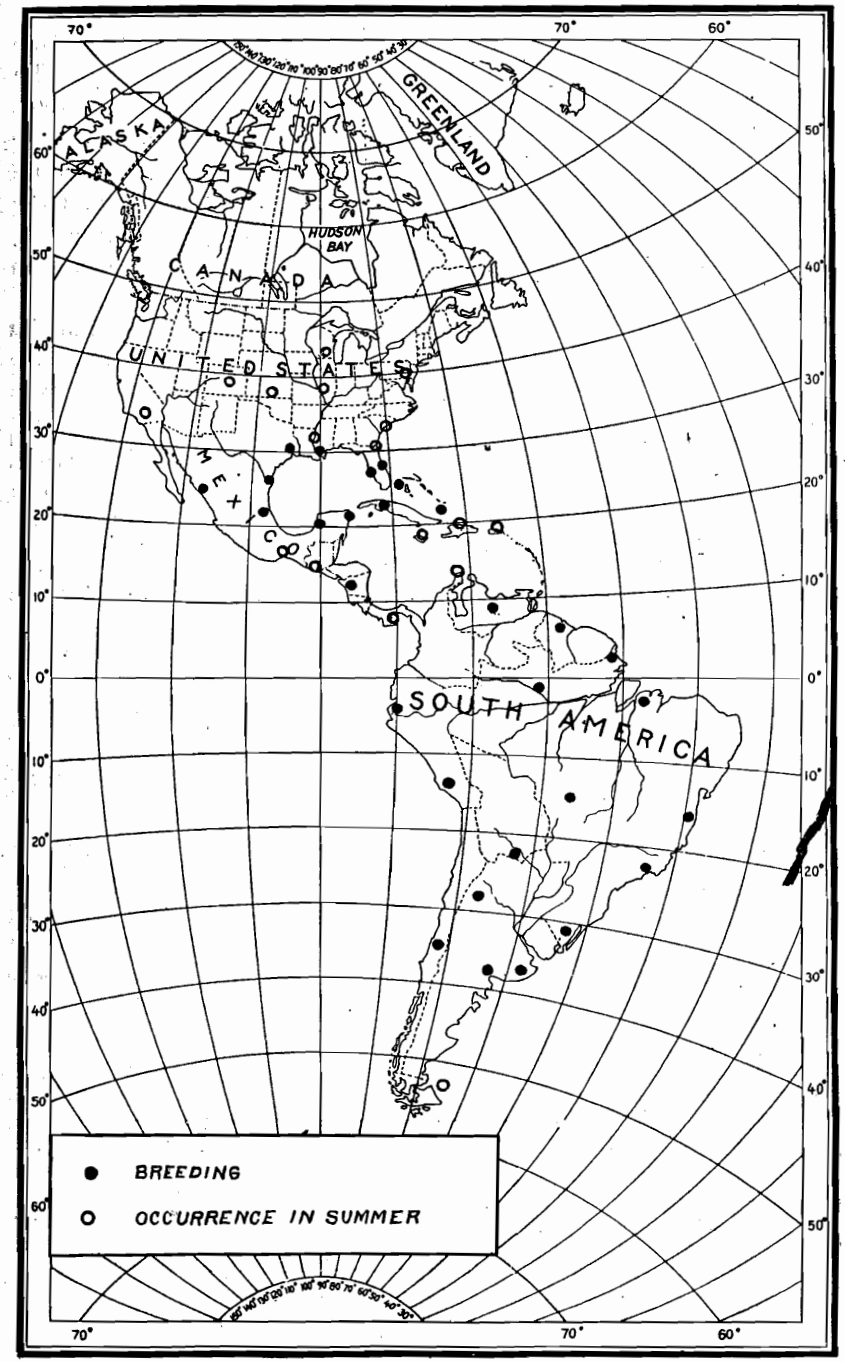

FIG. 2.—Roseate spoonbill (*Ajaia ajaja*).

West, Fla., January 16, 1886, and at Lake Okeechobee, Fla., March 14, 1874. Young nearly fledged were found April 1, 1858, on Indian River, Fla. (Bryant), and young in the nest April 19, 1882, at La Palma, Costa Rica (Nutting); both eggs and young May 1, 1903, at Cuthbert Lake, Fla. (Bent and Job) and fresh eggs at the same place March 29, 1908 (Chapman); eggs in June, Inagua, Bahamas (Cory); eggs June 2, 1886, Grigsby Bluff, Tex. (Rachford); fresh eggs in Cuba in early August, and both eggs and young at intervals throughout the fall, until finally young were found in the nest in December (Gundlach).

Migration range.—The roseate spoonbill is resident throughout its breeding range, but wanderers have been taken or noted at Cumberland, Ga., April 13, 1902 (Helme); Charleston, S. C., June, 1879 (Wayne); Yemassee, S. C., fall of 1885 (Wayne); Lancaster, Pa., (Warren); Rodney, Miss., June 27, 1889 (Mabbett); Vincennes, Ind., spring of 1856 (Butler); Portland, Ind., July 14, 1889 (Butler); Janesville, Wis., August, 1845 (Kumlein); near Wichita, Kans., March 20, 1899 (Matthews); Silverton, Colo., spring of 1888 (Morrison); near Pueblo, Colo., August, 1890 (Smith); San Bernardino, Cal., June 20, 1903 (Stephens).

White Ibis. *Guara alba* (Linnæus).

Range.—The Gulf States and central Mexico, south through Central America and the Greater Antilles to Venezuela and Peru; casual north to Vermont, Illinois, South Dakota, Colorado, and Utah.

Breeding range.—Throughout Florida the white ibis has been one of the most abundant breeding birds, and it has suffered so little at the hands of the plume hunters that it is still common in many parts of the State and in some places is really abundant. At Cuthbert and Alligator Lakes, near Cape Sable, Fla., two breeding colonies of more than a thousand birds each were found in 1903, and still larger ones reported farther inland (Bent). A colony of 4,000 nests was found in 1911 at Orange Lake, Fla. (Pearson). The species becomes less common to the northward, but has been known to nest north to St. Marys, Ga. (Arnow), southern South Carolina (Wayne), and Chipley, Fla. (Pleas). Though not so common west of Florida, yet it is not a rare breeder in southern Mississippi (Allison), southern and southwestern Louisiana (Beyer), and north to Natchez, Miss. (Audubon). It is less common on the Texas coast, breeding at Corpus Christi (Sennett) and Brownsville (Merrill), and occurs thence along the coast of eastern Mexico, on the larger inland lakes, and on the Pacific coast north to Mazatlan (Lawrence) and to Santa Margarita Island (Anthony). Though formerly abundant and still common in Cuba (Gundlach) and Isle of Pines (Bangs and Zappey), it seems not to have been common in the rest of its range in the West

Indies, though recorded from Jamaica (Field), Haiti (Christi), and Dominica (Clark). It occurs locally and not rarely along the whole Pacific coast of Central America south to the Rio Sabana, Panama (Salvadori and Festa), and has been recorded at the following places in northern South America: Zulia and Lake Valencia, Venezuela (Ernst); Vaqueria, northwestern Ecuador (Hartert); and Santa Luzia, northwestern Peru (Taczanowski).

Eggs have been taken March 28, 1898, at Lake Okechobee, Fla. (specimens in Thayer collection); April 24, 1888, at Tarpon Springs,

FIG. 3.—White ibis (*Guara alba*).

Fla. (Scott); fresh eggs, May 1, 1903, at Cuthbert Lake, Fla.; and young able to fly, May 15, 1903, at Alligator Lake, only a few miles distant (Bent). In Cuba these birds are said to nest from April to September.

Winter range.—The white ibis is resident throughout its range in Central and South America and the West Indies. It winters in the United States north to Gainesville, Fla. (Chapman), and to southern Louisiana (Beyer, Allison, and Kopman), and in western Mexico north to La Barca (Goldman), Mazatlan (Lawrence), and to La Paz (Belding).

Spring migration.—A slight northward migration occurs in spring, bringing the birds to Whitfield, Fla., March 17, 1903 (Worthington); Pensacola, Fla., March 19, 1886 (Evermann); St. Marys, Ga., March 17, 1904 (Arnow). Beyond this they have been taken as wanderers at Beaufort, N. C., July 26, 1908 (Pearson); Philadelphia, Pa. (Warren); Great Egg Harbor, N. J., 1858 (Turnbull); Moriches and Raynor South, N. Y. (Giraud); Milford, Conn., May 23, 1875 (Merriam); South Woodstock, Vt., summer of 1878 (Tracy);

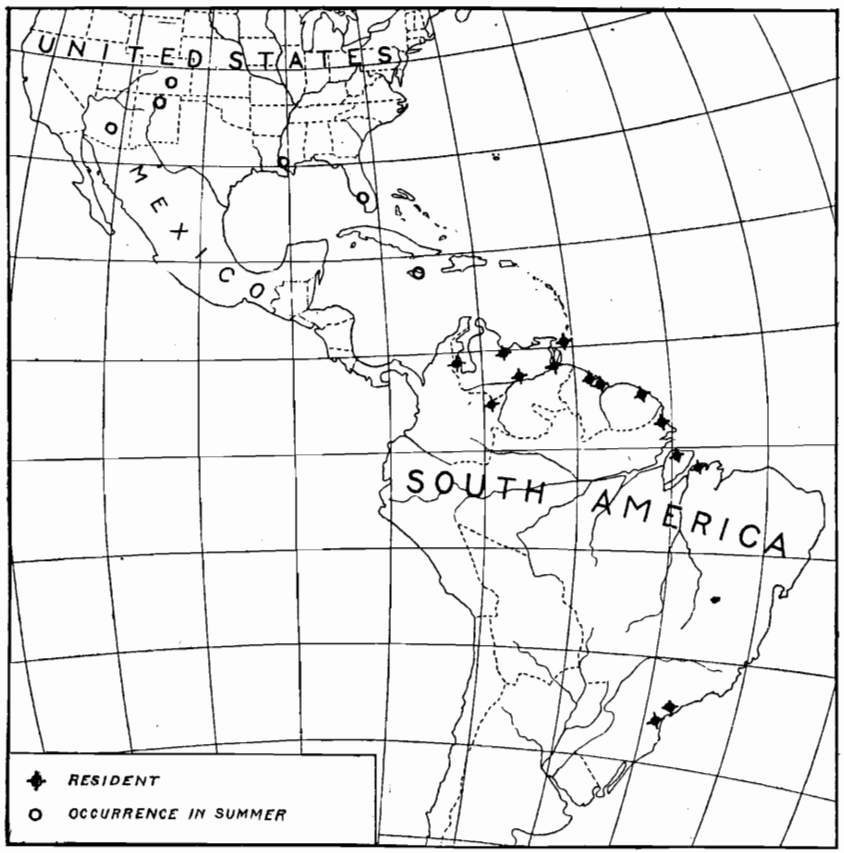

FIG. 4.—Scarlet ibis (*Guara rubra*).

Memphis, Tenn. (Audubon); Quincy, Ill. (Widmann); Mt. Carmel, Ill., May 8, 1878 (Ridgway); Vermilion, S. Dak., May, 1879 (Agersborg); Barr Lake, Colo., 1890 (Smith); Ogden, Utah, September, 1871 (Allen).

Scarlet Ibis. *Guara rubra* (Linnæus).

The range of the scarlet ibis is northern South America from eastern Colombia to the mouth of the Amazon; north casually to the United States.

The principal home of this bird is the northern coast of South America from Zulia, Venezuela (Ernst), and Trinidad Island (Leotaud) to the mouth of the Amazon (Allen). It penetrates the interior of Colombia to the Meta River (Burger), follows the Amazon up to the Rio Negro (Ihering), and goes south on the coast of Brazil to Iguape, Sao Paulo (Ihering). When Waterton visited South America in 1812, he found scarlet ibises in innumerable flocks along the coast of British Guiana near Georgetown and four years later found them equally abundant on the coast of French Guiana, both east and west of Cayenne. The brilliant coloring of the bird early drew to it the attention of the plumage hunter, and about 1895 its skins formed a not inconsiderable part of the $200,000 worth of plumage exported yearly from Para, Brazil (Goeldi). Though sadly depleted in numbers, yet it is still far from extinction, for as late as March, 1909, several hundred were in sight at once on the Waini River, British Guiana (Beebe).

The scarlet ibis is only a very rare straggler in the United States and the West Indies. The records north of South America are: Costa Rica (Zeledon); Jamaica previous to 1847 (Denny); Fort Ogden, Fla., May, 1888 (Scott); Bayou Sara, La., July 3, 1821 (Audubon); Los Pinos, N. Mex. (Coues); Fort Lowell, Ariz., September 17, 1890 (Brown); Grape Creek, Wet Mountain Valley, Colo. (Lowe). Linnæus based his name of this species on Catesby's plate and description of birds that were said to have come from the Bahamas, but since the scarlet ibis has no other record for the Bahamas, it is probable that Catesby was misled as to the origin of his birds and that they really came from South America.

Eggs were taken May 2, 1901, in Dutch Guiana (specimens in Thayer collection).

Glossy Ibis. *Plegadis autumnalis* (Linnæus).

The glossy ibis has a wide range in the tropical and subtropical regions of the Eastern Hemisphere, extending north to Spain, Hungary, Greece, Persia, Turkestan, and China, and south to southern Africa, Borneo, and Australia. A very small percentage of the species occurs in the Western Hemisphere, where it is found principally in Jamaica, Cuba, Florida, and Louisiana; casual north to Nova Scotia, Ontario, Wisconsin, Nebraska, and Colorado.

The status of this species in Florida is not well defined. Both this and the white-faced glossy ibis occur in Florida, breeding in close proximity, and they agree so closely in appearance that they can not be distinguished by sight at ordinary distances. Hence it is possible that some of the following records of the glossy ibis refer really to the white-faced species. The former is recorded from

Fort Myers, spring of 1886 (Scott); Caloosahatchee River, April 20, 1881 (specimen in U. S. National Museum); Orlando, nested 1909 (Hyer); Gainesville, nested 1910 (Baynard); Micanopy, nested (Baird, Brewer, and Ridgway); Tortugas, 1860 (specimen in U. S.

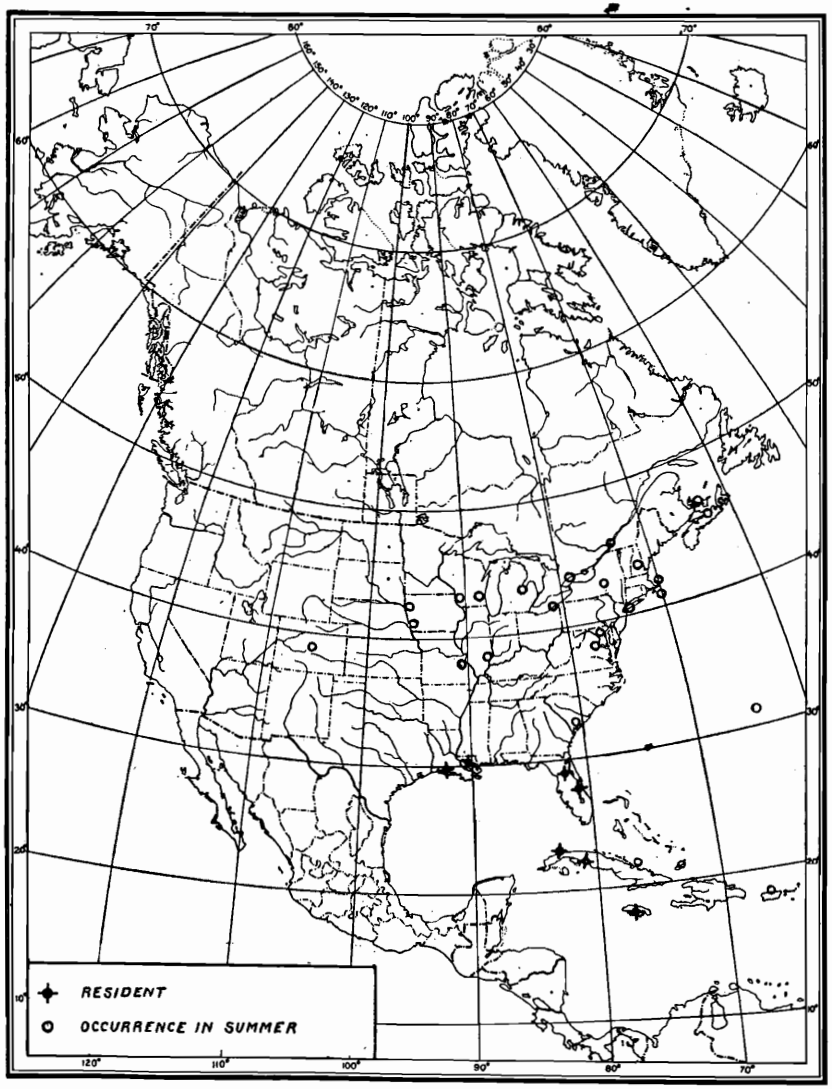

FIG. 5.—Glossy ibis (*Plegadis autumnalis*).

National Museum); Upper St. Johns, summer 1903 (Bent); near Cape Sable, summer 1903 (Bent); Orange Lake, Fla., eggs May 4–12, 1911 (Philipp).

The Louisiana records also are in an unsatisfactory condition. Apparently both species of glossy ibis occur at Lake Arthur and

both breed there, but their relative distribution in the rest of the State remains to be determined.

The glossy ibis is known locally as a wanderer along the whole Atlantic coast of the United States: Frogmore, S. C., June 30, 1884 (Hoxie); Washington, D. C., about 1817 (Audubon) and September, 1900 (Daniel); Baltimore, Md., May, 1817 (Audubon); Great Egg Harbor, N. J., May 7, 1817 (Ord); near Philadelphia, Pa., 1866 (Turnbull); 10 occurrences in New York State since 1844, between April and September, the latest being at Cayuga, May 21, 1907 (Fuertes); Middletown, Conn., May 9, 1850; near Cambridge, Mass., 5 birds, May 7 and 8, 1850 (Browne); Nantucket, Mass., September, 1869 (Allen); Cape Cod, Mass., May 4 and 5, 1878 (Allen); Alton, N. H., October, 1858 (Palmer); Pictou County, Nova Scotia, about 1865 (McKinlay); Prince Edward Island (Baird, Brewer, and Ridgway); Montreal, Canada, May 27, 1900 (specimen in Thayer collection). The species has been observed a few times inland: In Illinois, opposite St. Louis, February 27, 1880 (Hurter); Fairport, Ohio, 1848 (Wheaton); Bay City, Mich., October 6, 1884 (Eddy); Hamilton, Ontario, May, 1857 (McIlwraith); Horicon, Wis., November 3, 1879 (Kumlein and Hollister); Denver, Colo. (Cooke); Barr Lake, Colo., June, 1905 (Hersey and Rockwell). These last two records are far west of the normal range of the species and would be expected to be the white-faced glossy ibis, but there is no question of the correctness of the identification of the specimens.

The glossy ibis has been found as a rare breeder in western Cuba, at Zapata, Cardenas, and Habana (Gundlach), and was taken undoubtedly breeding at Spanishtown, Jamaica, May 16, 1865 (specimen in U. S. National Museum). One was taken February 22, 1900, at Cay Lobos Light, Bahamas (Bonhote), and one was seen in 1909 on Great Inagua, Bahamas (Worthington). There are rather uncertain records for four others of the West Indies.

White-faced Glossy Ibis. *Plegadis guarauna* (Linnæus).

The range of this bird is from central Mexico north to Louisiana, Utah, and Oregon; casual north to Minnesota, Wyoming, Idaho, and southern British Columbia; also in the southern half of South America; accidental in Costa Rica.

The white-faced glossy ibis is one of the few species of the heron tribe that are considered by law as game birds, and it is so considered in the United States in California only. Here it has an open season from October 15 to March 1, except in game district 6 (comprising the southern counties), where the season opens October 1. The bag limit is 20 birds in any one day and all sale within the State or shipment without the State is prohibited. The species is most common

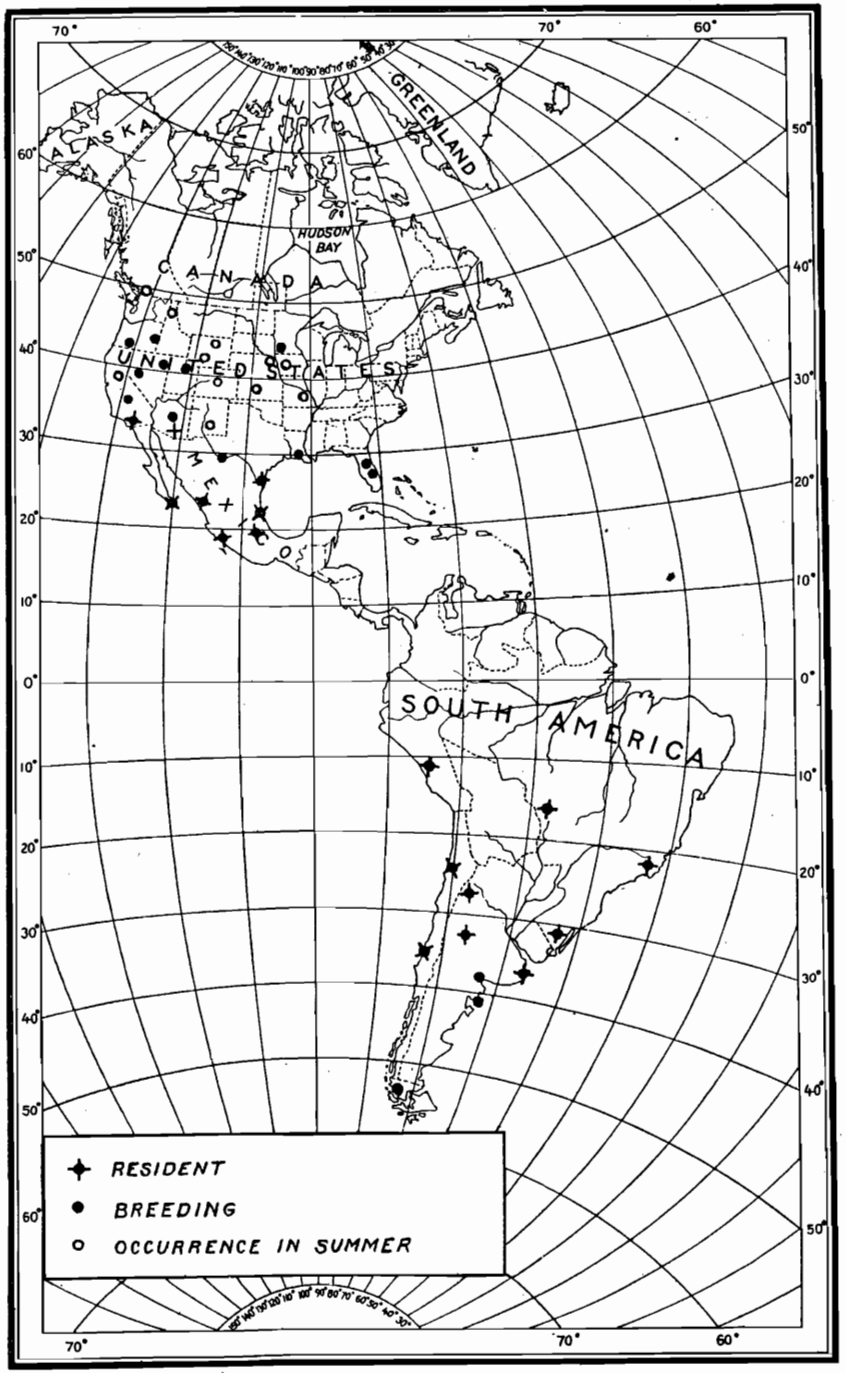

FIG. 6.—White-faced glossy ibis (*Plegadis guarauna*).

in the southern and central parts of the State, especially in the San Joaquin Valley.

In all but three of the other States where the white-faced glossy ibis occurs it is protected by law for the most part under the provisions of the general law that protects all but certain specified game birds. In Nevada, Kansas, and New Mexico, however, the species is not protected by law at any time in the year.

The habitat of the white-faced glossy ibis presents one of the best examples of a discontinuous range. The bird is apparently absent from the whole of Central America and from northern South America and the valley of the Amazon River. To the northward it ranges from latitude 18° to 44°, while south of the equator the range extends from 12° to 55°.

The white-faced glossy ibis breeds from the Valley of Toluca (Goldman), Manzanillo Bay (Lawrence), and San Jose del Cabo (Belding), Mexico; north to Great Salt Lake, Utah (Goodwin), and Malheur Lake, Oreg. (Finley). It also breeds along the coast of Texas, at Lake Arthur, La. (specimen in U. S. National Museum), and at Lake Washington, Fla. (Brewster). The species probably ranges regularly east to southwestern Louisiana, but, as already remarked under the last species, how common or regular it is in Florida remains yet to be determined. The species has wandered north to Rippey, Iowa, April, 1891 (Nutting); Spirit Lake, Iowa, May 15 to 21, 1890 (Mosher); Heron Lake, Minn., nested in 1894 and 1895 (Peabody); near Omaha, Nebr., August 19, 1893, and April 6, 1897 (Bruner, Wolcott, and Swenk); Red Bank, Wyo., 1893 (Knight); Lake Pend Oreille, Idaho, 1909 (Moody); Salt Spring Island and the mouth of the Fraser River in southwestern British Columbia (Fannin).

The white-faced glossy ibis winters throughout its range in Mexico and north to Brownsville, Tex. (Merrill); Gum Cove, La. (McAtee); Tombstone, Ariz. (Willard); and Los Angeles County, Cal. (Grinnell).

The breeding range in South America extends from near Callao, Peru (Cassin); and Rio Janeiro, Brazil (Sharpe); south to the Strait of Magellan (Dabbene); and the species is common on the larger rivers of the interior north to Ypanema, Brazil, on the Paraguay River at 16° south latitude (Pelzeln). It retires in the winter from the southern part of this breeding range, but remains at this season as far south as Cape San Antonio, Argentine (Gibson); and Santiago, Chile (specimen in U. S. National Museum).

The regular ranges in North America and South America are separated by 30° of latitude and 22° of longitude. There is only one record for the species in the whole 3,000 miles—a single bird, taken on the Diquis River in southwestern Cost Rica (Cherrie), which

had wandered about 1,200 miles from the nearest part of the bird's regular home.

Eggs are most commonly found in Argentina during November (Holland) and in Chile during November and December (Germain). North of the equator eggs have been taken at Lake Washington, Fla., April 18, 1886 (Brewster); Heron Lake, Minn., June 26, 1894, June 22 and July 2, 1895 (Peabody); Brownsville, Tex., May 16, 1877 (Merrill); Waco, Tex., April 22, 1900 (specimens in Thayer collection); San Diego, Cal., May 29, 1893 (Shields); Quinn River, Nev., May 11, 1881 (specimens in U. S. National Museum).

Wood Ibis. *Mycteria americana* Linnæus.

The range of the wood ibis is from the Gulf States and central Mexico south through Cuba and Central America to Argentina; casual north to New England, Ohio, Wisconsin, Montana, and California.

This bird is a tropical species of wide distribution in Central and South America. It is common in the United States only in Florida and along the Gulf coast to southern Texas. It breeds less commonly north to Colleton County, S. C. (Wayne); and to Rodney, Miss. (Mabbett); while in Mexico the breeding range extends north to Mazatlan and La Paz.

After the breeding season and when the young are fully grown both old and young are in the habit of moving northward to the swamps along the Mississippi River, particularly in southeastern Missouri and southern Illinois, which at this season of the year are swarming with their favorite food. Here they are common from July to September, while occasional flocks or individuals wander still farther and have been recorded at New Haven, Mo., August 11 to September 11, 1902 (Eimbeck); Brookville, Ind., August, 1855 (Evermann); Lyons, Ind., June 27, 1910, and June to September, 1911 (Van Gorder); Cleveland, Ohio (Jones); near Monroe, Mich., June 19, 1910 (Taverner); Racine, Wis., September, 1868 (Hoy); La Crosse, Wis., 1852 (Kumlein and Hollister); Ellis, Kans., March 26, 1885 (Goss); Waldron, Kans., June 29, 1908 (Matthews); Fort Thorn, N. Mex. (Henry); near Denver, Colo., August 30, 1902 (Felger); Ennis, Mont., October, 1902 (Cooley); Idaho City, Idaho, June 25, 1910 (Jewett).

The breeding birds of the coast of western Mexico also work northward in the fall, are especially common in the valley of the lower Colorado River, and are irregular visitants to southern California. They have been taken thence north to Fort Mohave, Ariz. (Coues); Rush Lake, Utah, October 1, 1872 (Yarrow and Henshaw); Nevada, July, 1871 (specimen in U. S. National Museum); and Hayward, Cal. (Grinnell).

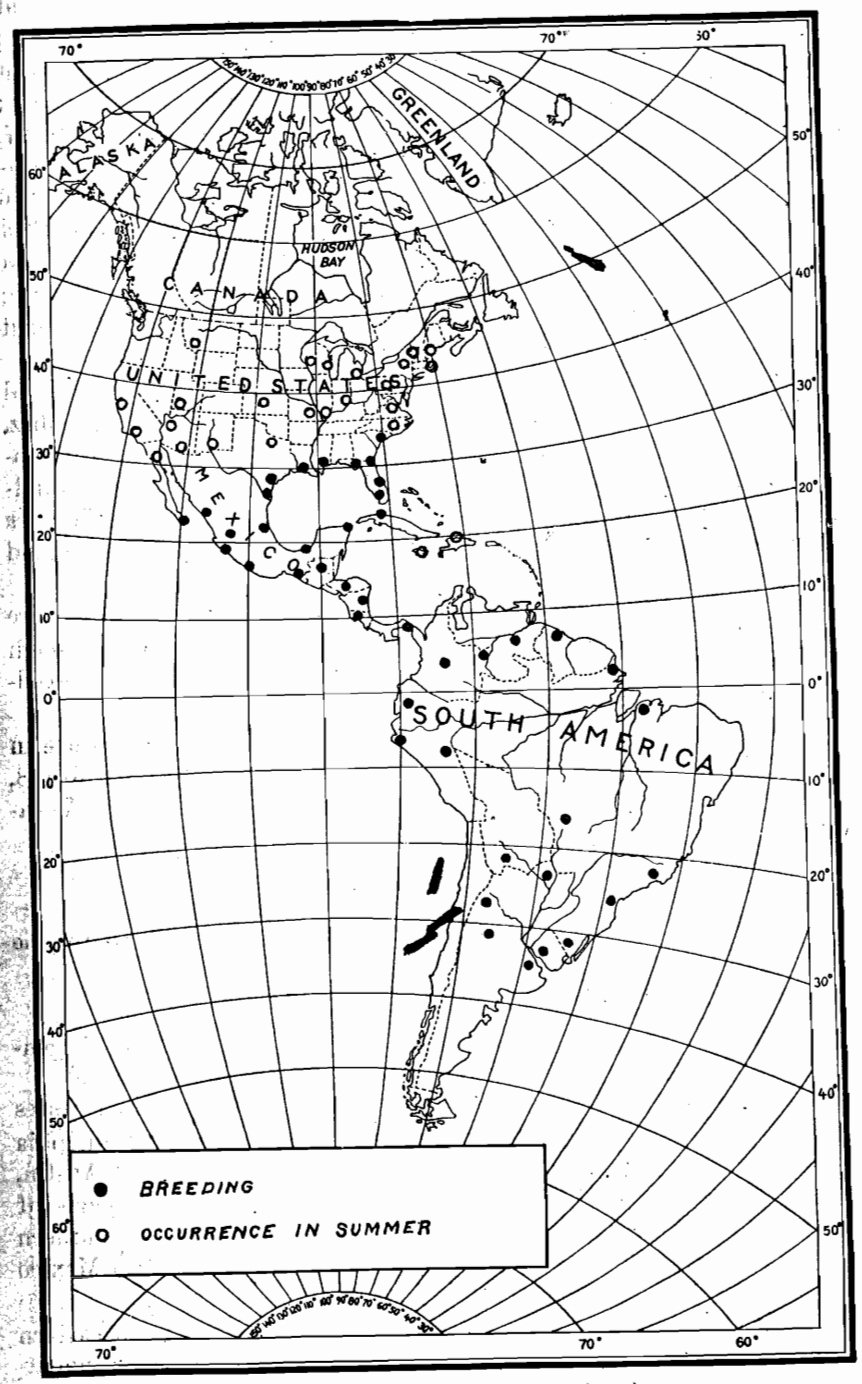

FIG. 7.—Wood ibis (*Mycteria americana*).

The wood ibis has been noted in the eastern United States at Raleigh, N. C., July, 1884 (Brimley); Morganton, N. C. (Wayne); Vinitaville, Va., July 18, 1896 (Palmer); Bloomery, W. Va., about July 28, 1884 (Wall); Washington, D. C., July 2, 1892 (Palmer); Silver Hill, Md., July 20, 1896 (Palmer); Laurel, Md., July 27, 1896 (Palmer); Williamsport, Pa., June 21, 1876 (Allen); Elizabethtown, Pa., July 10, 1884 (Sherratt); Troy, N. Y., June 24, 1876 (Allen); near Glasco, N. Y., July 8, 1884 (Fisher); near East Marion, N. Y., June 21, 1890 (Dutcher); Barrington, R. I., August 8, 1896 (Hathaway); Georgetown, Mass., June 19, 1880 (Allen); Seekonk, Mass., July 17, 1896 (Brewster); Williston, Vt., about 1897 (Perkins); and Berwick, Me., July 16, 1896 (Knight).

The wood ibis occurs in favorable localities throughout Central America, much of northern South America, and south to Tumbez, Peru (Taczanowski); Cordoba, Argentina (Dabbene); and Concepcion, Argentina (Barrows). It is a rare resident of Cuba (Gundlach); occasional in the Isle of Pines (Cory); accidental in Jamaica (Denny); rare in Haiti (Christi); and recorded from Trinidad Island (Leotaud).

The larger part of the most northern breeding wood ibises retire a few miles to the southward during the winter season, but enough remain to allow the species to be called resident throughout its breeding range.

This species is one of the earliest breeding birds, since eggs are in the United States National Museum taken in Florida, December 8, 1859; Cape Sable, Fla., January 5, 1892; and in southeastern Yucatan, March 15, 1890.

[**Cayenne Ibis.** *Harpiprion cayennensis* (Gmelin).

Ranges from southern Sao Paulo, Brazil, and Ecuador north and west to the Panama Canal.]

Jabiru. *Jabiru mycteria* (Lichtenstein).

The range of the jabiru is from Colombia and Guiana to Argentina; rare in Central America; accidental in Mexico and Texas.

The sole claim of the jabiru to a place in the list of United States birds rests on a specimen donated to the museum of the Philadelphia Academy of Sciences and claimed to have been taken near Austin, Tex. The species is a rather rare resident of the lower parts of Costa Rica and Nicaragua, and has been recorded once from southern Guatemala at Haumuchal (Salvin); and once from southern Mexico at Cosamaloapam (Sumichrast).

The jabiru seems not to have been reported as yet from eastern Costa Rica, Panama, or western Colombia, but it occurs from northeastern Colombia (Robinson); Venezuela (Ernst); Tobago Island (Jardine); and British Guiana (Cabanis); south throughout Brazil

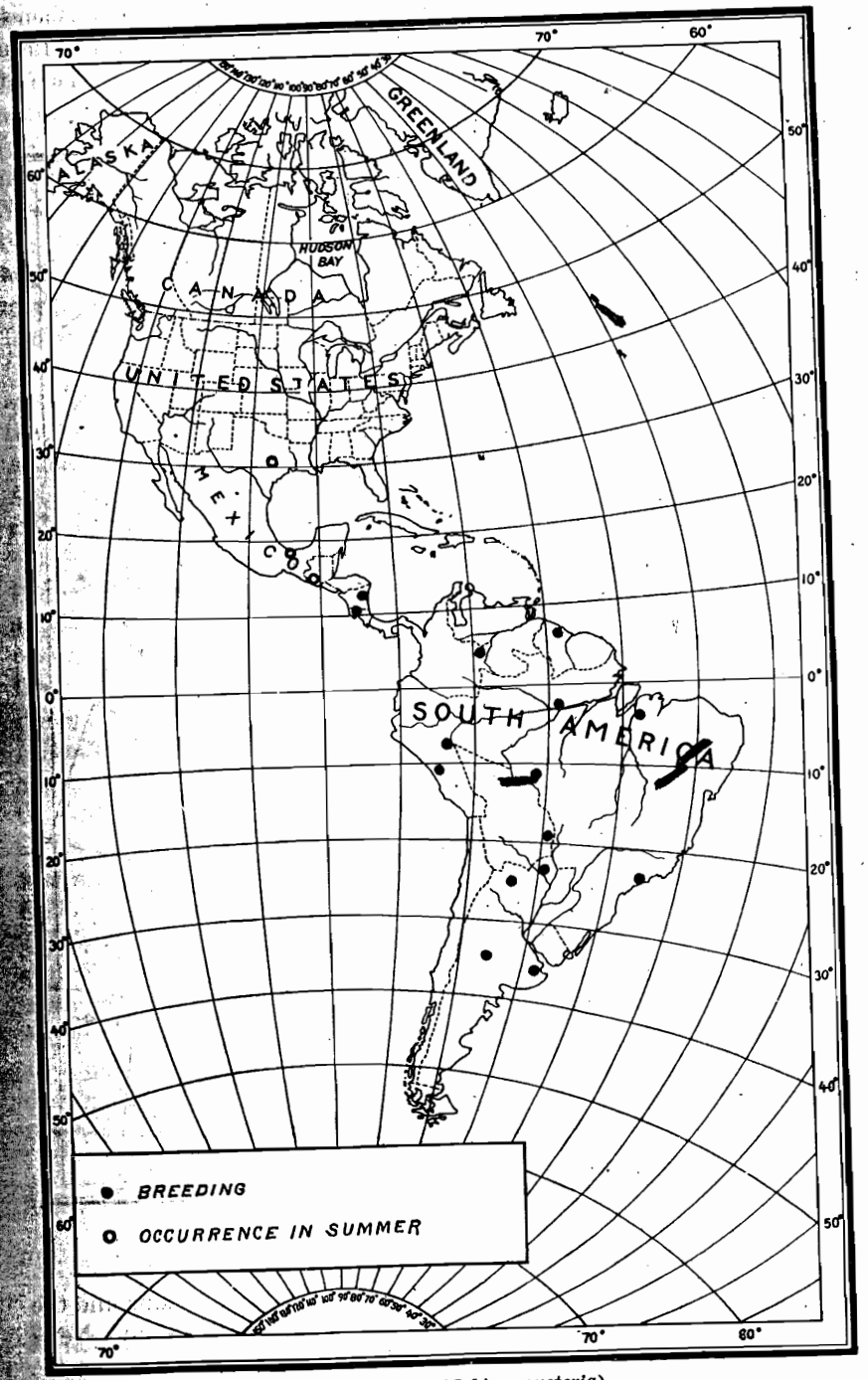

FIG. 8.—Jabiru (*Jabiru mycteria*).

and Paraguay to Cordoba, Argentina (Dabbene); and to Buenos Aires, Argentina (Hudson). It also ranges west to central Peru (Taczanowski). Eggs were taken October 10, 1904, on the Chaco of Argentina (Hartert and Venturi).

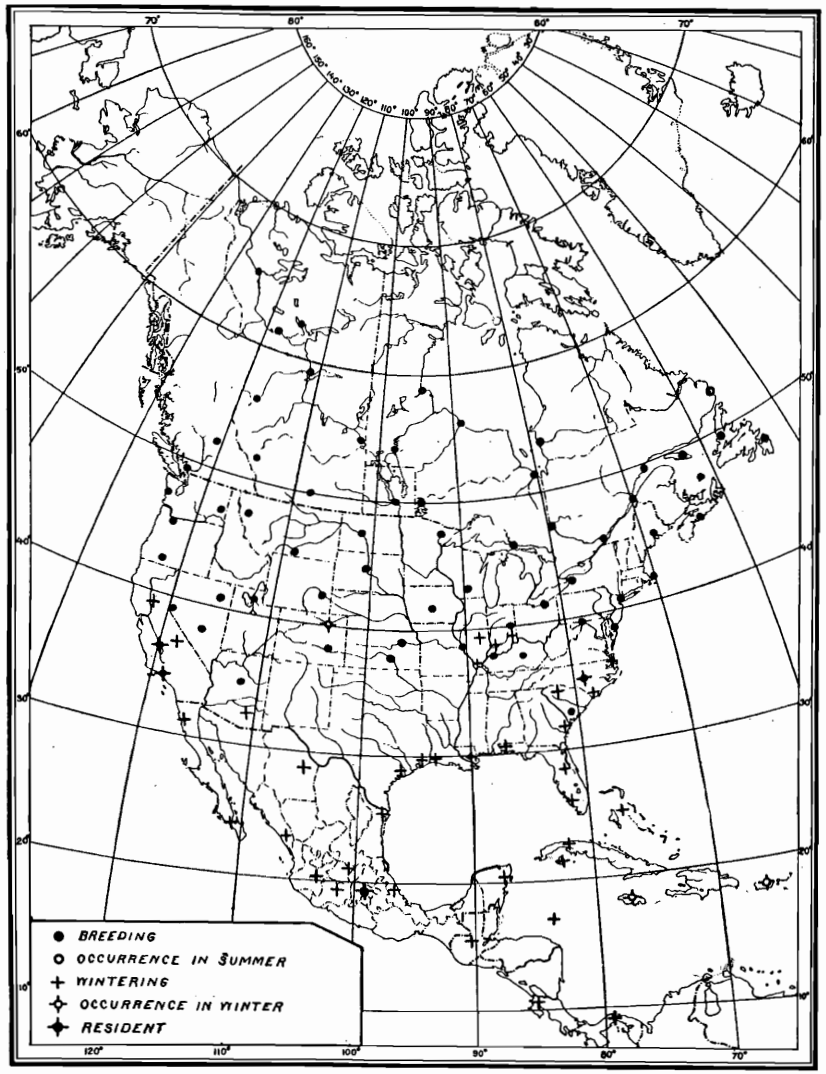

FIG. 9.—Bittern (*Botaurus lentiginosus*).

Bittern. *Botaurus lentiginosus* (Montagu).

Range.—Nearly the whole of North America, from Panama and the Greater Antilles north to British Columbia, Mackenzie, and Newfoundland.

Breeding range.—The bittern is one of the most northern breeding members of its family. During the summer it ranges north to

the southern part of the Cariboo District, B. C. (Brooks); Peace River Landing, Alberta (Macoun); Fort Norman, Mackenzie (Preble); Prince Albert, Saskatchewan (Ferry); Fort Churchill, Keewatin (Clarke); Fort George, on the east side of James Bay (Selwyn); Godbout, Quebec (Comeau); Anticosti Island, Quebec (Verrill); Humber River, Newfoundland (Porter); and St. John, Newfoundland (Howley). It was once seen at Cape St. Francis near the Strait of Belle Isle (Bigelow). The southern boundary of the normal breeding range extends from Buena Vista Lake, Cal. (Goldman); Pahranagat Valley, Nev. (Merriam), and Utah Lake, Utah (Johnson), east to Barr Lake, Colo. (Felger), Wichita, Kans. (Matthews), Henderson, Ky. (Alves); Variety Mills, Va. (Micklem), and Cape May, N. J. (Hand). South of this normal summer range, the species has been found breeding at Lerma, Mexico (Goldman); Alamitos, Los Angeles County, Cal. (Robertson); Mormon Lake, Ariz. (Mearns); Raleigh, N. C. (Brimley); and Yemassee, S. C. (Wayne).

Winter range.—The principal winter home is in the southern United States, from which a few pass south throughout Mexico and as far south as Coban, Guatemala (Salvin); Reventazon, Costa Rica (Bangs); Cariblanco and Turrucares, Costa Rica (Lankester); Laguna de Ochomogo, Costa Rica (Carriker); and Isthmus of Panama (Lawrence). The species is not rare in western Cuba (Gundlach), the Isle of Pines (Gundlach), and the northern Bahamas (Bonhote). It winters north to Marysville, Cal. (Belding), the lower Ohio Valley, and North Carolina; and is rare or casual at Canton, Ill. (Cobleigh), and Washington, D. C. (Coues). One was seen December 28, 1904, at a warm spring near Fort Morgan, Colo. (Felger), far north of the usual winter home.

Migration range.—Specimens have been taken in Jamaica (Denny) and Porto Rico (Gundlach), though the species is not known to occur regularly in either of these islands. Many individuals have found their way, spring and fall, to Bermuda (Jardine), though their appearance there is so irregular as to suggest accident rather than design. A straggler to Piddletown, England, became the basis of the original description of the species.

Spring migration.

Place.	Number of years' records.	Average date of spring arrival.	Earliest date of spring arrival.
Raleigh, N. C.	9	Apr. 1	Mar. 19, 1908
Pea Island, N. C.	2	Apr. 22	Feb. 11, 1901
Andrews, N. C.			Apr. 18, 1902
Weaverville, N. C.	3	Apr. 7	Apr. 12, 1891
Washington, D. C.			Mar. 22, 1894
Baltimore, Md.	5	Apr. 12	Mar. 31, 1898
Erie, Pa.	6	Apr. 10	Apr. 4, 1888
Renovo, Pa.			Mar. 29, 1907

Spring migration—Continued.

Place.	Number of years' records.	Average date of spring arrival.	Earliest date of spring arrival.
Northern New Jersey	3	Apr. 11	Mar. 27, 1909
Ithaca, N. Y.			Mar. 28, 1908
Canandaigua, N. Y. (near)	12	Apr. 22	Apr. 14, 1905
Jewett City, Conn. (near)	7	Apr. 21	Apr. 17, 1906
Beverly, Mass.	9	Apr. 20	Apr. 15, 1909
West Groton, Mass.	7	Apr. 22	Apr. 17, 1898
Monadnock, N. H.	2	Apr. 16	Apr. 14, 1905
Phillips, Me.	5	Apr. 25	Apr. 11, 1905
Pittsfield, Me.	3	May 8	May 4, 1895
Fort Kent, Me.			May 4, 1905
Montreal, Canada	5	Apr. 25	Apr. 20, 1908
Quebec, Canada	2	Apr. 27	Apr. 25, 1906
Pictou, N. S.	9	Apr. 22	Apr. 15, 1892
Halifax, N. S.	3	May 7	May 5, 1902
Blackville, N. B. (near)	3	May 11	May 7, 1906
North River, P. E. I.			May 20, 1888
Godbout, Quebec			May 12, 1895
Fayetteville, Ark.			Mar. 31, 1883
Monteer, Mo.			Mar. 26, 1904
Odin, Ill.	2	Apr. 5	Apr. 1, 1892
Canton, Ill.			Jan. 15, 1894
Vincennes, Ind.	2	Apr. 4	Apr. 3, 1888
Oberlin, Ohio	4	Apr. 10	Mar. 30, 1908
Detroit, Mich.	3	Mar. 31	Mar. 17, 1905
Vicksburg, Mich.	7	Apr. 7	Mar. 30, 1908
Point Pelee, Ont.			Jan. 25, 1907
Guelph, Ont.	4	Apr. 21	Apr. 13, 1895
Ottawa, Ont.	16	Apr. 24	Apr. 16, 1897
Tampico, Ill.	3	Apr. 10	Apr. 7, 1884
Chicago, Ill.	16	Apr. 19	Mar. 29, 1907
Ripon, Wis.			Apr. 12, 1879
La Crosse, Wis.	5	Apr. 22	Apr. 8, 1909
Palmer, Mich.	2	May 6	May 5, 1895
Central Iowa	12	Apr. 17	Apr. 4, 1890
Heron Lake, Minn.	6	Apr. 20	Apr. 8, 1889
Elk River, Minn.	4	Apr. 23	Apr. 9, 1887
Lake Andrew, Minn.	4	Apr. 24	Apr. 19, 1893
White Earth, Minn.			Apr. 17, 1880
Central Kansas	6	Apr. 17	Apr. 12, 1907
Kansas City, Mo.	4	Apr. 18	Apr. 17, 1902
Valentine, Nebr. (near)	4	Apr. 27	Apr. 21, 1896
Huron, S. Dak.	3	Apr. 17	Apr. 12, 1884
Sioux Falls, S. Dak.	2	Apr. 11	Apr. 10, 1910
Harrisburg, N. Dak. (near)	6	May 2	Apr. 22, 1883
Aweme, Manitoba	10	May 3	Apr. 19, 1909
Indian Head, Sask. (near)	6	May 11	May 1, 1910
Denver, Colo.	7	Apr. 20	Apr. 10, 1897
Salida, Colo.			Apr. 16, 1908
Utah Lake, Utah			Mar. 30, 1899
Terry, Mont.			Apr. 23, 1893
Edmonton, Alberta	4	May 21	May 14, 1908
Fort Providence, Mack.	2	May 9	May 6, 1904
Aumsville, Oreg.	4	Mar. 28	Mar. 21, 1889
Grays Harbor, Wash.			Apr. 3, 1890
Chilliwack, B. C.			Mar. 17, 1889
Okanagan Landing, B. C.	2	Apr. 26	Apr. 23, 1908

The last bittern seen in the spring at Nassau, Bahamas, was on March 6, 1902 (Bouhote); Frogmore, S. C., April 4, 1887 (Hoxie); New Orleans, La., April 7, 1904 (Allison); Whitfield, Fla., April 22, 1903 (Worthington).

Eggs have been taken at Variety Mills, Va., May 12, 1884 (Micklem); Salem, N. J., May 28, 1904 (Stone); Lake Umbagog, Me., June 4, 1883 (Carpenter); Magdalen Islands, Quebec, July 14, 1887 (Bishop); Kewanee, Ill., May 22, 1893 (Murchison); Fays Lake, Mich., May 30, 1894 (Watkins); Detroit, Mich., May 21, 1899 (Swales); Leech Lake, Minn., June 6, 1902 (Currier); Julesburg, Colo., May 17, 1899 (Dawson); Alamitos, Los Angeles County, Cal., May 14, 1899 (Robertson); Fort Crook, Cal., May 12, 1861 (specimens in U. S. National Museum); near Crane Lake, Saskatchewan, June 7, 1905 (Bent). Young out of the nest were found at Guelph, Ontario, at the early date of June 1, 1901 (Walker), and young a week old at Meridian, N. Y., May 31, 1898 (Tabor).

Fall migration.

Place.	Number of years' records.	Average date of the last one seen.	Latest date of the last one seen.
Chilliwack, B. C.			Dec. 19, 1889
Indian Head, Sask.	2	Oct. 15	Oct. 16, 1907
Whitford Lake, Alberta			Oct. 29, 1909
Aweme, Manitoba	2	Oct. 10	Nov. 5, 1909
Marstonmoor, N. Dak.			Nov. 9, 1909
Sioux Falls, S. Dak.	2	Nov. 7	Nov. 20, 1910
Barr Lake, Colo.			Dec. 28, 1904
Nebraska City, Nebr.			Nov. 8, 1909
Delavan, Wis.	3	Oct. 13	Oct. 16, 1894
Chicago, Ill.	5	Oct. 16	Nov. 28, 1895
Ottawa, Ont.	16	Oct. 23	Nov. 2, 1896
Palmer, Mich.			Oct. 31, 1894
Vicksburg, Mich.	5	Nov.	Nov. 12, 1902
Keokuk, Iowa	4	Oct. 31	Nov. 9, 1903
Kansas City, Mo.			Nov. 23, 1904
Minerva, Ohio			Nov. 10, 1892
Greensburg, Ind.			Dec. 25, 1892
North River, P. E. I.			Sept. 13, 1887
Montreal, Canada	6	Oct. 22	Nov. 11, 1894
Scotch Lake, N. B.			Nov. 22, 1900
Pictou, N. S.			Oct. 20, 1894
Pittsfield, Me.	3	Oct. 6	Oct. 9, 1895
Nantucket Island, Mass.			Nov. 3, 1896
Canandaigua, N. Y.			Oct. 30, 1905
Renovo, Pa.	3	Oct. 21	Nov. 11, 1900
Erie, Pa.	3	Oct. 24	Oct. 28, 1893
Cape May, N. J.			Nov. 19, 1878
Chester County, Pa.			Dec. 8, 1879

The first in fall migration arrived at Frogmore, S. C., August 26, 1886 (Hoxie), and at St. Marys, Ga., September 12, 1905 (Arnow).

[**Pinnated Heron.** *Botaurus pinnatus* (Wagler).

This species ranges in South America, in Argentina, Brazil, and Guiana, and has one somewhat doubtful record for Nicaragua (Lawrence).]

Least Bittern. *Ixobrychus exilis* (Gmelin).

Range.—North America north to Oregon, Saskatchewan, and New Brunswick, and thence south in winter to Chile and southern Brazil.

Breeding range.—The least bittern is a regular and common breeder in the eastern United States north of latitude 39° and west of New England. The breeding range extends north to St. John, N. B. (Chamberlain); Ottawa, Ontario (White); Grand Rapids, Mich. (Milliken); Ripon, Wis. (Cooke); White Earth, Minn. (Cooke); Crane Lake, Saskatchewan (Macoun); and probably in southern Manitoba. Its western limit is near the hundredth meridian at Hays, Kans. (Lantz); Long Pine, Nebr. (Bates); and Roscoe, S. Dak. Throughout the Rocky Mountain region the species is absent as a breeder, but appears again in small numbers along the Pacific coast at San Luis Rey, Cal. (Sharp); Los Angeles, Cal. (Grinnell); and

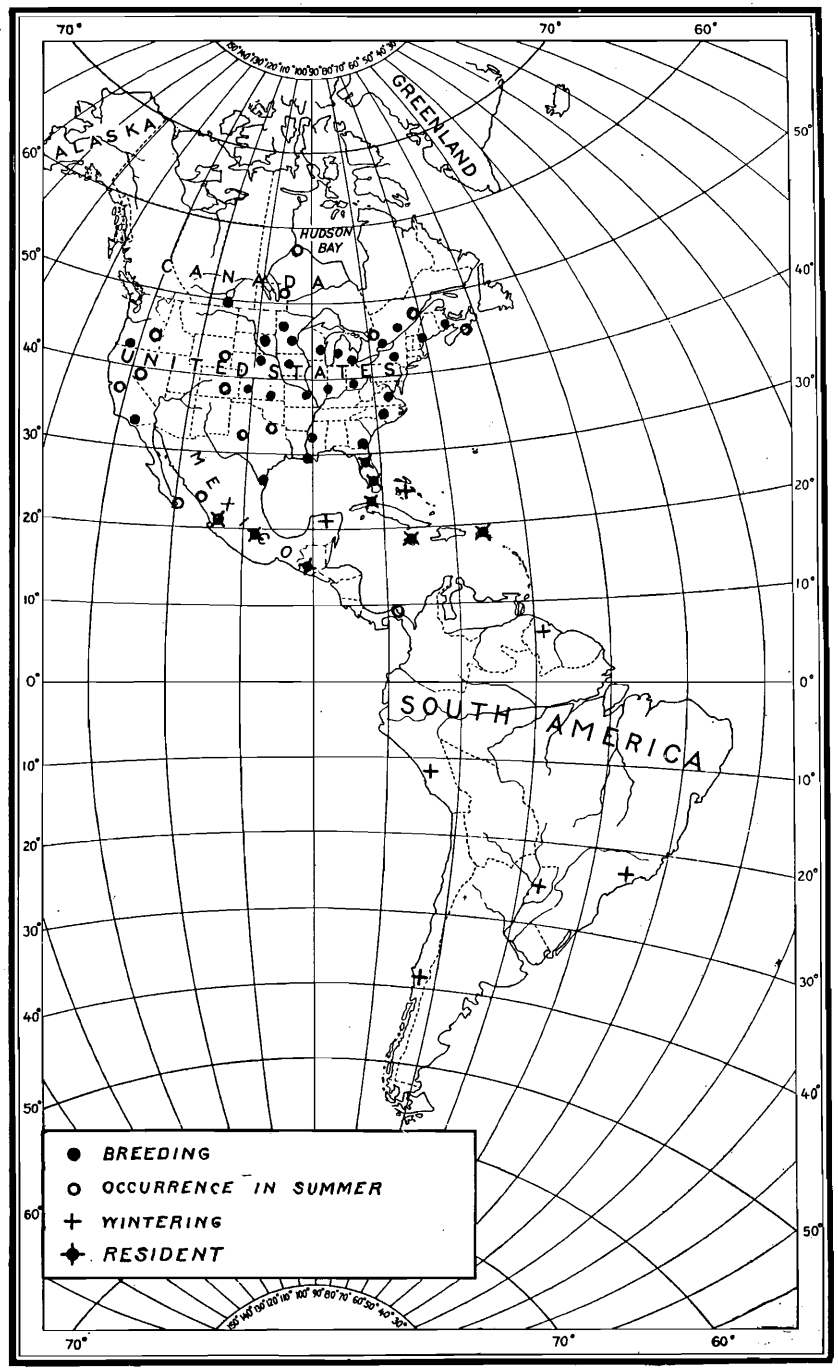

FIG. 10.—Least bittern (*Ixobrychus exilis*).

Tule Lake, Oreg. (Bailey). It breeds rarely along the Atlantic coast from Washington, D. C. (Coues), to Raleigh, N. C. (Brimley), and Lake Ellis, N. C. (Philipp), and more commonly on the coast of South Carolina (Wayne), in Georgia (Perry), throughout most of Florida, and along the Gulf coast to the mouth of the Rio Grande (Merrill). There is thus a large part of the eastern United States south of the thirty-ninth parallel and back from the coast in which the species is either lacking or very rare.

The least bittern nests locally in a few places in central Mexico—Ocotlan, Jalisco (Nelson); La Laguna, Jalisco (Nelson); Patzcuaro, Michoacan (Stone); and the valley of Toluca (Goldman). It breeds also in Cuba (Gundlach); and Porto Rico (Gundlach).

Winter range.—The least bittern winters north to Micanopy, Fla. (Baynard); and Orlando, Fla. (Hyer); also in the Bahamas (Bonhote). In Mexico it occurs in winter north to San Blas, Tepic (Lawrence); Lake Patzcuaro, Michoacan (Jouy); and the valley of Toluca (Goldman). Thence it ranges south to Lion Hill, Panama (Sharpe); Georgetown, Guiana (Loat); Iguape, Brazil (Ihering); Paraguay (Berlepsch and Stolzmann); and to Valdivia, Chile (Boeck).

Migration range.—Records of migration or of wandering have been made at Halifax, N. S., March 16, 1896 (Piers); Quebec City, Canada (Dionne); Beaumaris, Ontario (Fleming); Shoal Lake, Manitoba, June, 1901 (Chapman); San Angelo, Tex., September 10, 1885 (Lloyd); Fort Thorn, N. Mex. (Henry); Boulder, Colo., May 25, 1910 (Betts); Cheyenne, Wyo. (Knight); Truckee Valley, Nev. (Ridgway); Malheur Lake, Oreg. (Bendire); Mazatlan, Sinaloa, September (Lawrence); San Jose del Cabo, Lower California, common in the fall (Brewster).

Spring migration.

Place.	Number of years' records.	Average date of spring arrival.	Earliest date of spring arrival.
Savannah, Ga.			Mar. 6, 1908
Frogmore, S. C.			Apr. 5, 1888
Manteo, N. C.			Apr. 20, 1899
Raleigh, N. C.	2	May 5	May 3, 1889
Washington, D. C.	3	May 20	May 18, 1907
Erie, Pa.	5	May 23	May 19, 1892
Williamsport, Pa.			May 6, 1896
Brockport, N. Y.			May 5, 1894
Providence, R. I.			Feb. 28, 1881
Belmont, Mass.			May 11, 1876
Opelousas, La.			Apr. 13, 1837
Corpus Christi, Tex.			Apr. 5, 1889
Escondido, Cal.			Mar. 28, 1896
Quincy, Ill.	4	Apr. 27	Apr. 22, 1888
Turlington, Nebr.			May 6, 1900
Oberlin, Ohio.	6	May 1	Apr. 25, 1904
Waterloo, Ind.	3	May 3	Apr. 30, 1907
Chicago, Ill.	6	May 14	May 6, 1890
Southwestern Ontario.	8	May 16	May 13, 1905
White Earth, Minn.	2	May 11	May 10, 1881
Heron Lake, Minn.	4	May 18	May 9, 1889
Sioux Falls, S. Dak.			May 11, 1908

Eggs have been taken at Fort Thompson, Fla., March 25, 1893 (specimens in U. S. National Museum); Titusville, Fla., April 10, 1905 (Worthington); St. Johns, Fla., April 18, 1902 (Bent); Rodney, Miss., May 10, 1887 (Mabbett); Raleigh, N. C., May 23, 1893 (young in nest) (Brimley); Philadelphia, Pa., May 29, 1907 (Miller); Portland, Conn., June 10, 1883 (Neff); Oak Forest, Ind., May 21, 1902 (Honecker); Canton, Ill., May 28, 1884 (Cobleigh); Des Moines, Iowa, May 26, 1885 (Keyes); Detroit, Mich., May 26, 1891 (Wood); Fort Snelling, Minn., May 28, 1903 (specimens in U. S. National Museum); Mud Lake, Minn., June 3, 1887 (Brownell). Eggs have been found in Porto Rico on May 7 (Gundlach); in Jamaica from May 29 (Field) to June 25 (Scott); in Guatemala June 1 (Oates); and at Purissima, Lower California, May 17, 1909 (Thayer).

Fall migration.—The latest fall date of the least bittern at Montreal, Canada, was on September 2, 1897 (Wintle); Middletown, R. I., September 14, 1901 (King); Erie, Pa., September 25, 1902 (Todd); Washington, D. C., September 19, 1881 (Richmond); Waterloo, Ind., October 1, 1906 (Link); Vicksburg, Mich., October 5, 1903 (Corwin); Oberlin, Ohio, October 17, 1909 (Jones); Indianola, Iowa, October 18, 1902 (Jeffrey); Toronto, Ontario, November 28, 1894 (Fleming); Dunlap, Cal., September 24, 1890 (Eaton); Sioux Falls, S. Dak., October 8, 1911 (Larson); Lincoln, Nebr., September 20, 1900 (Wolcott); Corpus Christi, Tex., September 29, 1886 (Sennett); and Bermuda, October 23, 1847 (Hurdis).

The earliest fall record at Lima, Peru, was on October 10, 1889 (Berlepsch and Stolzmann).

Cory Least Bittern. *Ixobrychus neoxenus* (Cory).

The Cory least bittern has a strange distribution, judging from the little as yet learned about the species. It is known to breed at the northern limit of the range in Ontario and also at its southern limit in Florida. It is known as a migrant only in the intervening region and is not known in winter anywhere.

It has been found nesting near Toronto, Ontario, and near Fort Thompson, Fla.; at the former place eggs were found June 15, 1898 (Fleming), and at the latter, young in the nest, June 8, 1890 (Scott). Near Toronto about 16 specimens have been taken in the summer, the earliest date being May 14, 1897, and the latest September 9, 1899, and young birds have been found from August 3 to 17. One specimen has been secured at each of the following localities: Watkins Lake, Jackson County, Mich., August 8, 1894 (Watkins); St. Clair Flats, Mich., May 14, 1904 (Taverner); Toledo, Ohio, May 25, 1907 (Ruthven); Lake Koshkonong, Wis., May 22, 1893 (Cherrie); and Scituate, Mass., May 18, 1901 (Brewster). The above are probably all the records that have been published for this species north of Florida.

The records in this latter State come from a restricted area in the vicinity of the western side of Lake Okechobee and extend over the three summer months from May 19, 1890, to August 15, 1891. A number of specimens have been taken, showing that the bird is not rare in that region, but so far there are no winter records for the species anywhere, and nothing to indicate where the birds spend the time from September to May.

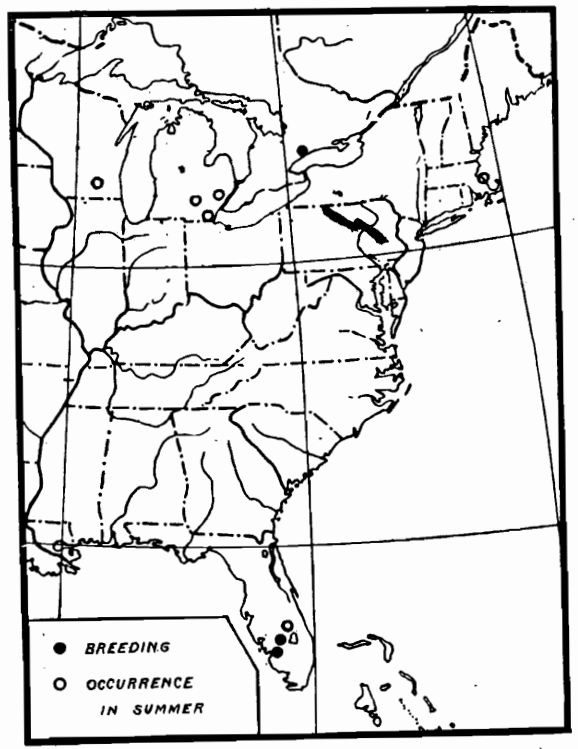

FIG. 11.—Cory least bittern (*Ixobrychus neoxenus*).

Great White Heron. *Ardea occidentalis* Audubon.

The great white heron has the most restricted range of any of the herons of North America. It is confined during the breeding season to the extreme southern part of Florida, where it has been known to nest from Indian Key (Audubon); west to Marquesas Key (Fowler); and north to Cape Romano (Scott). It is normally nonmigratory, but a few individuals have wandered north on the east coast of Florida to Brevard County (Chapman); in the interior to Cypress Lake (Palmer); and on the west coast to Anclote River (Scott). South of the United States it has been taken on the Rio Lagartos, Yucatan (Brown), in Jamaica (March), and near Trinidad, Cuba (Chapman). Eggs have been taken on the Florida Keys from October (Scott) all through the winter and spring to the middle of June (Thayer).

Great Blue Heron. *Ardea herodias herodias* Linnæus.

Range.—The great blue heron with its several subspecies ranges from ocean to ocean and north to southern Canada and southern

Alaska. It occurs throughout Mexico, Central America, Bermuda, the Bahamas, and the West Indies, while a few birds have been recorded from northern South America and from the Galapagos Islands.

Breeding range.—The typical form *herodias* breeds north to Baddeck, N. S. (Dwight); Magdalen Islands, Quebec (Job); Chatham, N. B. (Baxter); Quebec City, Canada (Dionne); Cobalt, Ontario (Hubel); Riding Mountain, Manitoba (Seton); Osler, Saskatchewan (Colt); and Spotted Lake, Alberta (Loring). It has been known to occur north to Anticosti (Schmitt); Godbout, Quebec (Comeau); Moose Factory, Ontario (Turner); and Fort Chimo, Quebec (Turner). It breeds south on the Atlantic coast to Mount Pleasant, S. C.

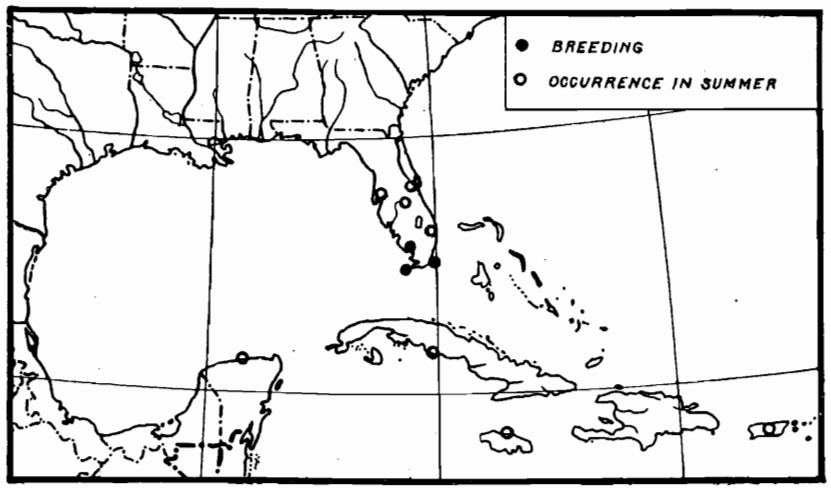

FIG. 12.—Great white heron (*Ardea accidentalis*).

(Wayne), and south in the Mississippi Valley to Winnebago County, Iowa (Abbott). It occurs west in migration to Prospect Lake, B. C. (specimen in American Museum of Natural History), and probably breeds in southeastern British Columbia.

The species once nested in Bermuda in 1846 (Wedderburn), but has since then been known there as a migrant only.

Winter range.—The regular winter range of typical *herodias* extends south to Micco, Fla. (Bangs); Castleberry, Ala. (Matthews); and to Camargo, Tamaulipas (Goldman). The species ranges north in winter to Raleigh, N. C. (Brimley); Cape Charles, Va. (Chapman); and to Fayetteville, Ark. (Harvey). In mild winters some individuals remain much farther north, as far as the lower Ohio Valley (Butler) and New Jersey (Fisher), while stragglers have been noted at Randolph, N. H., December 31, 1910 (Allen); Milton, Vt., December 22, 1884 (Howe); Boston Harbor, Mass., January 1,

1882 (Job); West Roxbury, Mass., January 1, 1890 (Faxon); Point Judith, R. I., December 11, 1899 (Hathaway); Bridgeport, Conn.,

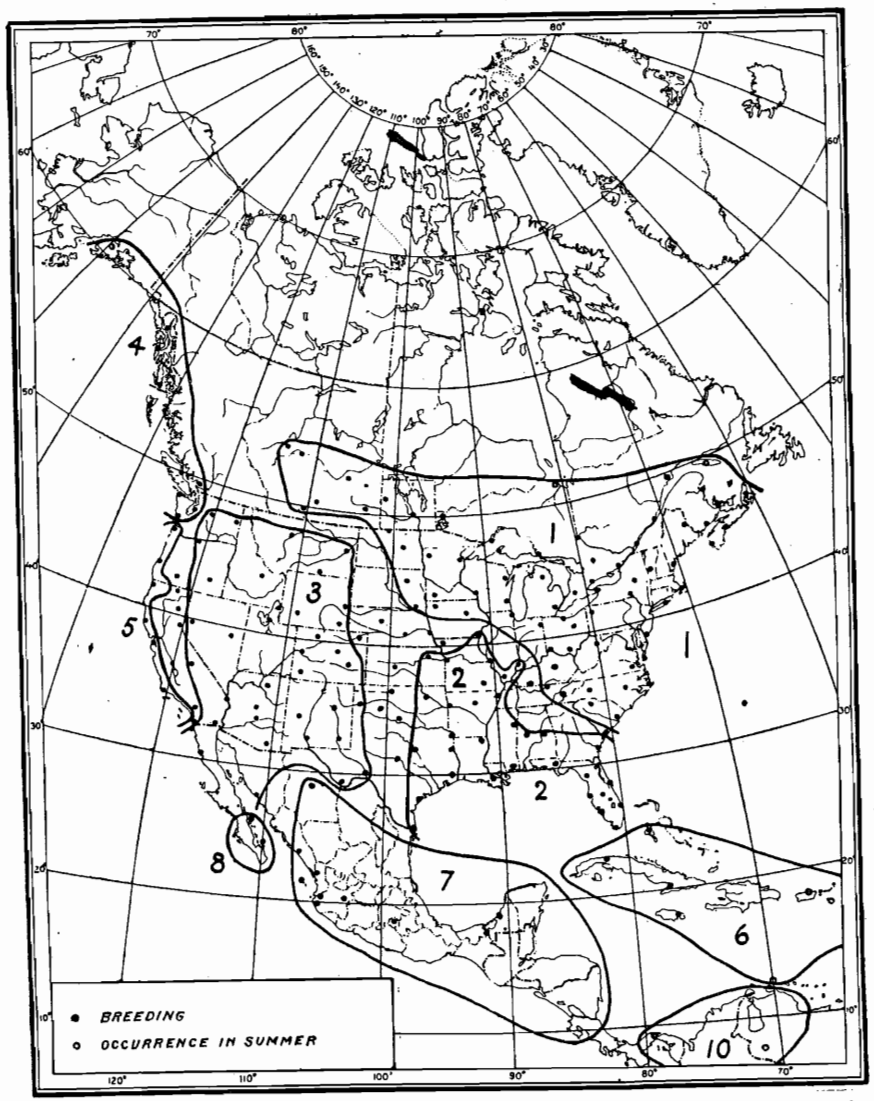

FIG. 13.—Great blue heron (*Ardea herodias*). Subspecies: 1, *herodias;* 2, *wardi;* 3, *treganzai;* 4, *fannini;* 5, *hyperonca;* 6, *adoxa;* 7, *lessoni;* 8, *sanctilucae;* 9, *cognata* (Galapagos, not shown on map); 10, South American birds not yet determined or named.

January 1884 (Foster); Madison County, N. Y., January 12, 1900, and December 27, 1900 (Embody); Frankfort, Ind., January 14, 1903 (Ghere); Lansing, Mich., December 23, 1897 (Hawkinson).

Ward Heron. *Ardea herodias wardi* Ridgway.

The form of the great blue heron breeding in Florida has received the name of *wardi*. It includes not only all the Florida breeding birds, but also those breeding on the Atlantic coast north to Hiltonhead, Beaufort County, S. C. (Prentiss); along the Gulf coast to Corpus Christi, Tex. (Sennett); and up the middle of the Mississippi Valley to Knox County in southwestern Indiana (Ridgway); and Henry County in southeastern Iowa (Savage).

This form is resident throughout its range with the exception of those individuals that migrate up the Mississippi Valley. These retire in the fall to spend the winter on the Gulf coast. A specimen taken December 25, 1902, at Ocotlan, Jalisco (Nelson and Goldman), apparently represents a bird that had wandered far from its normal range.

Treganza Heron. *Ardea herodias treganzai* Court.

The large, dark, great blue herons of the Mississippi Valley are cut off from those of the Pacific by a small pale form occupying the Great Basin and the semiarid regions to the eastward. This form has been separated under the name of *treganzai*, and birds of this character breed north at least to Douglas, Wyo. (Dwight); Gallatin, Mont. (Richmond); and Grace, southeastern Idaho (Walcott); and south to the Salton Sea, Cal. (Grinnell).

During migration it spreads westward into California to the Sacramento Valley (Williamson).

It ranges south in winter to the lower Rio Grande Valley of Texas (Dwight); and in northern Mexico south to Colima (Nelson and Goldman); while it remains in winter north to Fort Clark, Tex. (Mearns); Dona Ana, N. Mex. (Henry); and St. George, Utah (Bailey).

Northwestern Coast Heron. *Ardea herodias fannini* Chapman.

As its name implies, the northwestern coast heron is confined to the Pacific coast. It is known to breed north to Glacier Bay, Alaska (Grinnell), and it probably breeds still farther north, for it was seen occasionally during the summer of 1906 near Yakutat Bay (Blackwelder); and at Hope, Cook Inlet, during August, 1900 (Heller). This form breeds south to Cape Flattery, Wash. (Trowbridge); and to Nisqually Flats near Tacoma, Wash. (Rhoads).

Alaska is deserted in winter, and most of the individuals spend this season in the vicinity of Puget Sound north to Chilliwack, B. C. (Brooks).

California Great Blue Heron. *Ardea herodias hyperonca* Oberholser.

The great blue herons of the Pacific coast from Oregon to southern California have lately been segregated by Oberholser under the name of *hyperonca*. A specimen from Oregon (Peale) without any definite locality indicates the probability that the coast-breeding birds of that State should be assigned to this form, and thence it extends south to San Diego, Cal. (Cooper). How far back from the coast this form ranges, and to which form should be assigned the great blue herons of the interior valleys of California are points not yet decided.

West Indian Great Blue Heron. *Ardea herodias adoxa* Oberholser.

According to Oberholser, who has recently described this form, this subspecies includes all the breeding birds of the entire Greater and Lesser Antilles, with the addition of the Bahamas on the north and Curaçao Island off the coast of Venezuela on the south. A strange fact in the life history of this form is that it is a pronounced migrant. It is known in the winter season as a not rare visitant to the whole Lesser Antilles, but is not known to breed on any of them, nor is it probable that it breeds on either Porto Rico or Haiti. While fairly common in winter on many of the Bahamas, it has not yet been found breeding on any of them, though birds have been noted at what might have been and probably was the breeding season. The species is recorded as more common in Jamaica during the winter than in summer, hence no great numbers probably leave this island.

The status of the birds of the Isle of Pines and of Cuba, in which latter country it is a common breeder, remains entirely unsettled, nor is it known whether they belong to this new form or to *wardi*. The most that can be said at present is that the great blue heron is a winter resident in Haiti, Porto Rico, and the Lesser Antilles south to the islands of Trinidad and Curaçao, but that there is nothing certain known as yet concerning the summer home of these individuals.

Mexican Great Blue Heron. *Ardea herodias lessoni* Wagler.

Many years ago the great blue herons of the mainland of Mexico were named as above and these birds breed in favorable localities over much of Mexico south to Guerrero and east to Campeche. They occur as migrants and winter residents throughout the whole of Central America to central Costa Rica.

The status of the great blue herons of northwestern South America is not yet settled, but the bird occurs in the breeding season from

Merida, Venezuela, to the Canal Zone, Panama, and also winters in this region and on the islands off the north coast of Venezuela.

Lower California Great Blue Heron. *Ardea herodias sanctilucae* Thayer and Bangs.

The name *sanctilucae* applies to the birds of the Cape region of Lower California, where they have been found breeding on San Jose and Espiritu Santo Islands and wintering south to San Jose del Cabo.

Galapagos Great Blue Heron. *Ardea herodias cognata* Bangs.

Restricted to the Galapagos Islands, where it is a constant resident.

Migration and breeding of the Great Blue Heron and its subspecies.

The following records of migration and breeding are not separated according to subspecies, but it is easy to tell from the preceding statements of range which particular form is intended.

Spring migration.

Place.	Number of years' records.	Average date of spring arrival.	Earliest date of spring arrival.
Raleigh, N. C.	5	Apr. 2	Rare, winter.
Weaverville, N. C.	3	Apr. 6	Mar. 29, 1894
Lick Run, Va.	3	Apr. 1	Mar. 27, 1888
White Sulphur Springs, W. Va.	4	Apr. 6	Apr. 4, 1898
Washington, D. C.	6	Apr. 3	Jan. 21, 1912
Erie, Pa.	5	Apr. 5	Mar. 27, 1902
Renovo, Pa.	6	Apr. 15	Mar. 24, 1903
Morristown, N. J.	4	Apr. 9	Mar. 27, 1886
Branchport, N. Y.	12	Mar. 31	Mar. 24, 1899
Canandalgua, N. Y.	3	Mar. 25	Mar. 24, 1906
Bridgeport, Conn.	4	Apr. 9	Apr. 4, 1905
Hartford, Conn.	5	Apr. 11	Apr. 4, 1897
Jewett City, Conn.	6	Apr. 12	Mar. 27, 1901
Fitchburg, Mass.			Mar. 20, 1898
Framingham, Mass. (near)	5	Apr. 12	Apr. 6, 1887
Southern New Hampshire	9	Apr. 16	Mar. 28, 1908
Plymouth, Me.	7	Apr. 11	Apr. 6, 1879
Westbrook, Me.	4	Apr. 15	Mar. 24, 1894
Portland, Me.	5	Apr. 15	Apr. 9, 1905
Grand Manan, New Brunswick	3	Apr. 8	Apr. 3, 1889
St. John, New Brunswick	5	Apr. 12	Apr. 3, 1892
Scotch Lake, New Brunswick	10	Apr. 11	Mar. 30, 1902
Halifax, Nova Scotia (near)	3	Apr. 17	Mar. 31, 1904
North River, Prince Edward Island	3	Apr. 12	Apr. 8, 1888
Quebec City, Canada	3	Apr. 16	Apr. 14, 1905
Shawneetown, Ill.	2	Mar. 9	Mar. 7, 1885
Gilman City, Mo.	4	Mar. 18	Mar. 16, 1904
Camden, Ind.	4	Mar. 19	Feb. 14, 1885
La Porte, Ind.	4	Mar. 29	Mar. 26, 1893
Waterloo, Ind.	7	Mar. 30	Mar. 23, 1887
Chicago, Ill.	5	Mar. 31	Feb. 28, 1890
Rockford, Ill.	6	Mar. 31	Mar. 21, 1893
Youngstown, Ohio			Mar. 12, 1909
Sandusky, Ohio	12	Apr. 1	Mar. 13, 1907
Oberlin, Ohio	8	Apr. 1	Mar. 20, 1897
Detroit, Mich.	2	Mar. 13	Mar. 11, 1891
Vicksburg, Mich	6	Mar. 25	Mar. 16, 1908
Petersburg, Mich.	7	Mar. 30	Mar. 17, 1897
Plymouth, Mich.	5	Apr. 2	Mar. 30, 1897
Plover Mills, Ontario	5	Mar. 31	Mar. 23, 1897
Dunnville, Ontario	4	Apr. 2	Mar. 29, 1897
Guelph, Ontario	6	Apr. 4	Mar. 26, 1902
Toronto, Ontario	4	Apr. 9	Feb. 1, 1891

Spring migration—Continued.

Place.	Number of years' records.	Average date of spring arrival.	Earliest date of spring arrival.
Ottawa, Ontario	15	Apr. 11	Apr. 3, 1909
Sault Ste. Marie, Ontario			Apr. 19, 1884
Hillsboro, Iowa	5	Mar. 25	Mar. 22, 1897
Indianola, Iowa	5	Mar. 26	Mar. 21, 1901
Grinnell, Iowa			Feb. 12, 1890
Laporte, Iowa	5	Mar. 29	Mar. 21, 1886
Madison, Wis. (near)	8	Apr. 9	Apr. 1, 1892
Meridian, Wis.			Apr. 5, 1897
Lake Andrew, Minn.	7	Apr. 3	Mar. 27, 1895
Heron Lake, Minn.	7	Apr. 5	Apr. 1, 1889
Elk River, Minn.	7	Apr. 5	Mar. 21, 1907
White Earth, Minn.			Apr. 14, 1882
Richmond, Kans. (near)	7	Mar. 25	Mar. 17, 1885
Nebraska City, Nebr. (near)	4	Apr. 11	Mar. 21, 1896
Reaburn, Manitoba	5	Apr. 19	Apr. 15, 1902
Indian Head, Saskatchewan	3	May 9	Apr. 20, 1907
Salida, Colo.			Mar. 19, 1909
Denver, Colo. (near)	8	Apr. 2	Mar. 24, 1908
Cheyenne, Wyo.			Apr. 3, 1885
Sheridan, Wyo.			Apr. 13, 1907
Terry, Mont.	4	May 7	May 2, 1905
Brownfield, Alberta			May 7, 1907

In the southern part of the breeding range the time of nesting is variable. Gundlach found eggs in Cuba through all the months from September to January. Eggs were taken on the Galapagos September 2, 1897 (Rothschild and Hartert). The young found February 5, 1910, at Upper Matecumbe Key, Fla. (Brodhead), were hatched from eggs that must have been laid in December, while at Charleston, S. C., Wayne says that the earliest eggs are deposited the middle of March and that eggs are most common in late March. Young were in the nest May 25, 1875, at Cobb Island, Va. (Bailey); eggs at Wilmington, Del., April 29, 1906 (Pennock); Tully, N. Y., April 29, 1884 (Dakin); Penn Yan, N. Y., May 3, 1896 (Burtch); Oneida Lake, N. Y., May 1, 1884 (Northup); Little Spruce Island, Me., May 16, 1896 (Knight); Kentville, N. S., May 10 (Bishop); Camden, Ind., May 21, 1883 (Evermann); New Bremen, Ohio, April 27, 1908 (Henninger); Dorset, Ohio, May 12, 1900 (Keck); Sunfield, Mich., May 2, 1891 (White); Minneapolis, Minn., May 8, 1888 (Morrison); San Jose Island, Lower California, February 15–18, 1909 (Thayer); Refugio County, Tex., late February, 1896 (Strecker); Beaumont, Tex., March 22, 1887 (Rachford); Laramie, Wyo., May 12, 1901 (Gilmore); Terry, Mont., April 23, 1905 (Terry); San Diego, Cal., April 24, 1861 (Cooper); Napa, Cal., April 4, 1901 (Hottel); Malheur Lake, Oreg., April 16, 1875 (Bendire); and Sumner, Wash., April 20, 1905 (Bowles). Young were noted at Isabella Island, Mexico, April 10, 1905 (Bailey); fledged young at Redwood City, Cal., April 14, 1907 (Carriger and Pemberton); and young three weeks old near Salt Lake City, Utah, April 9, 1907 (Treganza).

Fall migration.

Place.	Number of years' records.	Average date of the last one seen.	Latest date of the last one seen.
Flagstaff, Alberta			Sept. 23, 1906
Terry, Mont	2	Sept. 21	Sept. 24, 1905
Littleton, Colo			Nov. 3, 1908
Margaret, Manitoba	3	Sept. 13	Sept. 15, 1910
Sioux Falls, S. Dak	2	Oct. 26	Oct. 31, 1909
Nebraska City, Nebr			Nov. 8, 1909
Lanesboro, Minn	5	Sept. 17	Oct. 1, 1892
Keokuk, Iowa	4	Oct. 10	Nov. 11, 1900
Lake Forest, Ill			Nov. 22, 1906
Ottawa, Ontario	13	Nov. 1	Nov. 17, 1909
Southwestern Ontario	6	Oct. 24	Dec. 1, 1906
Vicksburg, Mich	5	Nov. 2	Nov. 18, 1902
Northern Ohio	4	Nov. 12	Dec. 19, 1910
North River, Prince Edward Island	4	Oct. 16	Oct. 20, 1890
Pictou, Nova Scotia			Oct. 11, 1894
Scotch Lake, New Brunswick	4	Nov. 5	Nov. 8, 1904
St. John, New Brunswick	7	Oct. 14	Oct. 30, 1889
Quebec City, Canada			Oct. 4, 1894
Montreal, Canada	7	Oct. 31	Nov. 13, 1897
Pittsfield, Me	4	Oct. 24	Nov. 13, 1896
Woods Hole, Mass	4	Nov. 1	Nov. 21, 1891
Renovo, Pa	4	Oct. 17	Nov. 10, 1911
Erie, Pa			Nov. 22, 1902
Washington, D. C			Dec. 5, 1894
Weaverville, N. C			Oct. 11, 1890

European Heron. *Ardea cinerea* Linnæus.

The European heron is entitled to a place in the list of North American birds solely on the strength of its occurrence in Greenland, where it has been taken several times. It is recorded from Nanortalik, 1856, Godthaab, 1862, and January 14, 1877, and Nunarsuit, 1888, all these places being on the west coast; from Eggers Island, at the south extremity of Greenland, the fall of 1893; and once from the east coast.

This heron has a wide distribution in the Eastern Hemisphere, ranging north in Europe and Asia to about latitude 60°, and south to southern Africa, Madagascar, southern Asia, the Malay Islands, and Australia.

Egret. *Herodias egretta* (Gmelin).

Range.—The Gulf States and Mexico and north to Oregon, Wisconsin, and New Jersey; the West Indies, Middle and South America to Patagonia; has wandered north to Manitoba and Nova Scotia.

Breeding range.—In the case of the egret a distinction must be made between the present and the former breeding range, because this is one of the species which has been almost exterminated for the sake of obtaining the dorsal plumes known as aigrettes that are borne at the breeding season. Fifty years ago, before the demands of fashion had called for its slaughter, the egret nested in great colonies in Florida, the other Gulf States, and several States of the

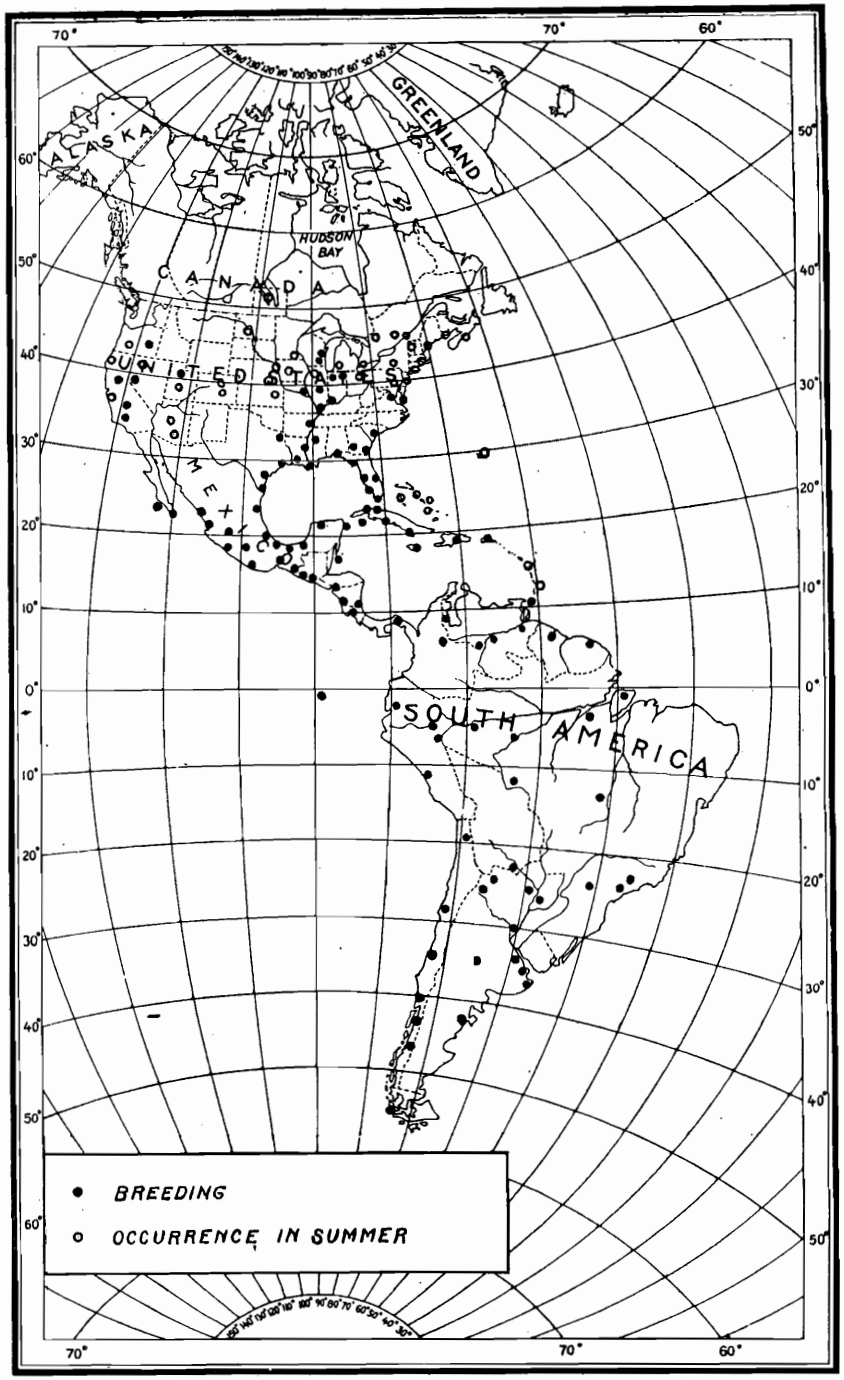

FIG. 14.—Egret (*Herodias egretta*).

Mississippi Valley. The nests were usually placed on large trees growing in water, and hence the colonies were restricted to the heavy swamps near the coast or to the bottom lands of the larger rivers inland. The birds nested commonly north along the Atlantic coast to Charleston, S. C. (Audubon). They undoubtedly nested in some of the many favorable localities on the coasts of North Carolina and Virginia, where actual records are very few, and thence north to southern New Jersey, where in Wilson's time a small colony bred near Cape May. The egret once nested in Arlington Cemetery, Virginia, near Washington, D. C. (Wm. Palmer).

The bottom lands of the Mississippi River and its larger tributaries furnished an abundance of suitable nesting sites, and here were the largest colonies outside of Florida. As many as a thousand birds have been seen in a single colony in Daviess County, Ind. So generally distributed were these herons in Indiana that they have been known to nest in Knox, Gibson, Daviess, Dekalb, Steuben, Noble, Jasper, Porter, Lake, and Starke Counties. The southern third of Indiana marked the northern limit of the larger breeding colonies, but smaller colonies nested north to northern Indiana and even two-thirds of the way up the western shore of Lake Michigan to Two Rivers, Wis. (Kumlein and Hollister). The egret also nested as far north as Grand Ridge, Ill. (Soule); Canton, Ill. (Cobleigh); Lincoln County, Mo. (Widmann); and Texarkana, Tex. (Oberholser).

The Great Plains and the Rocky Mountain region offered little inducement to the egret, and it seems to have been absent during the breeding season from the whole of this great area except that a few nested near Great Salt Lake, Utah (Ridgway). A few small colonies existed in California, at Buena Vista Lake (Linton); Summit Lake (Goldman); and Sacramento (Ridgway); also in the Truckee Valley, Nev. (Ridgway); and north to Malheur Lake, Oreg. (Bendire), which was formerly the home of probably the largest colony on the Pacific slope. Here, contrary to their habit in most parts of their range, the birds were necessarily forced to nest among the reeds.

South of the United States the former breeding range of the egret seems to have included all of Central America and the whole of South America south to Port Otway, Patagonia (Sclater and Salvin). It is to be understood, of course, that the species was very local throughout this whole region, being restricted to the few places favorable for nesting sites situated principally on the coasts, the larger lakes, and the borders of the lower parts of the larger rivers, especially the Parana, the Paraguay, and the upper Orinoco. The egret nested on the four large islands of the Greater Antilles, but seems to have been rare in the West Indies east of

Porto Rico, though recorded from Dominica (Verrill), Barbados (Manning), and Trinidad (Leotaud), and from the islands of New Providence, Andros, Eleuthera, Watlings, and Long, in the Bahamas (Riley). It nested on the Galapagos (Rothschild and Hartert).

Many herons have the strange habit of migrating northward after the breeding season and are often common for several weeks in the fall in districts far north of the breeding range. The egret is a conspicuous example of birds with this habit, and these northward movements in the fall have brought them to many places in Ohio, New York, and New England, and north to Halifax, N. S. (Jones); Grand Manan, N. B. (Deane); Calais, Me. (Boardman), near Portland, Me. (Knight); Godbout, Quebec (Comeau); Montreal, Canada (Wintle); Rockcliffe, Ontario (McIlwraith); Lake Nipissing, Ontario (Seton); Rondeau, Ontario (McIlwraith); Kalamazoo, Mich. (Gibbs); Lanesboro, Minn. (Hvoslef); also northwestward in the Missouri River Valley to Emporia, Kans. (Kellogg); Fairbury, Nebr. (Swenk); Colorado Springs, Colo. (Aiken); Denver, Colo. (Rockwell); Barr, Colo. (Hersey and Rockwell); Badger Lake, Iowa (Lewis and Clark); Fort Lincoln, N. Dak. (Grinnell); and even north to Lake Winnipegosis, Manitoba (Seton).

The above statement represents the range of the egret before the demands of the millinery trade had so woefully depleted its numbers. Now the great colonies are entirely a thing of the past. The plume hunter has made a clean sweep of all the heronries that were large enough to make their exploitation profitable. Nor has the destruction been confined to the birds of the United States. The same story of wholesale slaughter comes from Mexico, Central America, the West Indies, and lastly from South America. It is probable that the largest colonies still in existence are to be found in Venezuela or near the equator, but even in these regions, remote and difficult of access, the high market value of the plumes has proved a sufficient incentive for the overcoming of all hardships, and the colonies remaining are but a small part of the original numbers. A few small colonies still exist in widely separated parts of Florida, where breeding birds have been reported during the last few years from Monroe County (Bent); Kissimmee (Beers); Sebastian (Chapman); Orange Lake (Baynard); and Tallahassee (Williams). The species nested in 1910 near Charleston, S. C. (Wayne); a small flock was seen during the breeding season of 1909 near Ellis Lake, N. C. (Philipp); and a few birds nested in 1911 near Orton, Brunswick County, N. C. (Brimley). It nested in 1908 near the delta of the Mississippi, La. (Bowdish); and there were a few nests in 1910 at Walkers Lake, Ark. (Widmann). On the Pacific slope, the great heronry at Malheur Lake, Oreg., has been wiped out, except a few

birds that still lingered in the vicinity in 1911, and the few remaining birds of California are to be found in the vicinity of Tulare Lake (Goldman) and Clear Lake (Finley). Birds still wander north occasionally in the fall and during the last 10 years have been recorded from Eastham, Mass., 1911 (Cobb); Plymouth, Mass., 1911 (Farley); Marshfield, Mass., 1911 (Barrett); East Greenwich, R. I., August 16, 1904 (Allen); Point Judith, R. I., August 2, 1909 (Howe); Connecticut, 1911 (Howes); Montauk, N. Y., July 23, 1900 (Braislin); Ontario County, N. Y., August, 1905 (Reed); East Windham, N. Y., July 18, 1906 (Weber); Ridgwood, N. J., July, 1902 (Hales); Wading River, N. J., August, 1905 (Stone); Englewood, N. J., July 22, 1906 (Lemmon); Black Point, N. J., July 6, 1908 (Howe); Seabright, N. J., August 5, 1908 (Howe); Berwyn, Pa., July 26, 1902 (Burns); Bristol, Pa., July 20, 1906 (Harlow); Ashbourne, Pa., July 30, 1906 (Harlow); Washington, D. C., August 19 to 24, 1912 (Appel); Cincinnati, Ohio, August, 1902 (Stone); West Huron, Ohio, September, 1911 (Klein); Waterloo, Ind., April 22, 1905 (Link); Nehawka, Nebr., May 2, 1905 (Swenk); near Denver, Colo., April 26, 1907 (Rockwell); and Lawen, Oreg., May 5, 1909 (Hibbard).

Winter range.—The egret is resident throughout its range in Central and South America and the Greater Antilles. In the United States it winters in the southern half of Florida north to Gainesville (Chapman); on the coast of Louisiana (Beyer); on the coast of Texas (Audubon); and in southern California north to Santa Cruz (Breninger); and San Rafael (Mailliard). One was taken January 8, 1878, near Fort Klamath, Oreg. (Mearns), but the species does not winter regularly in that locality.

Spring migration.—The egret breeds so little north of its winter home that its regular migrations are short and quickly accomplished. Most of the movements are in March and early April, as shown by the following dates of spring arrival: Cumberland, Ga., March 7, 1902 (Helme); Charleston, S. C., March 28, 1909 (Weston); Rodney, Miss., March 22, 1889, and March 19, 1890 (Mabbett); St. Louis, Mo., April 9, 1886 (Widmann); Canton, Ill., April 11, 1895 (Cobleigh); Bloomington, Ind., April 10, 1887 (Evermann); near Vincennes, Iowa, April 17, 1894 (Currier); Tucson, Ariz., April 23, 1881 (Brewster); Fresno County, Cal., April 5, 1890 (Eaton); and Stockton, Cal., April 1, 1878 (Belding).

The egret breeds through such a wide range of latitude, both north and south of the equator, that it is natural that the nesting dates should show a wide variation. At the south end of the range in Chile and Argentina the height of the nesting season is in October and November; British Guiana, eggs in June (Lloyd); Haiti, February 18, 1895 (Christy); Cuba, March to June (Gundlach); Port Henderson, Jamaica, June 25, 1890 (Field); Lake Okechobee, Fla., February 4, 1896 (Stone); Gainesville, Fla., June 14, 1893 (specimens in U. S. National Museum); near Charleston, S. C., April 7, 1910 (Wayne); Brownsville, Tex., young half grown May 15, 1877 (Sennett); eggs near Corpus Christi, Tex., April 4, 1882 (specimens in U. S. National Museum); Camp Harney, Oreg., April 16, 1877 (Bendire).

Fall migration.—The northward migration after the close of the breeding season begins in early July, and by the middle of the month the young birds are far north of the home of their birth. These wanderings last for a month to six weeks, and by late August or early September most of the birds have returned to the winter home. Occasionally a few birds remain in the north much later: Stockton, Cal., December 7, 1878 (Belding); near Richmond, Me., August 20, 1896 (Knight); Nantucket, Mass., September 20, 1890 (Mackay); Ipswich, Mass., November 22, 1892 (Vickary); Orleans County, N. Y., November 28, 1883 (Davison); Marcy, N. Y., November 10, 1889 (Ralph and Bagg); Jamaica Bay, N. Y., October 1, 1897 (Braislin); Ocean City, Md., September 23, 1894 (Taylor); and St. Louis, Mo., September 2, 1896 (Widmann).

Snowy Egret. *Egretta candidissima* (Gmelin).

Range.—The Western Hemisphere from Chile and Argentina north to the Gulf States and Mexico; has wandered north to Nova Scotia, Ontario, and British Columbia.

Breeding range.—The snowy egret is another plume bird which, like the larger egret, has been sadly diminished in numbers by the demands of fashion for the beautiful aigrettes that are carried during the breeding season. In fact, the snowy egret has suffered a severer persecution than any other heron and has been practically exterminated over large areas where once it was common. Formerly this species had a wide distribution, breeding abundantly in the Gulf States and commonly along the Atlantic to Charleston, S. C. (Wayne). Smaller colonies occurred on the coast of North Carolina and Virginia, and a large colony near Cape May, N. J., marked the northern limit of the breeding range. This last colony was visited by Wilson in 1812 and found to cover an extensive area. It was still well populated in 1886, but in 1888 only one pair remained, and the explanation was: "They have been almost exterminated, though formerly very abundant, one ornithologist having recently shot 73 birds in one day" (Parker).

Though abundant as a breeder near the mouth of the Mississippi, the snowy egret seems never to have nested in large colonies far back from the coast. In Audubon's time the bird was fairly common north to Memphis, Tenn., but only a few have nested to the northward, and their northern limit seems to have been reached in Knox

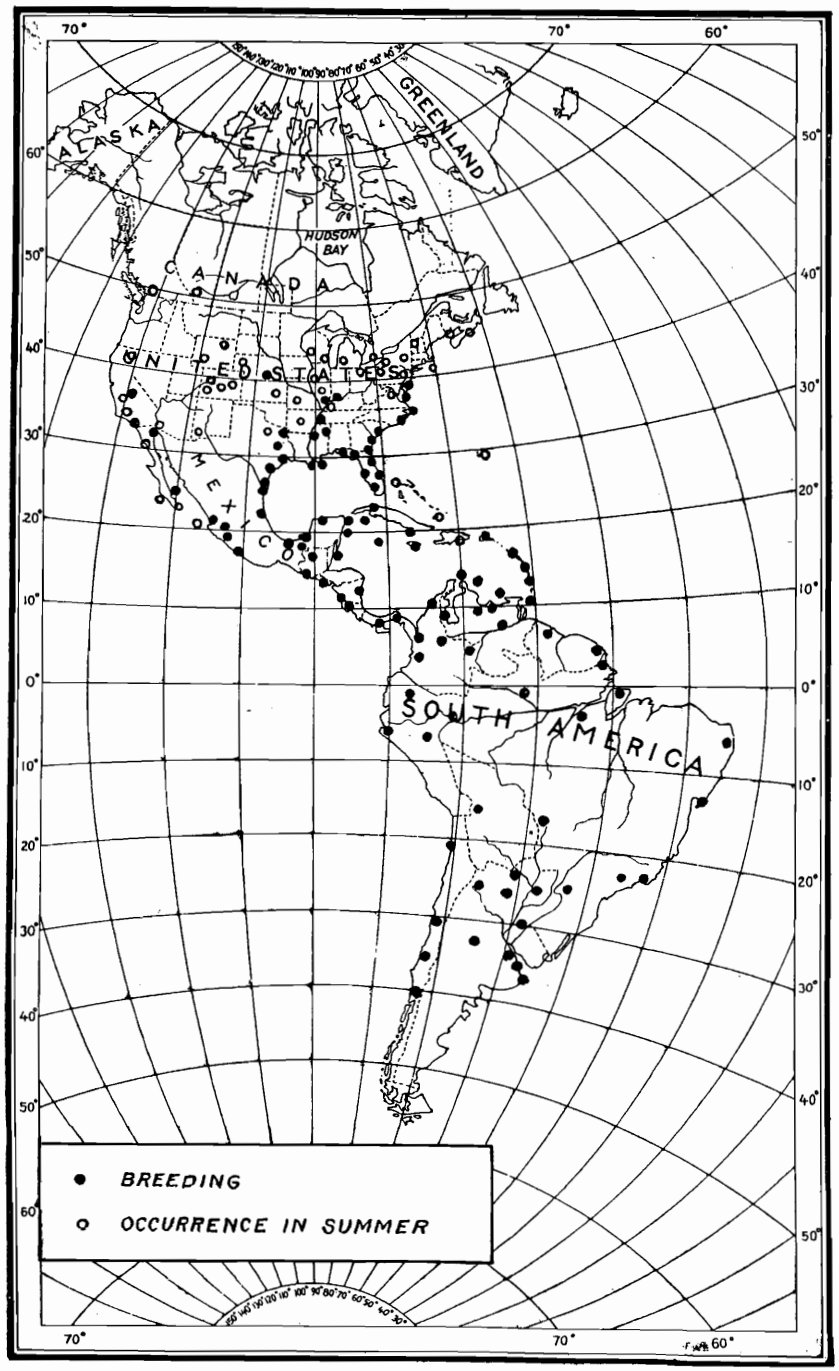

FIG. 15.—Snowy egret (*Egretta candidissima*).

County, Ind. (Ridgway). The nesting of this species, June, 1895, at Lincoln, Nebr. (Eiche), was probably fortuitous.

West of Louisiana numbers of this species become less, though it nested at favorable localities along the whole Texas coast, and there was a large colony near the mouth of the Rio Grande (Merrill); it also nested up some of the larger streams to Tarkington (Gaut) and Texarkana (Oberholser). As a breeder it was absent from the whole Rocky Mountain region and Pacific slope of the United States, the northern limit of the breeding range on the Pacific being found near San Jose Island, Lower California (Brown), and Rosario, Sinaloa (Nelson).

The snowy egret nested on both coasts of Mexico and on the larger interior waters. These breeding haunts were invaded by the plume hunters after the United States birds had been killed off and for several years furnished large shipments of aigrettes. Even as late as 1900 some of these colonies had not yet been destroyed. In the spring of that year, at Paligada, Tabasco, the owner of a tract of land containing a large heronry sold for a thousand dollars the right to shoot them, and the birds were exterminated that season. The breeding range also included the lower parts of Central America and South America, south to Valdivia, Chile (Boeck), and to Cape San Antonio, Argentina (Gibson). The species was also a common breeder in the Greater Antilles and less common in the Lesser Antilles, but seems to have been rare in the Bahamas, being recorded only from Inagua (Cory) and Great Bahama (Cory), while only a few specimens have been taken in Bermuda at the times of spring and fall migration.

The snowy egret has the same habit as the larger egret (*Herodias egretta*) of migrating north of the breeding grounds, though the number of such migrants has not been so great nor have the wanderings been so extensive as in the case of the larger relative. There are some half dozen records for Long Island, N. Y. (Braislin), and one for Buffalo, N. Y. (Eaton). The species is recorded from Stratford, Hartford, Saybrook, and Groton Long Point, Conn. (Merriam); Nantucket, Mass., March, 1882 (Purdie); St. Albans, Vt., October, 1890 (Howe); Grand Manan, N. B. (Boardman); near Halifax, N. S., 1868, and Windsor, N. S., 1872 (Downs); in each of the counties in Ohio along Lake Erie (Jones); Dunnville and Long Point, Ontario (McIlwraith); Keokuk, Iowa (Praeger); Des Moines, Iowa (Keyes); Lake Koskonong, Wis., August, 1886 (Skavlem); Topeka, Kans., August 15, 1872 (Prentice); Fremont, Nebr., September 4, 1893 (Trostler); near Laramie, Wyo., early May, 1902 (Knight); Buffalo, Wyo., about April 11, 1904 (Felger); near Calgary, Alberta, May 11, 1901 (Dippie); Burrard Inlet, B. C., May, 1879 (Fannin).

ville, Tex. (Merrill). It breeds somewhat commonly in the Bahamas from Great Bahama (Cory) and Abaco (Ridgway) on the north to Caicos (Cory) on the south; is rare in Cuba (Gundlach), and is recorded from Jamaica (March) and Haiti (Cory). It breeds at San Jose Island, Lower California (Brown); near San Blas, Tepic (Nelson); and on the coast and islands of Yucatan (Salvin, Lawrence, and Nelson). It has been taken at Chiapam, Guatemala (Salvin); and at Tehauntepec, Oaxaca (Sumichrast); and, as the species is largely nonmigratory, probably it breeds at or near both these localities.

A few instances have been noted of the wandering of the reddish egret north of its breeding range. Several were seen in August, 1875,

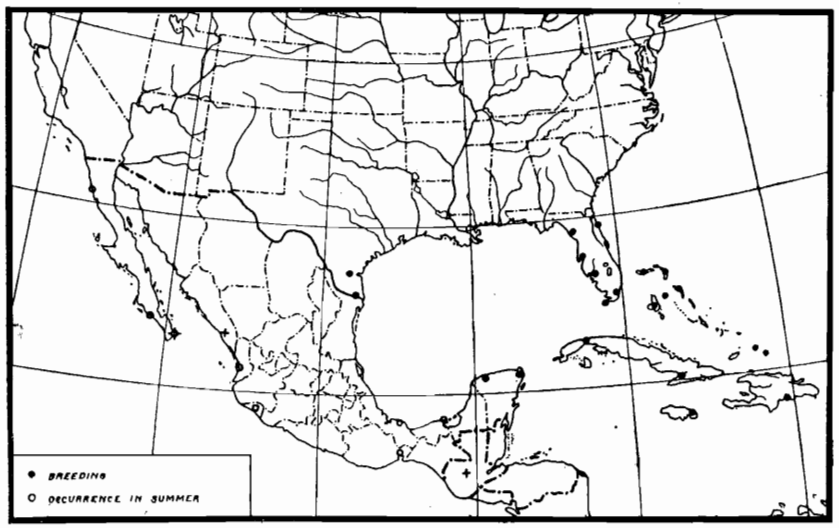

FIG. 16.—Reddish egret (*Dichromanassa rufescens*).

near Cairo, Ill. (Nelson); one was taken near Colorado Springs, Colo. (Aiken); and one near Golden, Colo. (Berthoud); and several were seen at San Quintin, Lower California (Anthony).

It is partially migratory along the north limit of the breeding range, and few, if any, remain in Louisiana through the whole of the winter, but the species does winter in southern Florida (Scott) and in Mexico as far north as Mazatlan, Sinaloa (Lawrence), and La Paz, Lower California (Belding).

Eggs were found near Corpus Christi, Tex., March 24, 1878 (Sennett); young in the nest, May 3, 1890, at Captive Pass, Fla. (Jamison); and young on the wing, April 15, 1901, Cozumel Island, Yucatan (Nelson). Gundlach says that in Cuba it nests from July to October.

Louisiana Heron. ***Hydranassa tricolor ruficollis*** (Gosse).

The Louisiana heron, as a whole, ranges from the Gulf States and Mexico south to northern South America. It has been separated into two subspecies, of which the northern, *ruficollis*, extends north to North Carolina, Texas, and central Mexico, and south throughout the Bahamas, the Greater Antilles, and Middle America to Ecuador and Venezuela.

The principal breeding range of the Louisiana heron in the United States is found in Florida and along the Gulf coast to Texas. On the Atlantic coast it is common north to Charleston, S. C. (Wayne), and in Audubon's time it was considered abundant on the coast of

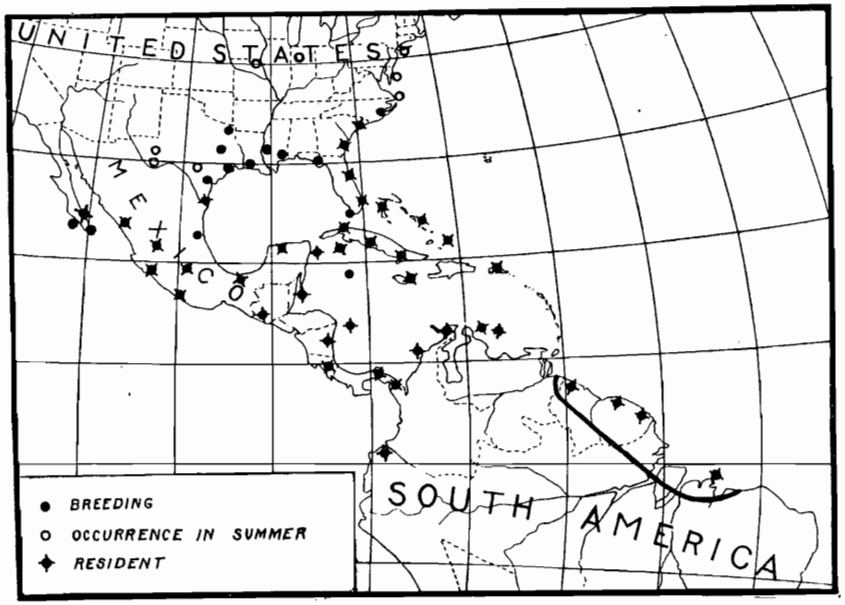

FIG. 17.—Louisiana heron (*Hydranassa tricolor ruficollis*).

North Carolina, where it was still not uncommon near Beaufort in 1898 (Pearson), and nested commonly near Orton, Brunswick County, in 1911 (Brimley). This seems to be the northern limit of the breeding range.

In the Mississippi Valley it has nested north to Rodney, Miss. (Mabbett); and Texarkana, Tex. (Oberholser). It seldom wanders far north of its breeding ground, but a few have been noted at Cobb Island, Va. (Ridgway); Patchogue, N. Y., the summer of 1836 (Giraud); Sand Ridge, Clark County, Mo., April 13, 1890 (Currier); near Hanna, Ind., June 26, 1876 (Nelson); Stockton, Tex. (Dresser); and Terlingua, Tex. (Oberholser).

the Atlantic coast the bird breeds commonly as far north as Charleston, S. C. (Wayne), Orton, Brunswick County, N. C., 1911 (Brimley), and used to be common as a breeder even to Currituck Sound, N. C. (White). In Wilson's time a few nested near Cape May, N. J. This heron penetrated inland to breed to a greater extent than many of the species and has been known to nest near Chester, S. C. (Loomis); Greensboro, Ala. (Avery); on the Mississippi River as far north as Osceola, Ark. (Richardon); and in Texas as far as Texarkana (Oberholser), and Long Lake (Oberholser).

The breeding range extends along the eastern coast of Mexico and on the western coast north to San Blas, Tepic (Nelson); thence throughout Central America and northern South America south to Santa Elena, Uruguay (Aplin); Mercedes, Argentina (Burmeister); and Tumbez, Peru (Taczanowski); also in the whole of the West Indies and in the northern Bahamas, Andros, and New Providence (Cory).

The little blue heron is another of the species that has the habit of wandering north in fall far beyond the breeding range. At this season it is tolerably common along the Potomac near Washington, D. C., from July 7, 1894 (Richmond) to September 24, 1911 (Preble), and has occurred north nearly to Baltimore, Md., October 7, 1892 (Fisher); Maplewood, N. J., July 27, 1897 (Owen); Seaford, N. Y., August 13, 1902 (Braislin); Old Lyme, Conn., July 21, 1899 (Brockway); Saybrook, Conn., August 12, 1881 (Clark); Warwick, R. I., July 13, 1878 (Deane); Stoughton, Mass., August 22, 1908 (McKechnie); Amherst, N. H., April 28, 1897 (Melzer); Vinalhaven, Me., April 1, 1902 (Arey); Whitneyville, Me., August 16, 1906 (Knight); Scarborough, Me., September, 1881 (Brown); once in Nova Scotia (Downs); L'Anse au Loup, Quebec, May 23, 1900 (Bangs); near Quebec City, Canada, October, 1881 (Dionne); abundant in southeastern Missouri July to September (Widmann); Seymour, Ind., October 8, 1911 (Peter); Loramie Reservoir, Ohio, July 16, 1909 (Henninger); near Oberlin, Ohio, one about 1882 (McCormick); Aylmer, Ontario, August 15, 1901 (Ames); Detroit, Mich., May 2, 1882 (Taverner); Racine County, Wis., August 28, 1848 (Hoy); Cedar Rapids, Iowa, fall 1903 (Berry); near Omaha, Nebr., August 15, 1903 (Trostler); Neosho Falls, Kans. (Goss); Howard Creek, Tex., August, 1902 (Hollister); and Montrose, Colo., September 14, 1910 (Walker). In Bermuda it has been taken in April, May, September, and October (Hurdis).

The little blue heron was found building in April on Tobago Island, West Indies (Jardine); eggs have been taken in Porto Rico, May to July (Gundlach); Grenada, West Indies, April 14 to June 21 (Oates); Jamaica, June 3 to July 8, 1890 (Field); Cuba, May to July (Gundlach); Alachua County, Fla., April 8, 1890 (Pearson); Tarpon Springs, Fla., August 26, 1886 (Scott); Charleston, S. C., April 7, 1910, much earlier than usual (Wayne); Avery Island, La., May 4, 1895 (Knight); Corpus Christi, Tex., June 12, 1884 (specimens in U. S. National Museum).

Winter range.—This species remains in winter throughout the larger part of its coastal breeding range in the United States, staying north regularly and commonly as far as Charleston, S. C. (Wayne), and a few on Currituck Sound (McAtee). It is not rare in winter on the coasts of Louisiana and Texas (McAtee), though the larger part of the breeding birds in all the above-mentioned places retire farther south for the winter. The winter range on the Pacific coast of Mexico includes the district north to Ocotlan, Jalisco (Goldman), and to Mazatlan, Sinaloa (Lawrence).

Spring migration.—The arrival of the species in the spring was noted at Whitfield, Fla., March 21, 1903 (Worthington); Chipley, Fla., March 12, 1903 (Pleas); Cumberland, Ga., March 8, 1902 (Helme); Frogmore, S. C., average of four years March 31, earliest March 22, 1886 (Hoxie); New Orleans, La., average March 13, earliest March 11, 1894 (Beyer); Bay St. Louis, Miss., March 13, 1902 (Allison); St. Louis, Mo., April 30, 1880 (Hurter); and Bicknell, Ind., April 18, 1896 (Chansler).

The last two dates, taken in connection with several others already given, show that a few little blue herons migrate or wander north in the spring beyond the normal breeding range, but there are no dates to indicate that such birds remain the rest of the summer in the north as nonbreeders, and probably they soon return southward.

The birds of the southern part of the range have been separated as the subspecies *cærulescens* (Latham), which includes all of South America and parts of the Antilles and Central America. The dividing line between these two forms is not yet definitely known.

[Zeledon Boatbill. ***Cochlearius zeledoni*** **(Ridgway).**

The Zeledon boatbill occupies nearly the whole of Mexico and Central America from Sinaloa (Mazatlan), Tamaulipas (Alta Mira), and Yucatan (Cozumel Island), south and east to Porto Bello, Panama (Goldman).]

[Pileated Heron. ***Pilherodius pileatus*** **(Boddaert).**

This heron is a South American species that was once taken 50 years ago along the line of the Panama Railroad (Lawrence). Since it has not been noted by the many collectors who have visited Panama in the last few years, it is probably now extinct in that country. The range in South America extends south to Peru (Pebas, Santa Cruz, and Nauta) and to Sao Paulo, Brazil.]

Green Heron. *Butorides virescens virescens* (Linnæus).

Range.—The green herons as a whole include several forms which range over most of the United States, all of Mexico, Central America, and the West Indies, and in South America are found in northeastern Colombia, northern Venezuela, and northeastern Brazil.

Breeding range.—The typical form, true *virescens*, breeds north to St. John, New Brunswick (Chamberlain); Montreal, Canada (Wintle); Loughboro Lake, Ontario (Clarke); Guelph, Ontario (Klugh); Kelley Brook, Wis. (Shoenebeck); Minneapolis, Minn. (Grant); and Vermilion, S. Dak. (Agersborg). In the west the species seems to be absent as a breeder from the western part of the plains and the whole of the middle and northern Rocky Mountains. The breeding range extends westward to about the ninety-ninth merdian, except in the Rio Grande Valley, up which the species ranges to the Rio Conchas (J. W. Audubon). The birds have wandered north in summer to Prospect, Nova Scotia (Downs), and on April 15, 1881, after a storm, they were actually common at Westport, Nova Scotia (Chamberlain). They have also been seen north to Ottawa, Ontario (White); Neebish Island, Mich. (Boies); Fort Sisseton, S. Dak (McChesney); and west to Loveland, Colo., July 23, 1895 (Preble); Rinconada, N. Mex. (Surber); and Pecos City, Tex. (Donald).

The breeding range extends south to include the whole of Florida and the Gulf States, eastern Texas, the eastern coast of Mexico, the whole of southern Mexico, Yucatan, and south to Duenas, Guatemala (Salvin and Sclater), and east to Ceiba, Honduras (Bangs). The species breeds also on the west coast of Mexico north to Tepic (Nelson and Goldman).

Winter range.—The green heron winters throughout its range in Mexico and Central America, but no migrating birds from the United States seem to pass any farther south in winter than the region inhabited by the species in summer. Not even in Cuba or the Bahamas has the form of the green heron breeding in Florida and the eastern United States been as yet detected. Since the species is very rare in winter in southern Florida and southern Texas and is absent at this season from the rest of the Gulf States, it follows that nearly all of the tens of thousands of green herons that breed in the eastern United States must reach a winter home in Yucatan and southward by a direct flight across the Gulf of Mexico. The species has been noted in winter north to Gainesville, Fla. (Chapman); Sarasota Bay, Fla. (Bryant); Capers Island, S. C. (Wayne); and Brownsville, Tex. (Merrill).

Spring migration.

Place.	Number of years' records.	Average date of spring arrival.	Earliest date of spring arrival.
Central Florida	5	Mar. 17	Feb. 8, 1905
St. Marys, Ga. (near)	3	Mar. 23	Feb. 8, 1902
College Park, Ga.			Mar. 23, 1906
Frogmore, S. C.	6	Mar. 26	Mar. 21, 1889
Raleigh, N. C.	12	Apr. 7	Mar. 29, 1893
Weaverville, N. C.	4	Apr. 20	Apr. 10, 1891
White Sulphur Springs, W. Va.	6	Apr. 23	Apr. 14, 1892
Washington, D. C.	11	Apr. 19	Apr. 9, 1905
Waynesboro, Pa.	5	Apr. 21	Apr. 17, 1896
Philadelphia, Pa. (near)	8	Apr. 24	Apr. 16, 1884
Renovo, Pa.	10	May 7	Apr. 24, 1899
Morristown, N. J.	4	Apr. 25	Apr. 18, 1909
New Providence, N. J.	10	Apr. 30	Apr. 23, 1893
Ithaca, N. Y.	2	Apr. 20	Apr. 18, 1906
New York, N. Y. (near)	9	May 4	Apr. 24, 1890
Branchport, N. Y.	10	May 1	Apr. 21, 1900
Ballston Spa, N. Y.	4	May 8	May 7, 1890
New Haven, Conn. (near)	5	Apr. 29	Apr. 27, 1886
Hartford, Conn. (near)	5	Apr. 28	Apr. 26, 1896
Providence, R. I.	9	May 5	Apr. 25, 1899
Fitchburg, Mass.	6	May 7	May 5, 1907
Needham, Mass.			Apr. 9, 1905
Randolph, Vt.			May 7, 1887
Portland, Me.			Apr. 25, 1905
Montreal, Canada			Apr. 30, 1895
New Orleans, La.			Mar. 21, 1894
Rodney, Miss. (near)	3	Apr. 10	Mar. 26, 1889
Athens, Tenn.			Mar. 30, 1904
Lexington, Ky.	5	Apr. 20	Apr. 11, 1904
Monteer, Mo.	3	Apr. 23	Apr. 10, 1905
Iberia, Mo.	4	Apr. 30	Apr. 27, 1905
St. Louis, Mo.	3	May 2	Apr. 17, 1886
Bloomington, Ind.	7	Apr. 19	Apr. 10, 1903
Terre Haute, Ind.	4	Apr. 20	Apr. 13, 1889
Greencastle, Ind.	5	Apr. 21	Apr. 16, 1894
Brookville, Ind.	6	Apr. 21	Apr. 17, 1888
Fort Wayne, Ind.	5	Apr. 24	Apr. 22, 1909
Waterloo, Ind. (near)	9	May 2	Apr. 13, 1905
Delaware, Ohio	4	Apr. 25	Apr. 21, 1906
Youngstown, Ohio	5	Apr. 25	Apr. 21, 1906
Oberlin, Ohio	14	Apr. 26	Apr. 14, 1899
Vicksburg, Mich.	3	May 6	Apr. 25, 1908
Guelph, Ontario (near)	5	May 14	May 11, 1900
Keokuk, Iowa	10	May 1	Apr. 21, 1893
Iowa City, Iowa	8	May 1	Apr. 24, 1891
Laporte, Iowa	5	Apr. 28	Apr. 24, 1884
Chicago, Ill.	12	Apr. 28	Apr. 11, 1908
Delavan, Wis.			Apr. 20, 1896
Madison, Wis. (near)	7	May 5	Apr. 26, 1901
Lanesboro, Minn.	5	May 4	Apr. 23, 1885
Beaumont, Tex.			Apr. 4, 1887
Kerrville, Tex.	7	Apr. 20	Apr. 7, 1906
Manhattan, Kans.	5	Apr. 25	Apr. 16, 1883
Onaga, Kans.	8	May 7	Apr. 21, 1904
Southeastern Nebraska	8	Apr. 30	Apr. 15, 1899

Eggs have been found at Manatee River, British Honduras, April 21, 1906 (Thayer); Sarasota Bay, Fla., April 18 to June 1 (Bryant); near Orange Hammock, Fla., March 23, 1895, well incubated (Palmer); Frogmore, S. C., April 13, 1870, and June 11, 1886 (Hoxie); Chatham County, N. C., April 20, 1886 (Brooks); Baltimore, Md., April 22, 1881, to June 12, 1894 (Kirkwood); Holland Patent, N. Y., May 16, 1890 (Williams); Canaan, Conn., May 15, 1886 (Tobey); Sunapee, N. H., June 16, 1886 (Bowles); Avery Island, La., April 9, 1893 (specimens in U. S. National Museum); Bernadotte, Ill., May 5, 1891 (Knight); Bloomington, Ind., May 11, 1903 (McAtee);

Sedan, Ind., May 14, 1897 (Hine); Philo, Ill., May 21, 1905 (Hess); Polo, Ill., May 25, 1884 (Kline); Seneca County, Ohio, May 10, 1904 (Henninger); Vicksburg, Mich., June 1, 1904 (Rapp); Charleston Lake, Ontario, June 14, 1899 (Clarke); Davenport, Iowa, May 7, 1892 (Wilson); Brownsville, Tex., May 2, 1877 (specimens in U. S. National Museum); Manhattan, Kans., May 13, 1884 (Lantz); Peru, Nebr., June 2, 1882 (Taylor and Van Vleet).

Fall migration.

Place.	Number of years' records.	Average date of the last one seen.	Latest date of the last one seen.
Montreal, Canada	2	Sept. 1	Sept. 2, 1897
Pittsfield, Me	3	Sept. 21	Oct. 2, 1898
Southwestern Ontario	3	Sept. 18	Sept. 22, 1900
Southern Michigan	8	Sept. 19	Oct. 4, 1903
Madison, Wis			Sept. 14, 1911
Lanesboro, Minn	4	Sept. 13	Sept. 25, 1897
Dunbar, Nebr			Sept. 24, 1904
Onaga, Kans	8	Sept. 16	Oct. 5, [illegible]
Bonham, Tex			Sept. 20, [illegible]
Southern Iowa	4	Sept. 24	Oct. 17, [illegible]
Chicago, Ill			Sept. 22, [illegible]
Greensburg, Ind			Oct. 7, [illegible]
Waterloo, Ind. (near)	4	Sept. 19	Sept. 30, [illegible]
Waverly, Ohio			Oct. 1, [illegible]
Oberlin, Ohio			Nov. 13, 1897
Athens, Tenn			Oct. 10, 1902
Durham, N. H			Oct. 13, 1900
North Truro, Mass			Oct. 5, 1888
Providence, R. I	9	Sept. 15	Sept. 29, 1897
Hartford, Conn. (near)	5	Sept. 11	Oct. 1, 1894
Central New York	12	Sept. 19	Oct. 2, 1902
Morristown, N. J	4	Sept. 17	Oct. 2, 1903
New Providence, N. J	4	Sept. 17	Oct. 10, 1894
Beaver, Pa	3	Sept. 21	Sept. 25, 1907
Renovo, Pa	6	Sept. 21	Oct. 14, 1905
Washington, D. C	5	Aug. 27	Oct. 2, 1910
Weaverville, N. C			Oct. 10, 1891
Frogmore, S. C			Oct. 4, 1888
St. Marys, Ga			Oct. 24, 1905
Orlando, Fla			Nov. 18, 1888

Anthony Green Heron. *Butorides virescens anthonyi* (Mearns).

The breeding range of the Anthony green heron extends north to Ukiah, Cal. (McGregor), and to Colusa, Cal. (Hollister). The species has wandered north to Yreka, Cal., August 20, 1883 (Townsend), and to Fort Klamath, Oreg., May 4, 1887 (Merrill). It breeds south as far as the Coronados Islands, Lower California (Anthony), Yuma, Ariz. (Coues), and Tombstone, Ariz. (Willard), and northeast to Big Sandy, Ariz. (Stephens), and Camp Verde, Ariz. (Mearns).

It winters in Mexico from Ocotlan, Jalisco (Nelson and Goldman), and the Valley of Mexico (specimen in U. S. National Museum) south to Zamora, Michoacan (Nelson and Goldman), and to Tehuantepec, Oaxaca (Lawrence).

In migration it occurs at San Jose del Cabo, Lower California (Brewster), and Victoria, Tamaulipas (Sennett). A specimen taken November 27, 1896, at San Jose, Costa Rica, is undistinguishable from the Mexican bird.

In spring migration the earliest appearance at Tombstone, Ariz., was on April 22, 1909 (Willard); Sebastopol, Cal., March 12, 1885 (Belding); Stockton, Cal., average April 9, earliest April 4, 1885 (Belding). Eggs are in the U. S. National Museum that were taken May 24, 1890, at Silver Lake, near Tucson, Ariz., and eggs were taken on the Sespe River, Ventura County, Cal., May 12, 1910 (Peyton).

Frazar Green Heron. *Butorides virescens frazari* (Brewster).

The Frazar green heron is restricted to the southern end of Lower California, where it is resident at La Paz, in the region around Magdalena Bay and north to San Ignacio (Nelson and Goldman). Eggs were taken near La Paz May 8 to 26, 1910 (Thayer).

Green Heron. *Butorides virescens* (subspp.).

The two forms of the green heron *virescens* and *anthonyi* are the only ones that occur in the United States. These two forms include the migratory green herons, which have a wide range and perform migrations extending often more than a thousand miles. In southern Central America, northern South America, and throughout the whole of the West Indies the green herons seem to be strictly resident, and as a consequence they have become modified into a large number of local forms or subspecies.

Mr. H. C. Oberholser has recently made an extended study of the green herons, and his conclusions as to the ranges of the various forms are given below:

Chihuahua Green Heron, *Butorides virescens eremonomus* Oberholser. Chihuahua and Durango, Mexico, in summer; south to Michoacan, Mexico, in winter.

Nicaragua Green Heron, *Butorides virescens mesatus* Oberholser. Western Nicaragua.

Panama Green Heron, *Butorides virescens hypernoteus* Oberholser. Costa Rica, Panama, and northern South America, south to Medellin, Colombia, and Para, Brazil.

Swan Island Green Heron, *Butorides virescens saturatus* Ridgway. Swan Island, Caribbean Sea.

San Miguel Green Heron, *Butorides virescens margaritophilus* Oberholser. San Miguel Island, Panama.

Bahama Green Heron, *Butorides virescens bahamensis* (Brewster). The Bahama Islands.

Cuba Green Heron, *Butorides virescens cubanus* Oberholser. The Greater Antilles and east in the Lesser Antilles to Guadeloupe Island.

St. Christopher Green Heron, *Butorides virescens christophorensis* Oberholser. St. Christopher Island, Lesser Antilles.

Dominica Green Heron, *Butorides virescens dominicanus* Oberholser. Dominica Island, Lesser Antilles.

Martinique Green Heron, *Butorides virescens maculatus* (Boddaert). Martinique Island, Lesser Antilles.

St. Lucia Green Heron, *Butorides virescens lucianus* Oberholser. St. Lucia Island, Lesser Antilles.

Barbados Green Heron, *Butorides virescens barbadensis* Oberholser. Barbados Island, Lesser Antilles.

Grenada Green Heron, *Butorides virescens grenadensis* Oberholser. Grenada Island to St. Vincent Island, Lesser Antilles.

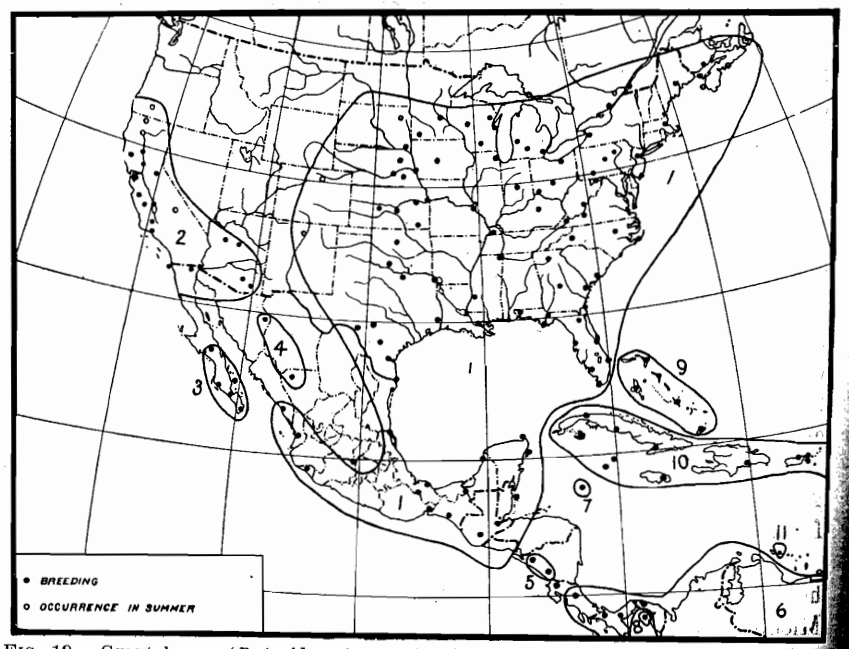

FIG. 19.—Green heron (*Butorides virescens*). Subspecies: 1, *virescens;* 2, *anthonyi;* 3, *frazari;* 4, *eremonomus;* 5, *mesatus;* 6, *hypernotius;* 7, *saturatus;* 8, *margaritophilus;* 9, *bahamensis;* 10, *cubanus;* 11, *curacensis;* seven other subspecies are on as many islands of the Lesser Antilles.

Tobago Green Heron, *Butorides virescens tobagensis* Oberholser. Tobago Island, Lesser Antilles.

Curaçao Green Heron, *Butorides virescens curacensis* Oberholser. Curaçao Island, off the coast of Venezuela.

[**Lembeye Green Heron.** *Butorides brunescens* (Lembeye).

Resident in Cuba and the Isle of Pines.]

[**Striated Heron.** *Butorides striata* (Linnæus).

A resident species occurring commonly in northern South America south to Peru and Argentina. The only record north of South America is that of a specimen taken May, 1904, on the savanna of Panama (Thayer and Bangs).]

Black-crowned Night Heron. *Nycticorax nycticorax naevius* (Boddaert).

Range.—The black-crowned night heron, including all of its various forms, is one of the most widely distributed of birds. In the

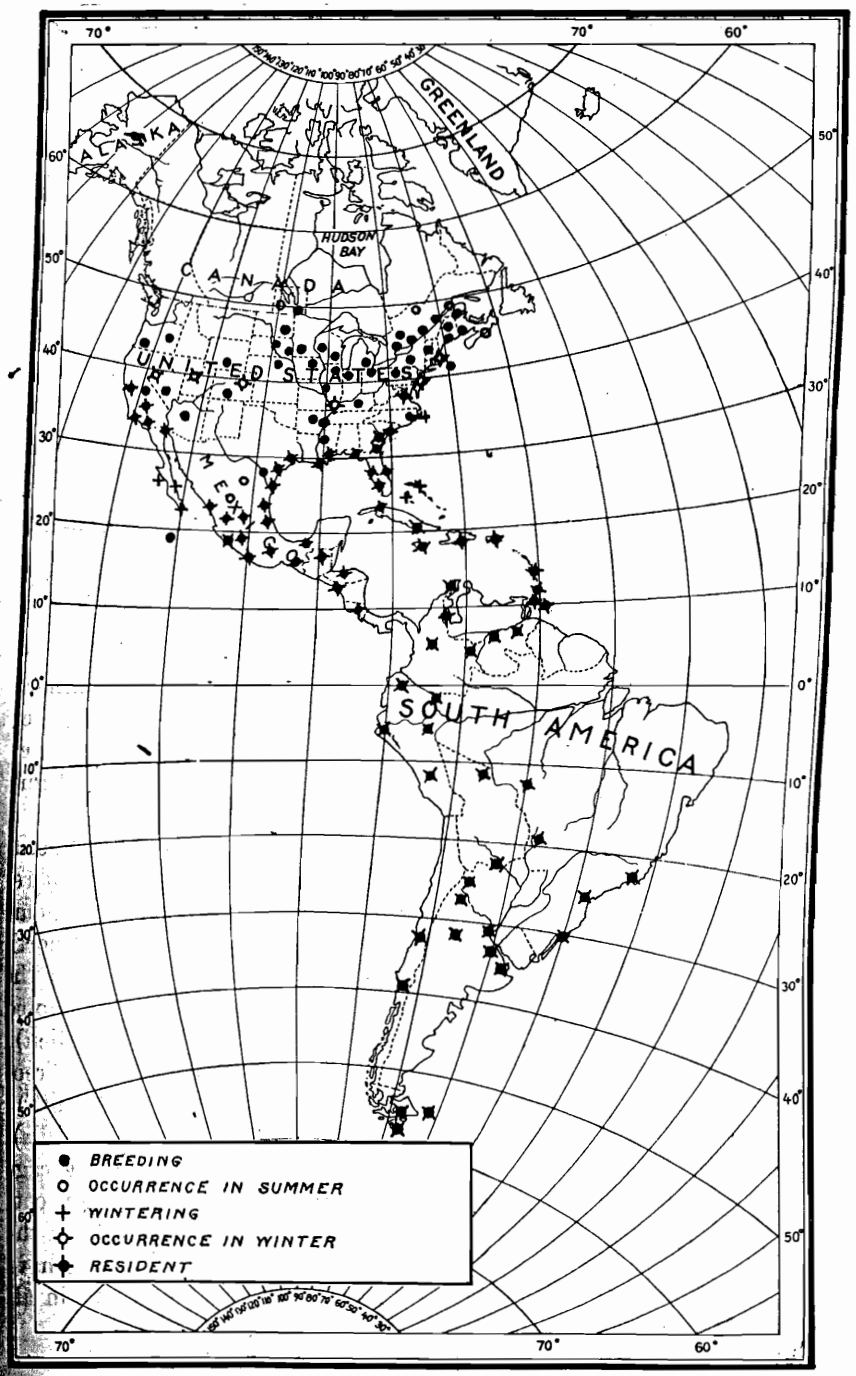

FIG. 20.—Black-crowned night heron (*Nycticorax nycticorax naevius*).

Eastern Hemisphere it occurs throughout Africa and north to southern and central Europe and thence east across Asia to China and Japan. The subspecies *naevius* occupies nearly the whole of the Western Hemisphere, north to southern Canada and south to Patagonia.

Breeding range.—The black-crowned night heron breeds north to Woodstock, N. B. (Adney); Quebec City, Canada (Dionne); Ottawa, Ontario (White); Toronto, Ontario (Nash); Rochester, Mich. (Bretherton); Oak Center, Wis. (Hatch); Lake Andrew, Minn. (Skoglund); Shoal Lake, Manitoba (Gunn); Sterling, Colo. (Cary); Laramie, Wyo. (Knight); Bear Lake, Utah (Bailey); Ruby Valley, Nev. (Bailey); and Willows, Oreg. (Bailey). Stragglers have been noted north to Halifax, N. S., about November 18, 1888, and July 4, 1889 (Austen); St. John, N. B., January 5, 1887 (Chamberlain), and April 20, 1888 (Banks); Mount Stewart, Prince Edward Island (MacSwain); Gaspe, Quebec, July 14, 1881 (Brewster); Lake Mistassini, Quebec, August 6, 1885 (Macoun); near Burks Falls, Ontario, May, 1899 (Fleming); 140 miles west of Winnipeg, Manitoba (Talbot); Portland, Oreg., July 29, 1908 (Jewett); and Douglas County, Wash., early June, 1906 (Bowles).

The breeding range includes Mexico, Central America, the whole of South America south to the Falkland Islands (Wagler) and southern Patagonia (Oustelet), the Greater Antilles, several of the Lesser Antilles—Granada (Sharpe), Trinidad (Leotaud), St. Christopher (Cory), St. Vincent (Sharpe), Tobago (Jardine), and Antigua (Cory)—and the Hawaiian Islands (Henshaw).

Winter range.—Throughout the larger part of its extensive breeding range, the black-crowned night heron is nonmigratory, but it retires for the winter from much of its United States summer home and occurs at that season in Florida, the entire Gulf coast, and north on the Atlantic coast to Pea Island, N. C. (Bishop), and on the Pacific slope to Marysville, Cal. (Belding). A few have been noted in winter in Bermuda (Hurdis); at Cambridge, Mass. (Allen); Providence, R. I. (Billson); Shelter Island, N. Y. (Griffing); Trenton, N. J. (Abbott); Anna, Ill. (Butler); Barr Lake, Colo. (Smith); Provo Lake, Utah (Yarrow and Henshaw); and Fallon, Nev. (Mills). The Zoological Park at Washington, D. C., has a large flying cage in which many black-crowned night herons live all the year outdoors. A year or two after this was built, herons appeared on the outside as well as the inside of the cage, and these wild birds have become rather common through the summer and a few remain all winter.

Spring migration.

Place.	Number of years' records.	Average date of spring arrival.	Earliest date of spring arrival.
Philadelphia, Pa. (near)	9	Apr. 22	Feb. 15, 1902
Morristown, N. J.	3	Apr. 22	Apr. 19, 1885
New Providence, N. J.	3	Apr. 10	Mar. 23, 1884
New York, N. Y. (near)	8	Apr. 16	Mar. 4, 1895
Hartford, Conn.	7	Apr. 9	Mar. 28, 1902
Providence, R. I.	6	Apr. 6	Mar. 17, 1907
Southeastern Massachusetts	9	Apr. 24	Mar. 28, 1893
Monadnock, N. H.	.....	.....	Apr. 11, 1902
Portland, Me.	.....	.....	Apr. 18, 1906
Quebec City, Canada	3	Apr. 14	Apr. 10, 1905
Rodney, Miss.	2	Mar. 24	Mar. 22, 1884
St. Louis, Mo.	3	Apr. 22	Apr. 20, 1886
Urbana, Ill.	2	Mar. 31	Mar. 26, 1904
Rockford, Ill.	.....	.....	Apr. 5, 1890
Chicago, Ill.	9	Apr. 23	Apr. 8, 1894
Sandusky, Ohio	3	Apr. 16	Apr. 14, 1902
Ottawa, Ontario	2	Apr. 24	Apr. 18, 1894
Grinnell, Iowa	3	Apr. 17	Apr. 8, 1887
Forest City, Iowa	.....	.....	Apr. 3, 1897
Heron Lake, Minn.	9	Apr. 12	Apr. 6, 1890
East-central Kansas	5	Apr. 19	Apr. 15, 1907
Eastern Nebraska	5	Apr. 22	Apr. 2, 1904
Larimore, N. Dak.	.....	.....	May 1, 1893
Denver, Colo. (near)	5	Apr. 25	Apr. 21, 1906

As would be expected from a species with such an extended range, the eggs are deposited at widely different times in different parts of the breeding range. While eggs are most commonly found in Chile during the months of October and November (Germain), in Cuba, the eggs are usually deposited in April and May (Gundlach); San Mateo, Fla., March 29, 1882 (specimens in U. S. National Museum); Alachua County, Fla., April 18, 1890 (Pearson); Charleston, S. C., April 25, 1908 (Wayne); Charleston, S. C., April 7, 1910 (Wayne) (unusually early); Mattamuskeet Lake, N. C., April 30, 1908 (Pearson); Baltimore, Md., April 30, 1892 (Gray); Syracuse, N. Y., May 14, 1881 (Rich); Portland, Conn., April 17, 1872 (Merriam); Essex County, Mass., May 12, 1896 (Mann); Penobscot Bay, Me., May 26, 1897 (Knight); Philo, Ill., May 12, 1902 (Hess); Manawa Lake, Iowa, May 15, 1904 (Trostler); near San Francisco, Cal., April 21, 1904 (Finley).

Eggs were just hatching April 13, 1895, at Tallahassee, Fla., which must have been laid in March (Williams); young just out of the nest June 20, 1903, at Falmouth, Me. (Norton); young in nest September 15, 1901, at Alameda, Cal. (Cohen); full-grown young April 23, 1878, at Lomita, Tex. (Sennett). The average date of finding eggs at Barr Lake, Colo., was May 12, earliest May 9, 1909, but young in nest May 24, 1907, indicated that some eggs had been laid at a still earlier date (Rockwell).

Fall migration.

Place.	Number of years' records.	Average date of the last one seen.	Latest date of the last one seen.
Philadelphia, Pa. (near)	3	Oct. 23	Nov. 7, 1893
New York, N. Y. (near)	4	Oct. 8	Oct. 17, 1904
Hartford, Conn			Oct. 11, 1888
Providence, R. I	4	Oct. 24	Nov. 22, 1908
Southeastern Massachusetts	6	Oct. 10	Nov. 6, 1890
Durham, N. H			Oct. 1, 1900
Portland, Me			Sept. 16, 1907
Montreal, Canada	4	Sept. 13	Oct. 11, 1895
Quebec City, Canada			Oct. 15, 1894
Chicago, Ill	7	Sept. 23	Oct. 20, 1906
Ottawa, Ontario	9	Oct. 13	Oct. 27, 1894
Delavan, Wis	2	Sept. 23	Sept. 24, 1894
Heron Lake, Minn			Nov. 14, 1885
Richmond, Kans			Oct. 15, 1885
Lincoln, Nebr			Oct. 27, 1900
Huron, S. Dak			Oct. 18, 1887
Sioux Falls, S. Dak			Nov. 20, 1910
Barr Lake, Colo	2	Oct. 7	Oct. 11, 1908

[**Agami Heron.** *Agamia agami* (Gmelin).

A nonmigratory species ranging west to Palenque, Chiapas (Nelson and Goldman), and to Rio Coatzacoalcos, Vera Cruz (Sumichrast). It is rare and local in British Honduras, Guatemala, and Costa Rica, more common in Panama, and has a wide range in northern South America, south to Yurimaguas, Peru, and to Matto Grasso, Brazil.]

Yellow-crowned Night Heron. *Nyctanassa violacea* (Linnæus).

Range.—Temperate and tropical America, north to South Carolina, Illinois, Kansas, and Lower California; south throughout the West Indies and Central America to Brazil and Peru.

Breeding range.—The yellow-crowned night heron is a common breeding bird in Florida and the lower parts of the Gulf States. On the Atlantic coast it breeds north to Charleston, S. C. (Wayne). It nests much farther north, however, in the Mississippi Valley even at the mouth of the Illinois River (Widmann); to Mount Carmel, Ill. (Nelson); Bicknell, Ind. (Chansler); Crooked Creek, Kans. (Goss); Fort Reno, Okla. (Merrill); Gurley, Tex. (Howell); and Laredo, Tex. (Butcher). The northern limit of the breeding range on the Pacific coast is found at Mazatlan, Sinaloa, at Magdalena Bay, Lower California, and on Socorro Island. The species is a common breeder in the Bahamas and the West Indies, and less commonly and somewhat locally throughout Central America and northern South America south to Paranagua, Brazil (Pelzeln); and Tumbez, Peru (Taczanowski).

Winter range.—The yellow-crowned night heron seems to desert the United States during the winter, though an injured bird spent the winter of 1909–10 at Upper Matecumbe Key, Fla. (Brodhead), and two birds were seen during January, 1912, near Brownsville,

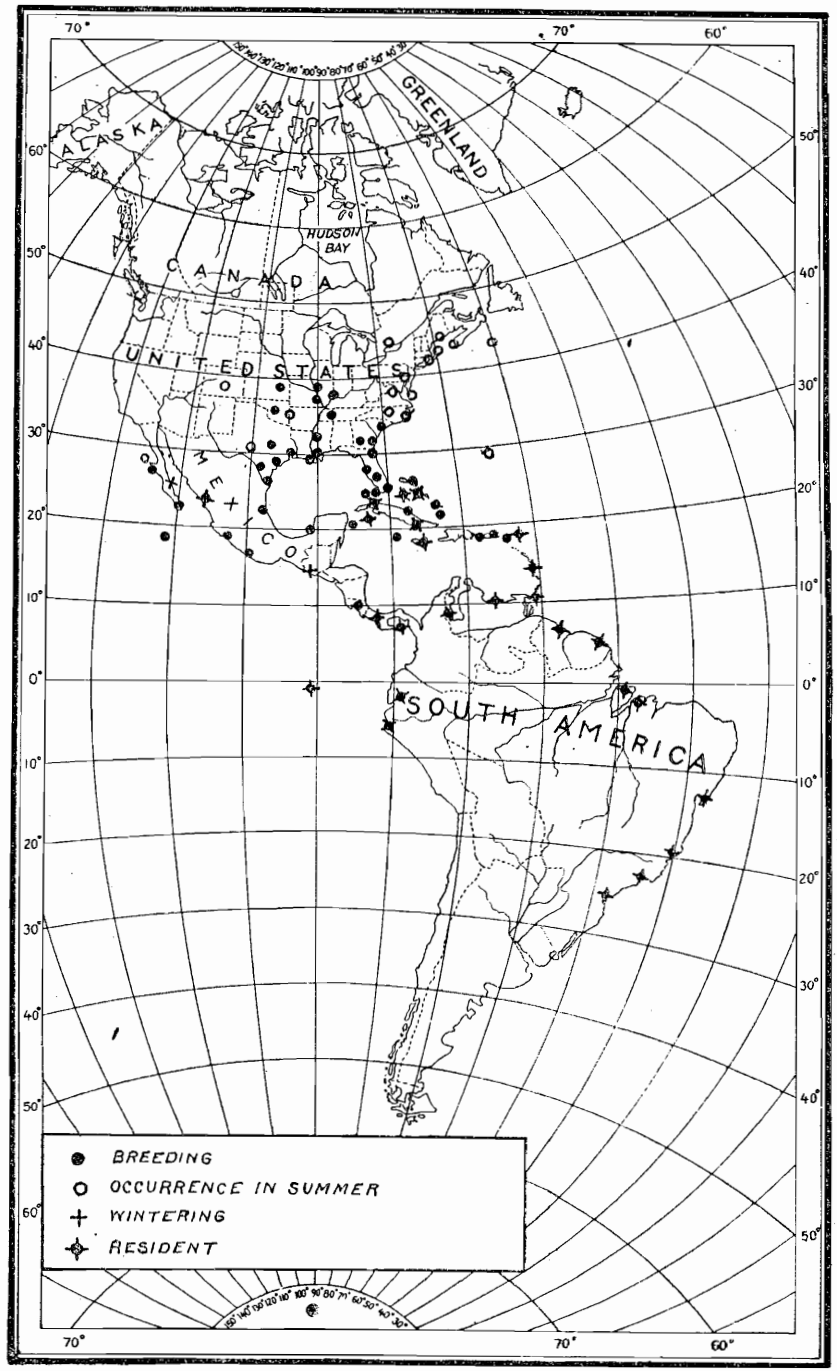

FIG. 21.—Yellow-crowned night heron (*Nyctanassa violacea*).

Tex. (Smith). It winters, however, in Cuba (Gundlach); Andros Island, Bahamas (Bonhote); Santa Ana, Vera Cruz (Ferrari-Perez); Mazatlan, Sinaloa (Lawrence); and La Paz, Lower California (Brewster).

Spring migration.—The earliest migrants reached Catfish Creek, Polk County, Fla., February 14, 1901 (specimen in U. S. National Museum); Savannah, Ga., March 28, 1909 (Perry); Charleston, S. C., average March 25, earliest March 23, 1907 (Wayne); New Orleans, La., average March 19, earliest March 9, 1895 (Allison); Rodney, Miss., average March 25, earliest March 20, 1890 (Mabbett); St. Louis, Mo., April 10 (Hurter); Bicknell, Ind., April 13, 1908 (Chansler); Corpus Christi, Tex., March 8, 1877 (Sennett); Galveston, Tex., March 20, 1892 (Lloyd); Dallas, Tex., March 28, 1898 (Mayer); Crooked Creek, Kans., April 17, 1878 (Goss).

The yellow-crowned night heron is apt to appear in districts north of the breeding range, as shown by the following records: Bermuda, April, 1848, September, 1849 (Hurdis); Raleigh, N. C., June 25, 1894 (Brimley); Cobb Island, Va. (Rives); Washington, D. C., August, 1901 (Palmer); Woodbine, N. J., May 23, 1892 (Stone); Freeport, N. Y., April, 1893 (Dutcher); Bellport, N. Y., 1897 (Babson); Wading River, N. Y., April, 1901 (Hoffman); Orient, N. Y., May 4, 1905 (Braislin); Newport, R. I., June 15, 1778 (Howe); Tiverton, R. I., April 23, 1886 (Howe and Sturtevant); Lynn, Mass., October, 1862 (Allen); Provincetown, Mass., March 8, 1891 (Small); Deering, Me., April 13, 1901 (Brock); Portland, Me., April 11, 1906 (Norton); Hawk Point, N. S., late March, 1902 (Kennard); Sable Island, N. S., April 13, 1904 (Bontelier); Toronto, Ontario, August 15, 1898 (Williams); near Council Bluffs, Iowa, May 10, 1843 (Audubon), and May 1, 1892 (Trostler); Sabula, Iowa, September 15, 1892 (Giddings); Beatrice, Nebr., July 19, 1901 (Swenk); Florence Lake, Nebr., August 23, 1903 (Trostler); Salida, Colo., May 1, 1908 (Warren).

The above dates indicate that at the time of the spring migration it is no rare thing for individuals of this species to journey farther north than they usually breed. These birds probably return in a few days to the normal breeding range, and then in July and August a second northward migration of a smaller number of individuals occurs after the breeding season.

Eggs are deposited in December in Brazil (Euler); San Miguel Island, Panama, March 14, 1904 (Thayer); Grenada, W. I., April and May (Wells); Cuba, April and May (Gundlach); Port Henderson, Jamaica, June 12, 1890 (Field); near Passage Key, Fla., April 18, 1906 (Pearson); Alachua County, Fla., April 25, 1888 (Pearson); Charleston, S. C., April 20, 1896 (Wayne); Wheatland, Ind., April 27, 1881 (Ridgway); Mount Carmel, Ill., May 6, 1874 (Nelson); Nueces County, Tex., May 22, 1884 (Benners); Socorro Island, Mexico, fledged young May 14, 1897 (Anthony). An unusually early nesting was that of birds which had already laid their eggs by March 23, 1907, at Charleston, S. C. (Wayne), while the eggs that were found hatched March 5, 1890, at Key West, Fla., must have been laid in early February.

[**Lineated Tiger-bittern.** *Tigrisoma lineatum* (Boddaert).

The lineated tiger-bittern ranges north to Panama, where it has been taken at Lion Hill, March, 1900 (Brown), and at Rio Indio, February 23, 1911 (Goldman). Thence it spreads over much of northern South America, south to Peru (Pebas and Yurimaguas) and to Barretos, Sao Paulo, Brazil.]

[**Nicaraguan Tiger-bittern.** *Tigrisoma excellens* Ridgway.

Restricted to Middle America, where it has been taken from the Segovia River, Honduras (Townsend), to the Rio Escondido, Nicaragua (Richmond).]

[**Mexican Tiger-bittern.** *Heterocnus mexicanus* (Swainson).

The Mexican tiger-bittern is one of the common members of the family in Mexico and Central America and ranges north almost to the United States, to Alamos, Sonora; Victoria, Tamaulipas; and Cozumel Island, Yucatan. The southern limit is found in Panama, where it has been taken east to the Bay of Panama (Kellett and Wood) and to the line of the Panama Railroad (McLeannan).]

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