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THE RANGE OF THE SNAIL KITE AND ITS HISTORY IN FLORIDA

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UNIVERSITY OF FLORIDA

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THE RANGE OF THE SNAIL KITE AND ITS HISTORY IN FLORIDA

PAUL W. SYKES, JR.¹

ABSTRACT: A study of the status, distribution, life history, and ecology of the Snail (Everglade) Kite (*Rostrhamus sociabilis plumbeus*) was conducted in Florida beginning in the fall of 1967 and completed at the end of December 1980. This paper covers the distributional aspects of the study.

Taxonomists have generally recognized four subspecies of *Rostrhamus sociabilis*, but more recently Amadon (1975) concluded that the birds in Florida and Cuba are inseparable, and he assigned *levis* of Cuba to *plumbeus*. This paper follows that opinion.

The ranges of the Snail Kite and its subspecies are presented in four range maps based on a thorough review of the literature and information supplied by ornithologists working in or visiting various parts of the Western Hemisphere.

The total range in Florida is mapped in detail. The original and present (1968–1980) ranges in Florida are presented. The present range was found to be about 9% of the original. The legal descriptions of localities used by kites during the 1968–1980 period are listed in Appendix 2.

Records of the Snail Kite from 1844 through 1980 in the United States cover its occurrence at 80 localities in Florida, 1 in Georgia, and 3 in Texas. The Florida localities are numbered and shown in Figure 15. The localities are grouped under 12 natural drainage systems, 3 regions, and 6 political divisions. The listing of records is as complete as possible.

The range and historical data for Florida were obtained from a review of the literature, a thorough search for preserved material in museum and private collections in the United States, Canada, Mexico, and Europe, field observations throughout the state by the author from the fall of 1967 through the end of December 1980, and the assistance of co-operators. Curated collections that were found to have no kite materials from Florida are listed in Appendix 1. A complete list of preserved Snail Kite material originating from Florida is found in Appendix 3. These include 159 skins and mounts, 148 egg sets, and 1 skeleton. There appears to be no fluid (whole) specimen of the Snail Kite for Florida. Information listed in Appendix 3 includes locality at which the material was collected, date, catalog number, curatorial institution, and sex. The number of skins and egg sets at each curatorial institution are listed in Table 1. Kites have been recorded in 33 Florida counties.

During 1968–1980, the most important areas in Florida for the Snail Kite were the marsh on the west side of Lake Okeechobee (Fig. 9) and the eastern and southern sectors of Conservation Area 3A (CA3A) (Fig. 13). Habitats in these two areas should be maintained to insure their continued suitability for this species.

RESUMEN: Un estudio del status, distribución, ciclo de vida y ecología del gavilín caracolero (*Rostrhamus sociabilis plumbeus*) fue realizado en Florida entre el comienzo del otoño del 1967 y el final de diciembre de 1980. Este artículo cubre aspectos distribucionales de dicho estudio.

Generalmente, los taxónomos reconocen cuatro subespecies de *Rostrhamus sociabilis*, pero mas recientemente, Amadon (1975) concluyó que hay sólo tres subespecies; dado

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que los gavilanes de Florida y Cuba son inseparables, él asignó el *levis* de Cuba a la subespecie *plumbeus*. Este artículo es favorable a esta opinión.

Las áreas de distribución del gavilán caracolero y sus subespecies están representadas en cuatro mapas basados en una detallada revisión de la literatura e información proporcionada por ornitólogos trabajando en o visitando diferentes regiones del Hemisferio Occidental.

La distribución del gavilán caracolero en Florida ha sido trazada en un mapa en detalle. La distribución original y presente en Florida es mostrada. La distribución presente se estimó como aproximadamente un 9% de la original. Las descripciones legales de las localidades usadas por los gavilanes durante el período 1968–1980 se enumeran en el Apéndice 2.

Registros del gavilán caracolero desde 1844 hasta 1980 en los Estados Unidos indican su presencia en 80 localidades en Florida, 1 en Georgia y 3 en Texas. Las localidades en Florida se numeran en la Figura 15 y se agrupan en 12 sistemas naturales de drenaje, 3 regiones y 6 divisiones políticas. El listado de los registros es lo más completo posible.

La distribución y datos históricos en Florida fueron obtenidos en base a una revisión de la literatura, una cuidadosa investigación de material preservado en museos y colecciones privadas en los Estados Unidos, Canadá, México y Europa, observaciones de campo a través del Estado por el autor desde el otoño de 1967 hasta el final de diciembre de 1980 y la ayuda de colaboradores. Las colecciones en las que no se encontraron gavilanes caracoleros de Florida se listan en el Apéndice 1. En el Apéndice 3 se presenta una lista completa del material preservado oriundo de Florida. El material incluye 159 plumajes y montajes, 148 juegos de huevos y 1 esqueleto. Apparently no existen especímenes en pie del gavilán caracolero en Florida. La información listada en el Apéndice 3 incluye la localidad en la que el material fue coleccionado, fecha, número de catálogo, institución a cargo y sexo. El número de plumajes y huevos en cada institución se lista en el Cuadro 1. Los gavilanes caracoleros han sido registrados en 33 condados de Florida.

Durante el período 1968–1980, las áreas de Florida más importantes para el gavilán caracolero fueron el pantano del lado oeste del Lago Okeechoe (Fig. 9) y los sectores este y sur del Area de Conservación 3A (CA3A) (Fig. 13). Los hábitats en estas dos áreas deberían ser preservados para así garantizar que sigan siendo adecuados para esta especie.

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INTRODUCTION

The Snail Kite (*Rostrhamus sociabilis plumbeus* Ridgway) in the United States is for the most part unique to Florida. It is a medium-sized raptor, about 43 cm in length with a wingspread of 115 cm, that inhabits freshwater marshes and ranks among the most specialized of raptorial birds in its food requirements. The greatly decurved, narrow, sharp-tipped upper mandible is highly adapted for extracting the soft parts of snails from their shells (Sykes 1978). In Florida the kite feeds almost exclusively on the freshwater apple snail (*Pomacea paludosa*) (Sykes and Kale 1974), which is available to the birds only when the marshes are flooded. Because of drainage and other modifications to its habitat, the kite population has declined since the early 1900's.

Adults of the species are sexually dimorphic, with females slightly larger than males. The adult male is slate gray with black wing tips. The square tail is black with a large white patch at its base and a narrow white terminal band. The unfeathered soft parts of the adult male are orange-red and become more intense during the breeding season. The eyes of adults are red and immatures brown. The females and immature males are brown and buffy above with the underparts white to buffy and heavily streaked with dark brown. The tail pattern of the brown-plumaged birds is similar to that of the adult male. The color of the soft parts of all females and immature males ranges from yellow to orange.

The Snail Kite, unknown to William Bartram, Alexander Wilson, and John Audubon, was first found in Florida 29 April 1844 by Edward Harris (1844) when he collected an immature male near the headwaters of the Miami River. C. J. Maynard secured the type specimen for the subspecies *plumbeus* at this same general locality 25 March 1871 (Baird et al. 1874, Deignan 1961). Many specimens and eggs have been collected, and numerous sight records exist for localities scattered over the peninsula and in the Gulf Coastal Bend region. Many of these data have never been published and are summarized here for the first time. A complete list of specimens from Florida is presented in Appendix 3, and the sight records are included in the historical section.

Howell (1932) was the first to detail the species' distribution in the United States. He stated that it bred in Florida from the southern tip of the peninsula northward to Panasoffkee and Crescent lakes and listed a number of localities for which there were breeding records as well as other known occurrences. Some 20 years later Alexander Sprunt, Jr. (1954) believed that practically the entire population was confined to the southwestern part of Lake Okeechobee. Stieglitz and Thompson (1967) briefly summarized kite distribution for the early and mid 1960's. Howell (1932)

and these authors cited the steady loss of habitat that began in the early 1900's. This situation resulted in a substantial reduction of the population and a corresponding decrease in the range. The Snail Kite in Florida was declared endangered in 1966 by the U. S. Fish and Wildlife Service (Committee on Rare and Endangered Species 1966). Because of this critical status, a study was begun to document what had taken place in the past, what was happening at present, and how the problems might be solved. Some of the results of this study are presented here. Other papers dealing with aspects of the kite's life history and ecology are in preparation.

From 1967 through 1980, I made a thorough search of museum collections, examined the literature for all available information on Snail Kites, conducted annual censuses, and made detailed field observations. The field work also included an aerial survey of most freshwater marshes of the peninsula and the Gulf Coastal Bend region. On-site inspections were made in the most promising habitats. Observations and field assistance by cooperators supplemented my field efforts. I visited 16 museum collections in the United States to examine kite specimens from Florida. Curators of an additional 126 private and public collections were contacted by letter in the United States, Canada, Mexico, and Europe. Unpublished data were obtained from the files of governmental agencies, educational institutions, private organizations, and from the field notebooks of individuals.

This publication describes: (1) The range of the *Rostrhamus sociabilis* and its subspecies in the world; (2) the original range of the species in Florida; (3) the present range in Florida; (4) the historical record in Florida by specific localities within their respective hydrological system, region, or political division; and (5) a listing of all known skins, mounts, skeletons, and egg sets from Florida.

Abbreviations used for curatorial institutions are in Table 1.

Since 1981, the Loxahatchee National Wildlife Refuge has been the clearinghouse for all Snail Kite sightings in Florida. Anyone seeing a Snail Kite should report the sighting to: Loxahatchee National Wildlife Refuge, Route 1, Box 278, Boynton Beach, FL 33437. Telephone: AC 305 732-3684. All sightings should include the date, locality (be as specific as possible), name(s), mailing address(es), and telephone number(s) of observer(s), description of the appearance of the kite, the number of individuals seen, type of optics, if any, used to view the kite, was it photographed, habitat in which the kite was observed, what was it doing when seen (perched, flying, soaring, hunting, etc.), estimated distance of bird from the observer, and any other relevant data. These types of information are essential to determine the reliability of each record.

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THE RANGE THE SUBSPECIES AND THEIR DISTRIBUTION

The Snail Kite, *Rostrhamus sociabilis* (Vieillot), of the Family ACCIPITRIDAE, Subfamily MILVINAЕ (true kites), is a wide-ranging New World species found primarily in lowland freshwater marshes in tropical and subtropical America from Florida, Cuba, and Mexico south to Argentina and Peru (Fig. 1). Except for Cuba and Trinidad, it is absent from the islands of the Caribbean (Friedmann 1950).

Hellmayr and Conover (1949) and Friedmann (1950) recognize four subspecies: (1) the Florida Snail Kite, *R. s. plumbeus* Ridgway; (2) the Cuban Snail Kite, *R. s. levis* Friedmann; (3) the Mexican Snail Kite, *R. s. major* Nelson and Goldman; and (4) the Southern Snail Kite, *R. s. sociabilis* (Vieillot). For descriptions of these see Friedmann (1950). The plumages of the subspecies are the same, and bill, wing, and tarsus measurements overlap considerably (Friedmann 1950). Recently Amadon (1975) reexamined the taxonomic status of the four subspecies and concluded that *plumbeus* and *levis* are not distinct. He synonymized *levis* with *plumbeus*, with which I agree. As size is the only character distinguishing the subspecies (Hellmayr and Conover 1949, Friedmann 1950) and the measurements exhibit overlap, the separation of this species into subspecies is still open to question. For example, the birds of Honduras currently assigned to the subspecies *sociabilis* are intermediate in size between the South American *sociabilis* and *major* and measure about the same as *plumbeus* (Monroe 1968).

FLORIDA SNAIL KITE (*R. s. plumbeus*)

R. s. plumbeus is found locally in peninsular Florida (Howell 1932, Hellmayr and Conover 1949, Friedmann 1950). It is locally common in Cuba (Fig. 2) at Artemisa, San Cristobal, Lake Ariguanabo, Lake Solis, Lake Tesoro, the Zapata marshes, and the lower Cauto River Basin, and rather rare in the Lanier Marshes and at Santa Rosalia on the Isle of Pines (Barbour 1943, Hellmayr and Conover 1949, Friedmann 1950, Bond 1956, Schwartz and Klinilowski 1963, Garrido and Montaña 1975, Albert Schwartz pers. comm.). Of an estimated population of 50 to 100 Snail Kites at Lake Guama in the Zapata Marsh region, 28 were seen at one time in mid-June 1978 (James F. Clements pers. comm.). Distribution of this form in Florida is treated in detail in the next section.



Figure 1.—The range of the Snail Kite (*Rostrhamus sociabilis*).

MEXICAN SNAIL KITE (*R. s. major*)

R. s. major (Fig. 3) is local in eastern and southern Mexico in the states of Veracruz, Tabasco, Campeche, Oaxaca, Chiapas, and Quintana Roo (Hellmayr and Conover 1949, Friedmann 1950, Blake 1953, Binford

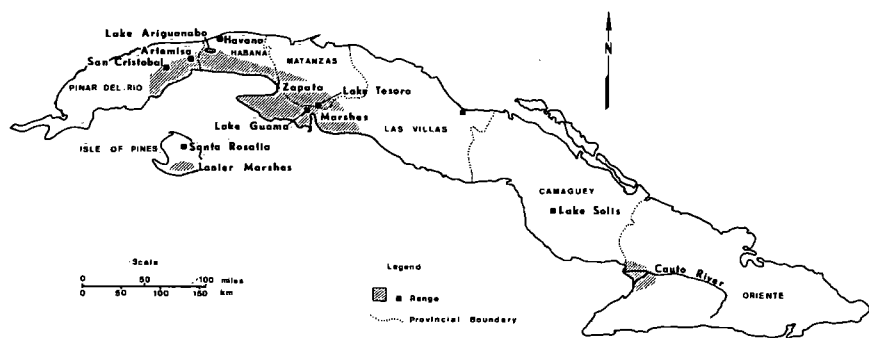


Figure 2.—The range of *Rostrhamus sociabilis plumbeus* in Cuba.

1968, Edwards 1972, Peterson 1973, John C. Ogden pers. comm.); in Belize from New River and Hill Bank Lagoon south to Stann Creek (Russell 1964); and in Guatemala in the Peten District and at Panzos (Hellmayr and Conover 1949, Friedmann 1950, Land 1963, 1970).



Figure 3.—The range of *Rostrhamus sociabilis major* in Mexico, Guatemala, and Belize. Suitable kite habitat is very local in much of the region shown.

SOUTHERN SNAIL KITE (*R. s. sociabilis*)

R. s. sociabilis is scarce in Central America in Honduras, Nicaragua, Costa Rica, and Panama (Fig. 4). In Honduras it is known from Laguna Toloa and Lake Yojoa (Hellmayr and Conover 1949, Friedmann 1950, and Monroe 1968); in Nicaragua at Rivas, Isla de Ometépe, Río San Juan del Norte, and Los Sábalos (Hellmayr and Conover 1949, Friedmann 1950, Thomas R. Howell pers. comm.); in Costa Rica on the lower Río Frío Drainage, in the Tempisque Basin primarily in the Guanacaste Marshes near Bebedero and Palo Verde, on the upper Nicoya Peninsula at Bolson and Santa Cruz, and on the Osa Peninsula (Hellmayr and Conover 1949, Friedmann 1950, Slud 1964, Collett 1977, Paul Slud pers. comm.); and in Panama at Permé (Griscom 1932, Hellmayr and Conover 1949, Friedmann 1950, Wetmore 1965, Ridgely 1976), with recent records at Gualaca and Tocumen and breeding near Remedios (Ridgely 1976).

R. s. sociabilis is common locally throughout South America (Fig. 1) south to Peru, Bolivia, Paraguay, central Argentina, and Uruguay and east to Trinidad and eastern Brazil (Hellmayr and Conover 1949, Friedmann 1950, John P. O'Neill pers. comm.). It has not been recorded from the Guyana Massif nor the Brazilian Plateau. In Colombia it is found in the tropical lower Magdalena Basin and generally east of the Andes (but local), and rarely to the temperate zone of the marshy highland basin at Bogota, Cauca Valley at Lago de Sonso near Cali, and Remedios (Friedmann 1950, Steven L. Hilty pers. comm.). In Ecuador it has been recorded west of the Andes at Yaguachi marshes near Guyaquil, at Babahoyo, and Vices and east of the Andes along the Río Napo (Hellmayr and Conover 1949, Friedmann 1950, John P. O'Neill pers. comm.). In northeastern Peru it is reported from Pebas (Friedmann 1950) and in the Department of Loreto at Yarinacocha (John P. O'Neill pers. comm.). In Venezuela, it is found in the tropical zone from Zulía and Apure east to Delta Amacuro and to the south bank of the Orinoco River in northern Bolívar; and it probably occurs throughout the country in suitable habitat (Hellmayr and Conover 1949, Friedmann 1950, Meyer de Schauensee and Phelps 1978). It occurs in Trinidad as a rare visitor at Nariva Swamp and Caroni Marshes (Hellmayr and Conover 1949, Friedmann 1950, French 1973). It is found commonly in the coastal lowlands of Guyana (Hellmayr and Conover 1949, Friedmann 1950, Noel F. R. Snyder pers. comm.), Surinam (Hellmayr and Conover 1949, Friedmann 1950, Haverschmidt 1968), and French Guiana (Hellmayr and Conover 1949, Friedmann 1950).

R. s. sociabilis is found generally throughout Brazil, except on the Brazilian Plateau. It is widespread in the Amazon basin as well as from the latitude of Cuiabá in Mato Grosso southward, and in the lowlands of

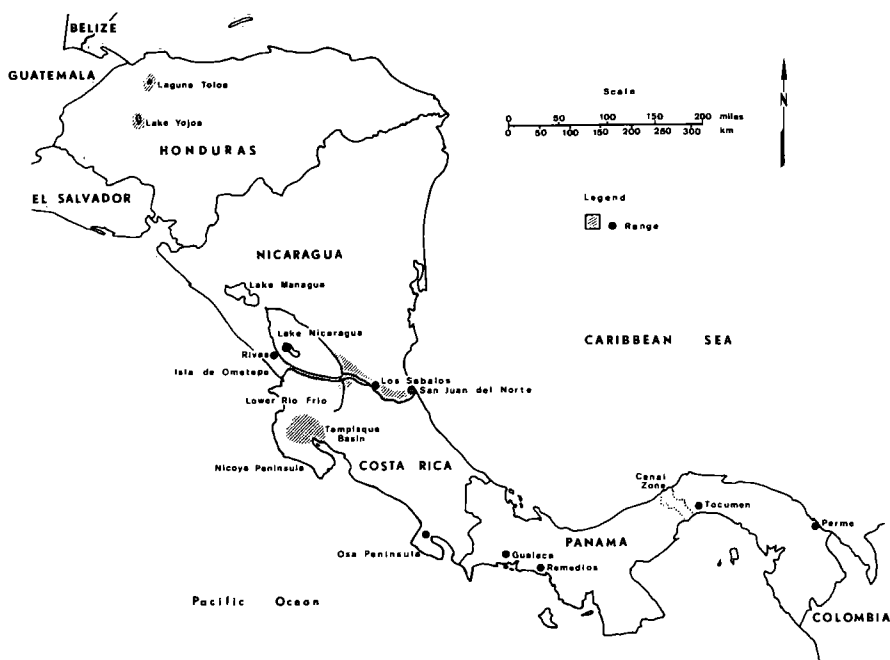


Figure 4.—The range of *Rostrhamus sociabilis sociabilis* in Middle America. Suitable kite habitat is very local in much of the region shown.

the southeastern coast (Hellmayr and Conover 1949, Friedmann 1950). In Bolivia it is found in the departments of Beni and Santa Cruz, in Paraguay in the eastern two-thirds of the country, and throughout much of Uruguay (Hellmayr and Conover 1949, Friedmann 1950, John P. O'Neill pers. comm.). In Argentina, it occurs in the provinces of Formosa, Chaco, Santiago del Estero, Tucuman, Cordoba, Santa Fe, Misiones, Corrientes, Entre Rios, and Buenos Aires (Hellmayr and Conover 1949, Friedmann 1950), where it is reported to be extremely abundant in the northeastern part of the province (Susan Allen, Paul G. DuMont, and Theodore A. Parker pers. comm.).

RANGE AND HISTORY IN FLORIDA

This section contains most of the records of the Snail Kite in Florida, from its discovery in 1844 through 1980, as documented by preserved catalogued materials in museum collections, published accounts in the literature, and sight records judged reliable.

Preserved Snail Kite materials from Florida are housed in 36 collections in four countries; 32 in the United States, 2 in Canada, and 1 each

in England and the Union of Soviet Socialist Republics. The known extant materials, totaling 308 units, are listed in Table 1. This material includes 159 skins and mounts, 148 egg sets, and only 1 skeleton; I am not aware of the existence of any fluid (whole) specimens from Florida. I feel that I have located most of the existing kite materials originating from the state. Curated collections with no Snail Kite material from Florida are listed in Appendix 1.

ORIGINAL RANGE IN FLORIDA

The range of the Snail Kite in Florida prior to 1910 is shown in Figure 5. The principal areas included: (1) The lower Wacissa River in Jefferson County (Wayne 1895); (2) Lake Panasoffkee in Sumter County (Scott 1881); (3) the upper reaches of the St. Johns River from Volusia and Lake counties southward to the headwaters in southern Brevard, Indian River, and northwestern St. Lucie counties; (4) the Kissimmee River Valley from Osceola County south to northern Glades and southwestern Okeechobee counties; (5) the west (Glades Co.) and south (Hendry and Palm Beach cos.) sides of Lake Okeechobee; (6) the Caloosahatchee River drainage from north-central Lee County upstream to Lake Hicpochee (Glades and Hendry cos.); (7) the Loxahatchee Slough and West Palm Beach area south to Lake Ida in Delray Beach in eastern Palm Beach County; (8) the Everglades from the west, south, and east sides of Lake Okeechobee south to the mangrove forest at the southern end of the peninsula, west of the Atlantic coastal ridge and east of the Big Cypress, and including parts of Glades, Hendry, Palm Beach, Broward, Collier, Monroe, and Dade counties; (9) Okaloachoochee Slough in Hendry and Collier counties; and (10) the marshes in Collier and Monroe counties to the southwest of the Big Cypress and inland of the mangrove forest.

Additional places from which kites were recorded from 1910 to 1967 (black triangles in Fig. 5) include the Wakulla River, Wakulla County (Howell 1932, Stevenson 1951a, b); St. Marks N. W. R., Wakulla County (Stoddard 1950); Micanopy, Alachua County (Swann 1934); Emeralda Marsh, Lake County (Howell 1932); Chassahowitzka River, Citrus County (Howell 1932); vicinity of Jacksonville, Duval County (Boardman 1884, Grimes 1944); near Crescent Lake, Putnam County (Howell 1932); Lake Norris, Lake County (Howell 1932); Sebastian River, Brevard and Indian River counties; southern Indian River, St. Lucie County; Lake Butler (= Lake Tarpon), Pinellas County; Manatee County; Sarasota, Sarasota County (Stevenson 1955a); DeSoto County; and Ft. Myers, Lee County.

Other areas in the peninsula where kites probably occurred (?s in Fig. 5), but for which evidence is lacking, are the Orange and Lochloosa lakes region (Micanopy is in the vicinity) in southeastern Alachua County; the

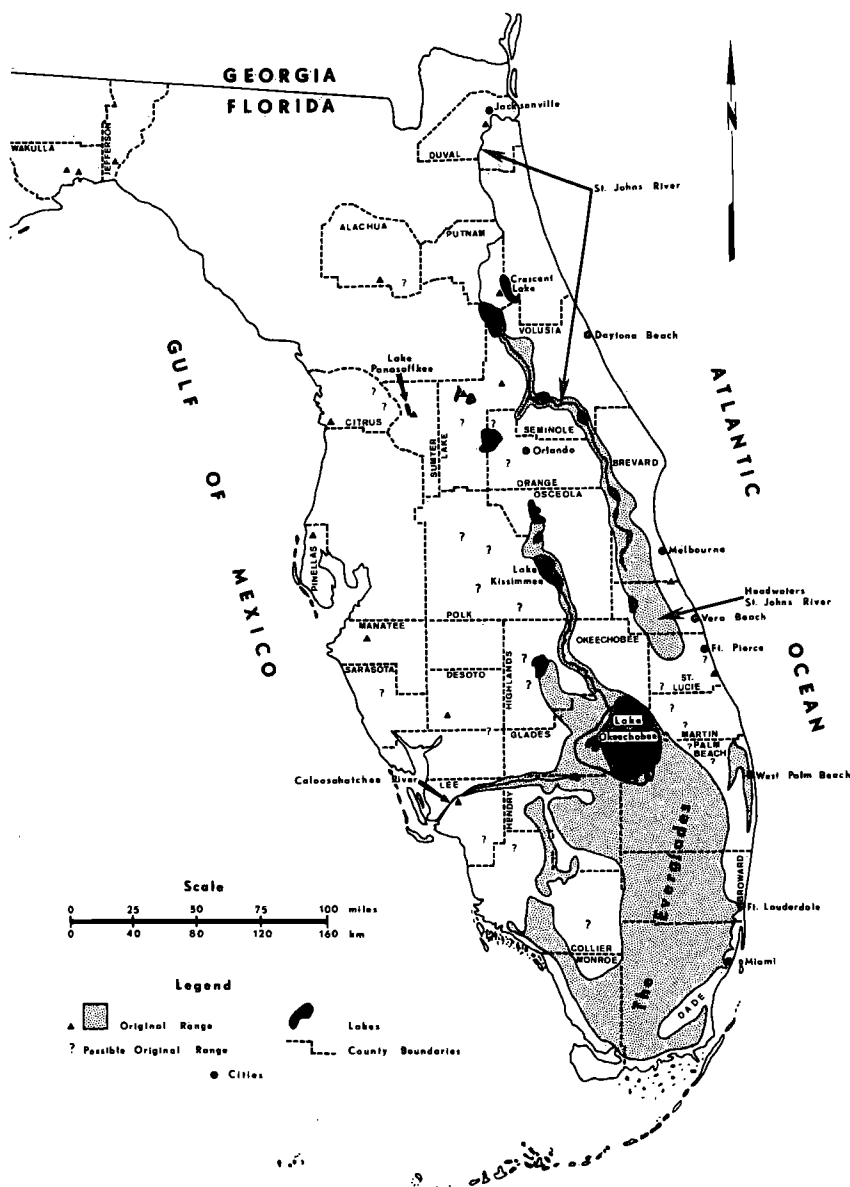


Figure 5.—The original range of the Snail Kite (*Rostrhamus sociabilis plumbeus*) in Florida. Selected counties are shown with their present boundaries.

Lake Tsala Apopka region of eastern Citrus County; the numerous lakes in southern Lake, throughout Orange and Polk, and northwestern Highlands counties; the marsh on the north side of Lake Apopka, Lake and

Orange counties, near the present town of Zellwood; the Myakka River (area within the present Myakka River State Park), southeastern DeSoto County; the Corkscrew Marsh, Lee and Collier counties; the small sloughs scattered through the Big Cypress region; the Savannas in eastern St. Lucie County; the Allapattah Flats of southwestern St. Lucie, western Martin, and northcentral Palm Beach counties; and the Hungryland Slough in northern Palm Beach County between Loxahatchee Slough and the northeastern part of the Everglades.

Kites have been recorded in 33 Florida counties (Table 2). This listing is based on present county boundaries. Some of the boundaries have changed over the years as new counties were established from parts of the older counties (Whitefield 1975). Between 1844 and 1949, kites were recorded in 33 (49%) of the 67 counties of Florida. From 1950 through 1967 they were reported in only 10 (15%) of the counties, and from 1968 to 1980 the birds were observed in 16 (24%) of the counties.

Details of the nesting distribution for the kite in Florida are incomplete. Howell (1932:168) gave the following general account of the former breeding range: "Breeds locally in the southern and central parts, north (formerly) to Panasoffkee Lake and Crescent Lake. Recorded from the Wacissa River and probably bred in that vicinity. Recently it has been found nesting on the Wakulla River. The birds formerly bred and wintered abundantly in many parts of the Everglades, but at present they are restricted to a few localities that are unaffected by drainage operations."

The single breeding record for the Gulf Coastal Bend is on the Wakulla River (Howell 1932). On the peninsula, the northernmost breeding record is at Micanopy, Alachua County (Swann 1934). In the north-central peninsula, kites were thought to nest in Emeralda Marsh, Lake County (Howell 1932). Howell (1932) listed breeding at Lake Panasoffkee, Sumter County, and at Crescent Lake, Putnam County. For the latter, the label of an egg set at the U. S. National Museum gives the locality "near Crescent City." This town lies on the west side of the lake. I am unaware of the evidence of actual breeding at Lake Panasoffkee other than the fact that at least 22 specimens (9 males, 12 females, and 1 unsexed) were collected there in February and March 1876 (Appendix 3). With this number of birds present during the breeding season, one could reasonably assume nesting in the vicinity. The species has also been reported breeding at Lake Norris, Lake County.

Kites were known to nest extensively along the upper St. Johns River and its headwaters (Nicholson 1926, Howell 1932). This included the marsh south of Lake Washington, Brevard County, south through Indian River County into northwestern St. Lucie County. That part of the St. Johns Marsh in the vicinity of Fellsmere and that west of Vero Beach,

both in Indian River County, were particularly well known nesting areas. At least 42 egg sets were collected on the headwaters (Appendix 3).

All nesting activity at Lake Okeechobee has been confined to the large marsh on the west side, from the present site of the city of Clewiston north to the mouth of the Kissimmee River. This marsh is in Hendry, Glades, and Okeechobee counties. No nesting is recorded for the remainder of the lake, including Ritta, Creamer, and Torry islands on the southeastern side in Palm Beach County. At least 19 sets of eggs have been collected on the lake over the years. Kites formerly bred along the Caloosahatchee River Drainage upstream to Lake Hicpochee in Lee, Hendry, and Glades counties.

The Snail Kite formerly nested throughout the Everglades Basin and in the Big Cypress Region in Okaloachoochee Slough in Hendry, Collier, and Monroe counties (Howell 1932, Appendix 3).

Loxahatchee Slough or Marsh and the marshes that formerly existed in the West Palm Beach area of Palm Beach County were well known breeding sites. At least 23 egg sets were collected in these marshes up to the early 1920's.

Localities where kites have probably bred in the past and for which no documentation exists include the following: the Wacissa River, Jefferson County; the Lake Tsala Apopka region, Citrus County; the marsh that was formerly on the north side of Lake Apopka, Lake and Orange counties; the middle reaches of the St. Johns River in Volusia, Lake, Seminole, Orange, and northern Brevard counties; the Savannas, St. Lucie County; the Kissimmee River Valley, Orange, Polk, Osceola, Highlands, and Okeechobee counties; Allapattah Flats, St. Lucie, Martin, and Palm Beach counties; marshes along the Myakka River, Manatee and Sarasota counties; and sloughs scattered through the Big Cypress Region, mainly Collier County.

Counties having evidence of breeding in the historic past are listed in Table 2. Changes in county boundaries over the years have been considered. Kites have nested in at least 16 (24%) Florida counties, and probably in at least 11 others (Citrus, Highlands, Jefferson, Manatee, Martin, Orange, Osceola, Polk, Sarasota, Seminole, and Volusia).

PRESENT RANGE IN FLORIDA (1968–1980)

The present range of the Snail Kite in Florida (Fig. 6) is shown in detail in Figures 7 through 14. The legal descriptions of habitats currently used by kites are in Appendix 2. The estimate of the present range is based upon data obtained from 1968 to 1980 and comprises approximately 9% of the original range.

From time to time individuals are seen for short periods outside the

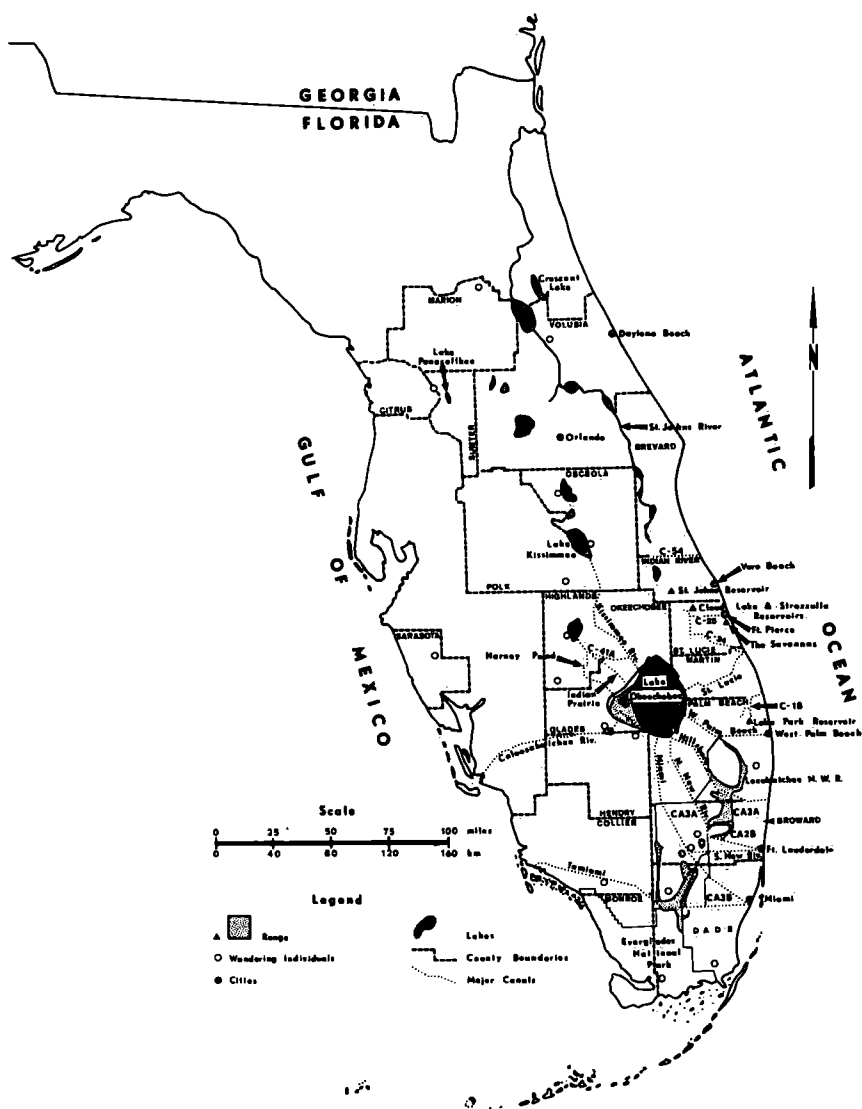


Figure 6.—The range of the Snail Kite in Florida, 1968–1980.

mapped areas but within the original range. This is particularly true following completion of nesting activities and during drought conditions. The birds in Florida are nomadic (Sykes 1978, 1979). For this reason most localities are not in continuous use and some are occupied only infrequently.

From 1950 through 1967, kites nested in 5 (7%) counties, and from

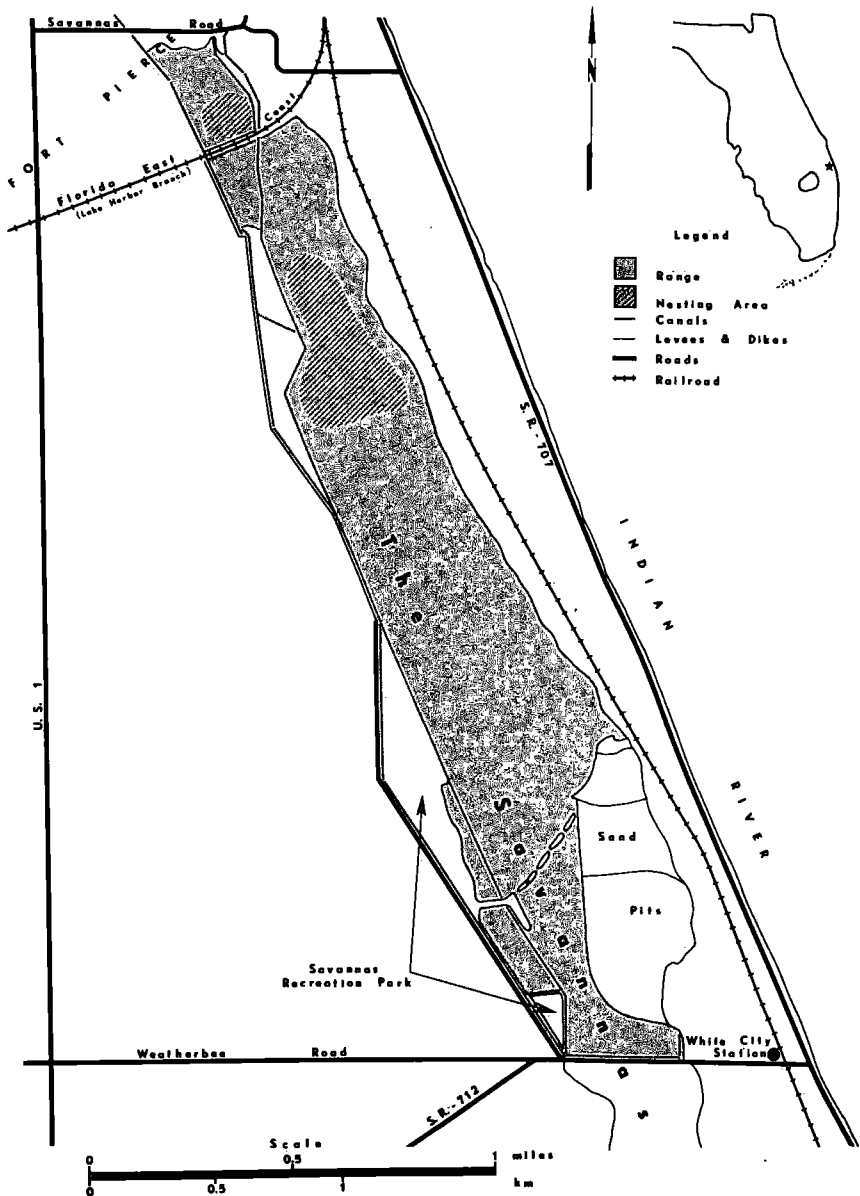


Figure 8.—Snail Kite range (1968–1980) in the northern part of the Savannas, St. Lucie County.

Reservoir (Fig. 10) in recent years, but courtship display by two males was seen there in the spring of 1977.

Nesting activity on the Loxahatchee National Wildlife Refuge (Conservation Area 1 = CA1) (Fig. 11) has been on the eastern and southern

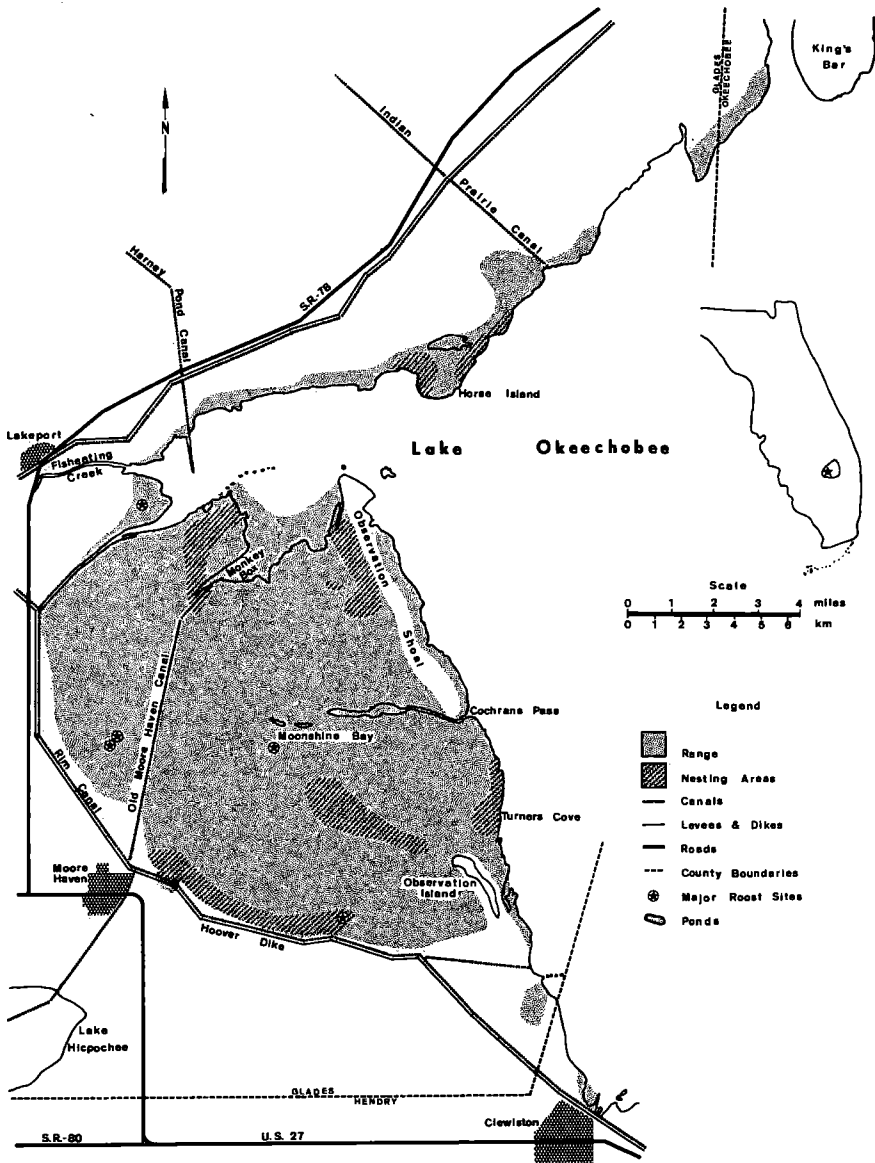


Figure 9. —Snail Kite range (1968–1980) on the west side of Lake Okeechobee in Glades, Hendry, and Okeechobee counties.

sides. Nesting activity in Conservation Area 2A (CA2A) (Fig. 12) has been in six general localities in the eastern half of the area. Most nesting is in the largest of the six in the southeast corner. An occasional nest is found outside of the six sites. Nesting in Conservation Area 2B (CA2B) (Fig.

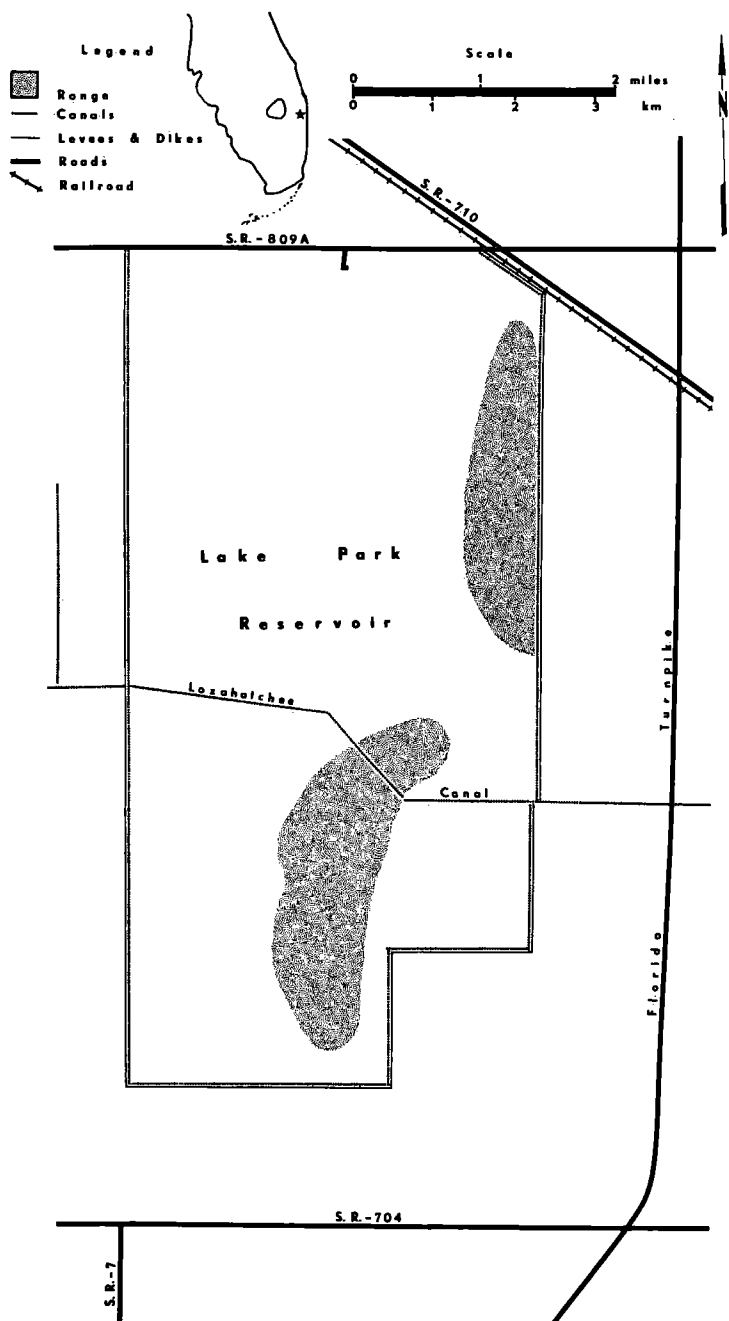


Figure 10.—Snail Kite range (1968–1980) on the Lake Park Reservoir in the Loxahatchee Slough, Palm Beach County.

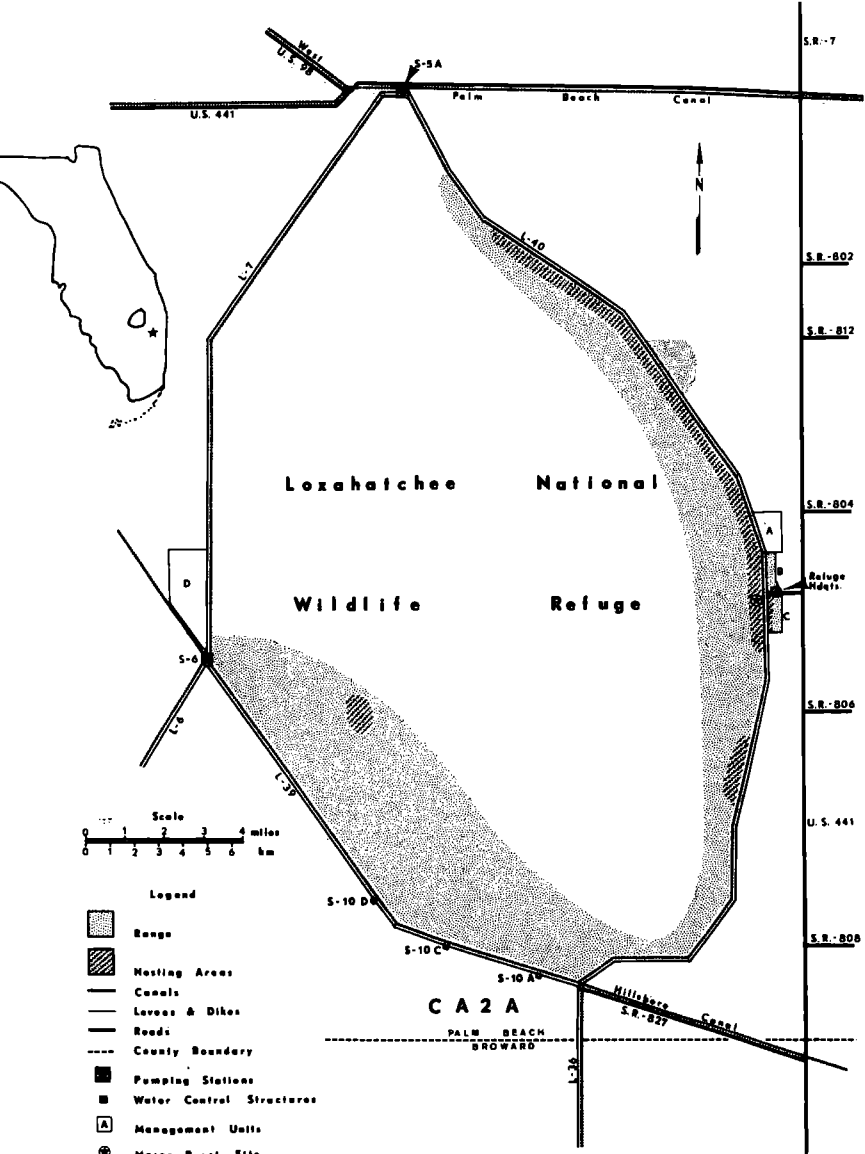


Figure 11.—Snail Kite range (1968–1980) on the Loxahatchee National Wildlife Refuge (Conservation Area 1), Palm Beach County.

12) was recorded in the southern sector within 1.25 km of the North New River Canal.

In Conservation Area 3A (CA3A) (Fig. 13) nesting is primarily west of L-67A in Dade County. Nesting is 4.5 km north of the Tamiami Trail in the southeast corner and extends northeastward along L-67A Canal for

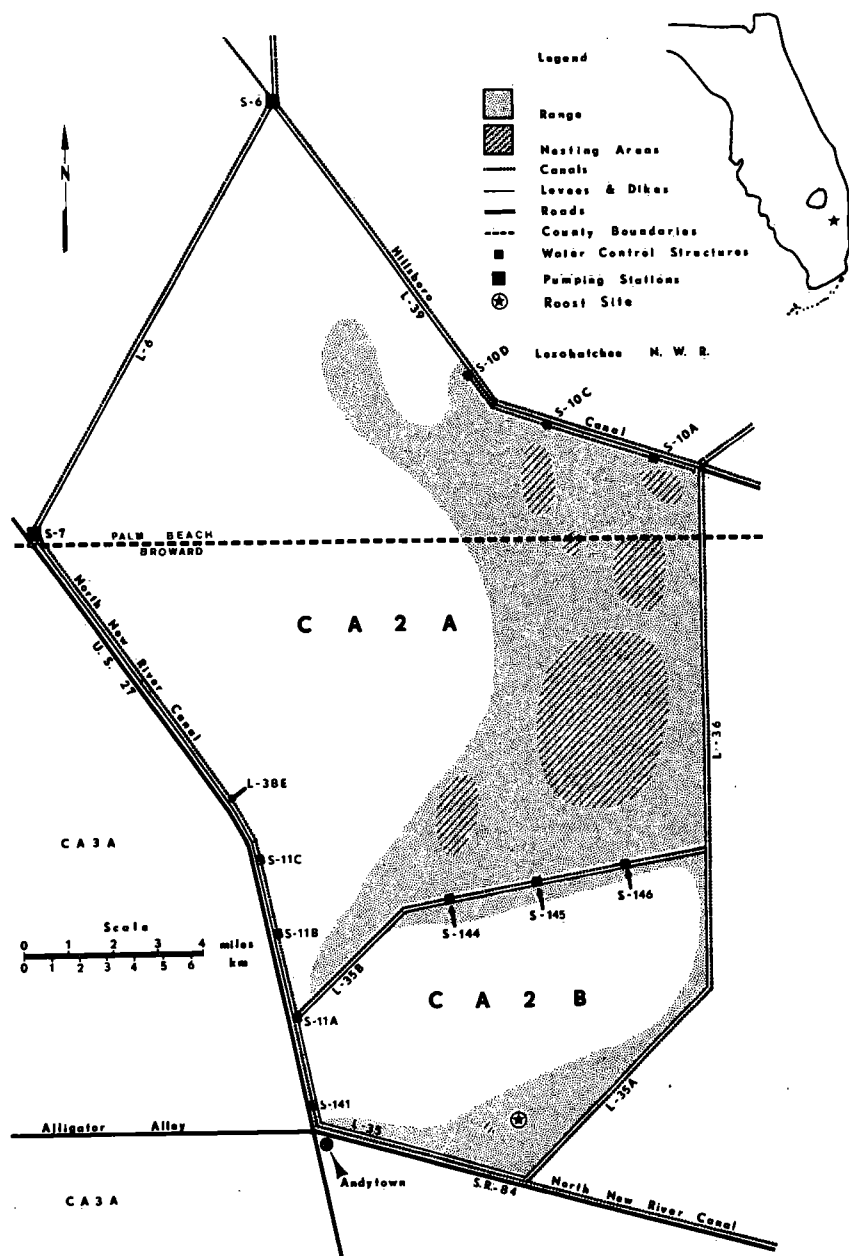


Figure 12.—Snail Kite range (1968–1980) in Conservation Areas 2A and 2B, Broward and Palm Beach counties.

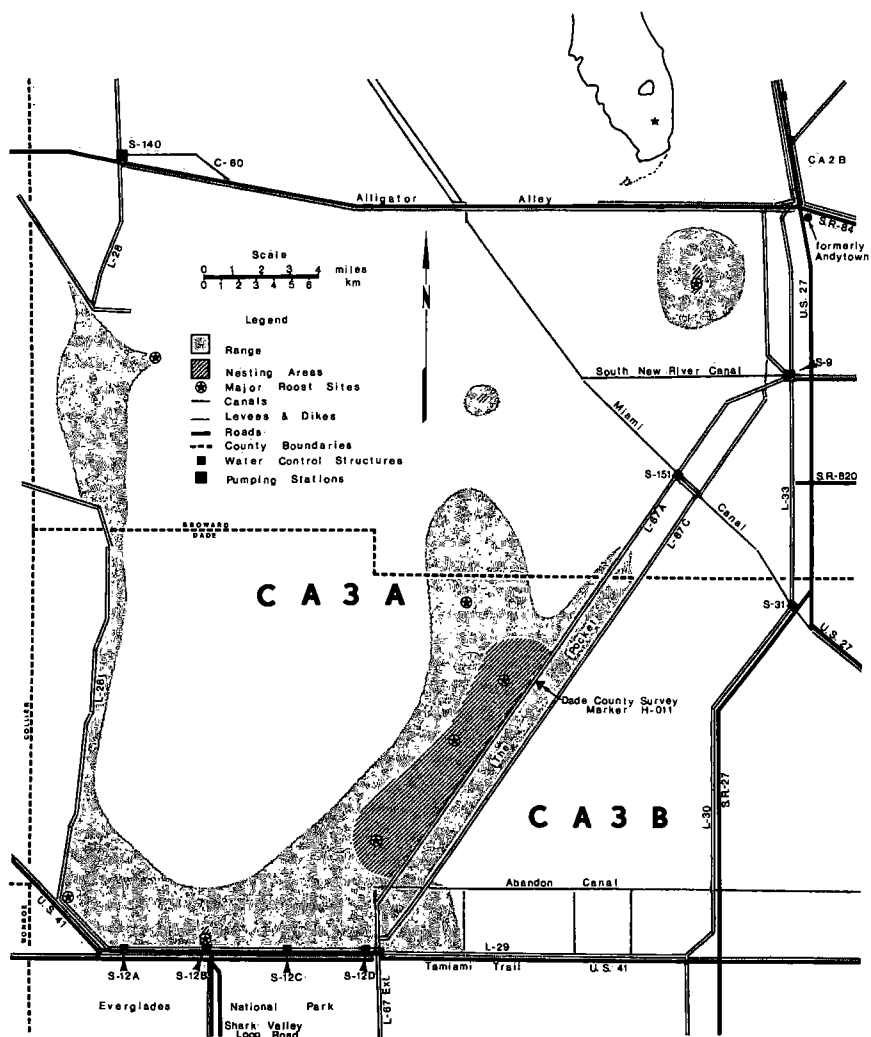


Figure 13.—Snail Kite range (1968–1980) in Conservation Areas 3A and 3B, Broward and Dade counties.

approximately 9.5 km and up to 4 km west. The southernmost nesting site is just north of the Tamiami Trail and west of the Shark Valley Loop Road entrance to the Everglades National Park. Two other nesting sites were known in Broward County; one approximately 5.6 km WSW of the intersection of the Miami and South New River Canals in T-51-S, R-37-E and the other 7.1 km SW of Andytown in T-50-S, R-39-E. CA3A together with Lake Okeechobee currently comprise the major nesting areas for the kite in Florida. No nesting activity was recorded in Conser-

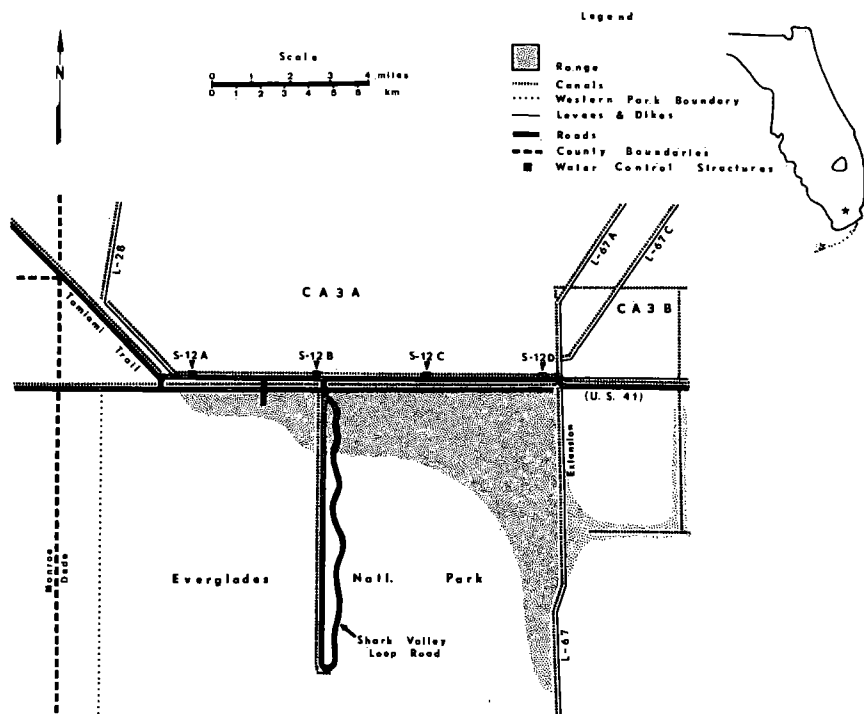


Figure 14.—Snail Kite range (1968–1980) in the northern part of the Everglades National Park (excluding Taylor Slough) and the East Everglades, Dade County.

vation Area 3B (CA3B) or the Everglades National Park (Fig. 14) during the 1968–1980 period.

THE HISTORICAL RECORD IN FLORIDA WITH SIGHTINGS ELSEWHERE IN THE UNITED STATES

In the United States the Snail Kite is generally found only in Florida, but in the last decade sightings of wandering individuals have been reported in Georgia and Texas. This section deals with specimens and sight records for the three states in which the kite is known to occur. The Florida records are treated first and comprise about 99% of the material.

The counties of origin for preserved Snail Kite material are in Table 3. Seven counties account for 86% (excluding the 46 pieces listed as State of Florida) of this material: Brevard 33 (13%), Broward and Dade-Broward 34 (13%), Dade 34 (13%), Glades 22 (8%), Indian River 35 (13%), Palm Beach 47 (18%), and Sumter 22 (8%). In some instances Broward and Dade counties have been treated as one because Broward was a part

of Dade County until 1913 (Whitefield 1975), and label data are insufficient to determine the county of origin. Lee and Hendry counties were grouped for the same reason.

Following the wane of extensive collecting in the 1920s and 1930s, sight records became more prevalent and, since then, constitute the majority of the documentation for the species' distribution in the State. Although this work by no means contains all the sight records for the kite in Florida, it incorporates most of the important sightings that are believed accurate.

The individual records for Florida are grouped by regions or natural drainage systems and, under these, by 80 localities with numbered designations. Records for each locality are listed chronologically. The reference from which each record was obtained is given with the listing. Where no reference is given the observation was made by the author. The complete reference for published records is given in the Literature Cited. Each specimen record is followed by its catalogue number and depository institution.

Prior to about 1900, the Snail Kite was probably found, at least in years when water levels were high, in nearly all freshwater marshes containing an apple snail (*Pomacea paludosa*) population from about 29°15' north latitude south throughout the peninsula of Florida to the mangrove forests at its southern tip. There are a number of gaps in our knowledge of the distribution of this species in Florida. Only relatively recent access to much of the kite habitat has been made possible by a modern road system and the development of mechanized transportation, but by then much of the original kite habitat had been lost as a result of widespread drainage. Therefore, most of the early kite records are from the periphery of the larger marshes, usually near natural water courses or along existing transportation routes. The interior of the Everglades and other vast marshes were extremely difficult to penetrate for any distance until development of the airboat with its flat bottom and air-thrust engine in the 1940s.

The localities in Florida where Snail Kites have been recorded (Fig. 15) are numbered from north to south. Localities numbered 73, 78, and 80 are not shown in Figure 15 as they refer to broad geographic regions.

GULF COASTAL BEND

1. WAKULLA RIVER. The first Snail Kite recorded on the river was a male seen hunting 0.8 km downstream from Wakulla Springs by Herbert L. Stoddard, Sr., Paul L. Errington, and Ralph King on 3 April 1929. On 9 May of that same year Stoddard and Mrs. W. D. Richardson found a nest with eggs. The two birds were last seen on 9 June 1929 (Howell

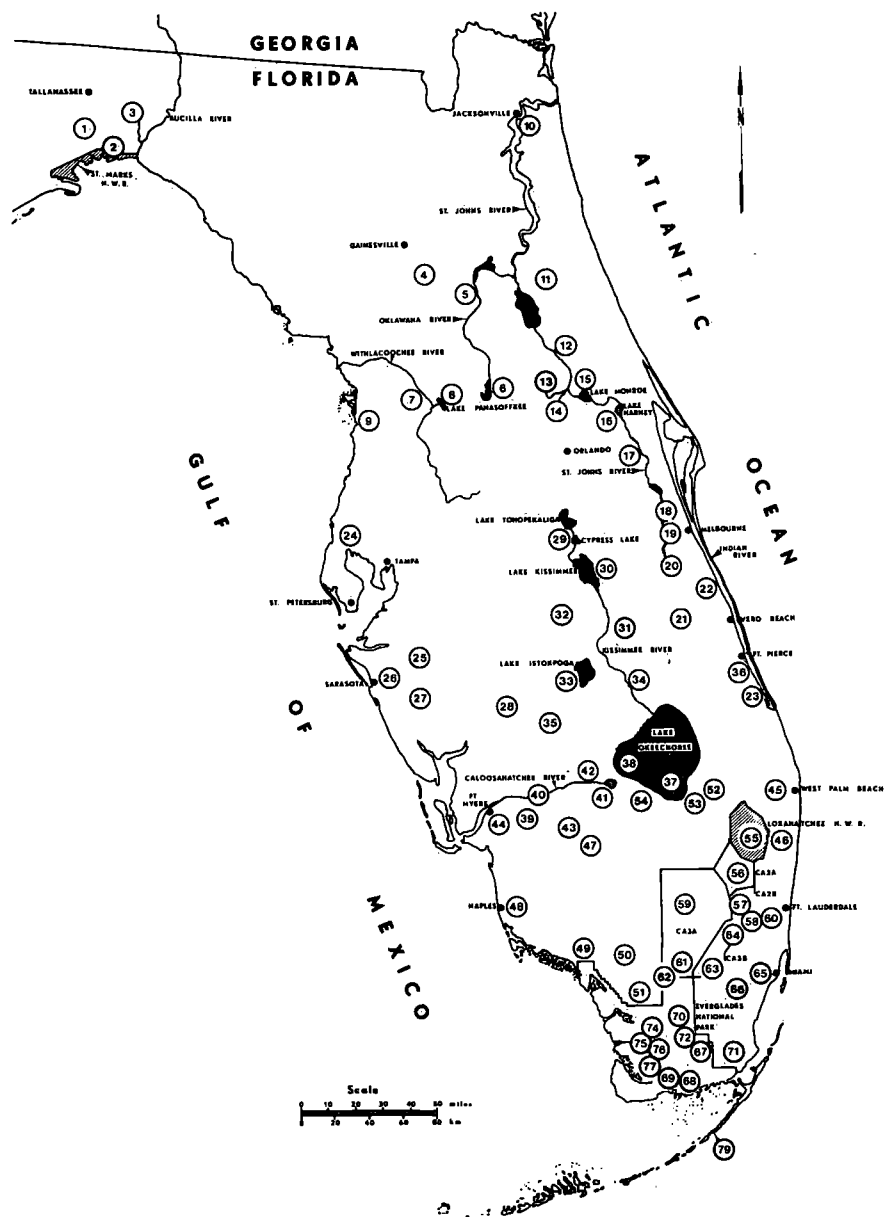


Figure 15.—Localities in Florida at which Snail Kites have been recorded. The numbering system corresponds to the localities in the text.

1932, Herbert L. Stoddard, Sr., unpubl. notes). Although visited by naturalists and birders regularly, no other birds were reported at this locality until December 1950 through early March 1951, when a lone individual (female or immature male) was seen during much of that period and recorded on the St. Marks Christmas Bird Count of 28 December (Brookfield 1951, Stevenson 1951a, 1951b, Henry M. Stevenson pers. comm.).

2. ST. MARKS N.W.R. The only records for the refuge are 3 sightings between 15 May and 18 July 1950 in Stony Bayou and vicinity (Wakulla County) by Herbert L. Stoddard, Sr., and H.L. Beadel (Stoddard 1950, unpubl. notes). This is probably the same individual that was at Wakulla Springs December 1950 to March 1951.

3. WACISSA RIVER. Arthur T. Wayne (1895) found Snail Kites to be "exceedingly common" on the Wacissa River from April through at least 21 May 1894. During this period he secured about 20 specimens. I have located 7 (3 males, 2 females, 2 unsexed) of these (Appendix 3). Major Charles E. Bendire in a letter to Wayne (1895) indicated he believed "There must be a colony of them breeding within forty or fifty miles of the Wacissa River." This was never substantiated and there appear to be no records of this species on the river since Wayne's visit in 1894.

OKLAWAHA RIVER DRAINAGE

4. MICANOPY. H. H. Simpson collected a clutch of eggs (CM 4914) at Micanopy, Alachua County, on 4 December 1919 (Swann 1934). Exactly where the nest was located in the Micanopy area is not known.

5. PAYNE'S LANDING. During the period 13 August 1971 through 7 April 1972, David Bowman (pers. comm.) noted one to two individuals near Payne's Landing, Marion County, on the Oklawaha River. These sightings were made following the severe spring drought of 1971 in southern Florida and are believed to represent wandering individuals.

6. EMERALDA MARSH. Howell (1932) saw an adult and an immature in the Emerald Marsh, northern Lake and southern Marion counties, between Lake Griffin and Lake Yale on 9 May 1925. He believed the immature was from a nest in the vicinity.

WITHLACOOCHEE RIVER DRAINAGE

7. WITHLACOOCHEE RIVER DRAINAGE. During the 1971 drought Thomas W. Martin, Jr. (pers. comm.), saw a bird on 6 May near the S. R. 44 bridge across the Withlacoochee River on the Sumter-Citrus County line. The bird's presence at this locality is believed to be a result of dispersal associated with the drought.

8. LAKE PANASOFFKEE. In February and March 1876 W. E. D. Scott (1881) found kites abundant at Lake Panasoffkee. He had 19 in view on one occasion. I have located 22 specimens (9 males, 12 females, 1 unsexed; Appendix 3) that he collected at the lake on this trip. Howell (1932) found no kites there in June 1925, nor did I on 4 May and 7-8 June 1972 and 5 June 1973. There appear to be no records at the lake since Scott's time.

CHASSAHOWITZKA RIVER DRAINAGE

9. CHASSAHOWITZKA RIVER. I could find only one record for the river, a specimen [location unknown] taken in the spring of 1918 (Howell 1932).

ST. JOHNS RIVER DRAINAGE

10. JACKSONVILLE AND VICINITY. Three specimens [present location unknown] were taken near Jacksonville in [circa February] 1884 and were to have been mounted (Boardman 1884, Grimes 1944). There have been no records for this area since that time (Samuel A. Grimes pers. comm.).

11. CRESCENT CITY AND VICINITY. An incomplete clutch of one egg (USNM 28048) in fresh condition was collected near Crescent City in 1894. This set was originally part of the William L. Ralph Collection, and the record is cited by Howell (1932).

12. LAKE WOODRUFF N.W.R. In 1968 Kent A. Meyers (pers. comm.) saw two birds in Management Unit 1 on 12 February and on 2 April. Marvin T. Hurdle, Matthew C. Perry, and I saw a lone individual along Spring Garden creek at the west end of Jones Island on 12 May 1971.

13. LAKE NORRIS. Howell (1932) reported that B. M. Kinser recorded a pair breeding on the lake in the spring of 1925. No further details concerning this record are known.

14. WEKIVA RIVER. S. F. Baird collected a male (FMNH 37652) on 2 July and a female (USNM 72815) on 5 July 1876. Brewster (1881) recorded the species at a "prairie" on the river on 19 March 1877, and a brown bird was photographed on the Seminole County side of the river by John H. Storer in company of Edward M. Davis in May 1938 (Mason 1939).

15. LAKE MONROE. G. B. Frazer collected a male (FMNH 37654) on 4 February 1883.

16. LAKE HARNEY. A pair was seen in the spring of 1957 on the Seminole County side of the lake by Hall Tennis (files of Natl. Audubon Soc., Tavernier, Fla.)

17. TOSOHATCHEE STATE RESERVE. A brown plumaged kite was seen by Robert D. Barber (pers. comm.), Ted Robinson, and others along the power line road in the northern part of the reserve on the west side of the St. Johns River, Orange County, on 21 July 1979.

18. **BREVARD COUNTY.** Four kites were collected between 5 January and 15 April 1889 and stomach contents examined (Baker 1889). I do not know if any of this material was preserved. A male (UMMZ 62039) and a female (UMMZ 62040) were collected by C. J. Pennock on 30 March 1924, and a male (MCZ 252440) was taken by J. B. Semple on 30 March 1930. No specific locality was given for this material other than the county.

19. **WEST OF MELBOURNE.** D. J. Nicholson (1926) saw 5 kites feeding along the Kissimmee-Melbourne Road (U. S. Hwy. 192) across the St. Johns River Marsh about 11 km west of Melbourne on 13 May 1925. Henry Redding collected 2 clutches of eggs (WVZ 16326, MNHOS 4797) for D. J. Nicholson on the St. Johns Marsh south of Lake Washington on 7 May 1926.

20. **ST. JOHNS MARSH.** William L. Dawson collected a clutch of eggs (AMNH 6961) on the St. Johns Marsh on 5 March 1927. Bent (1937) reported seeing 5–6 pairs and an empty nest on the St. Johns Marsh on 20 March 1930. In the spring of 1950 Nicholson (1951) watched kites that behaved as if feeding young, but no nest was found nor were young seen.

21. **HEADWATERS OF THE ST. JOHNS RIVER.** Howell (1932:169) stated that in the spring of 1923 kites were "... breeding in considerable numbers in various parts of the big marsh near the headwaters of the St. Johns River in Brevard and St. Lucie Counties" [also Indian River County]. In May of that year 7 specimens (3 males, 2 females, 2 unsexed juveniles) were collected 16 km west of Malabar (Appendix 3). From April 1925 through May 1931, 39 clutches of eggs and 14 specimens (11 males, 3 females) were taken, mainly in the vicinity of Fellsmere. According to D. J. Nicholson 12 pairs were breeding in the marshes near Fellsmere in late April 1925 (Howell 1932). Joseph C. Howell (pers. comm.) found kites to be numerous on the St. Johns in 1927, and that year Arthur H. Howell (1932) listed about 30 nests in the area. In 1928 and 1929, no kite nests were found on the headwaters marsh, but in 1931, 5 pairs nested in the area (Joseph C. Howell pers. comm.).

With the completion of State Road 60 from Vero Beach to Yeehaw Junction across the headwaters of the St. Johns River in 1931, sightings and nesting activity were recorded in that portion of the marsh. From 1932 through 1935, 6 nests were located, one nestling and 2 egg sets were collected, and several sightings were made in the vicinity of Route 60. There were no reports from this area again until March and April 1951, when 20+ kites were observed and 2 young seen flying about and being fed by adults on 13 April 1951 (Nicholson 1951). A lone individual was seen 22.5 km west of Vero Beach along Route 60 in November 1960 (Mason 1965).

Since the spring of 1969, kites have been seen regularly at the St. Johns, Cloud Lake, and Strazulla reservoirs. In the spring of 1972, Herbert W. Kale, II, and I found a nest in the St. Johns Reservoir and saw

up to 19 birds. In 1973 there were 2 nests in Strazzulla and 4 in St. Johns reservoirs; in 1974, 4 nests in St. Johns, 3 in Cloud Lake, and 1 in Strazzulla; and in 1975, 1 nest in Strazzulla. No nests were found on the St. Johns in 1976, and the region was not checked thoroughly from 1977 through 1980. No kites were recorded in the area on annual censuses from 1974 through 1980.

INDIAN RIVER DRAINAGE

22. SEBASTIAN RIVER. A male was collected by W. F. Henninger on the river on 28 March 1898 and is now mounted (OSM 5443).

23. INDIAN RIVER. A female (ROM 35683) was taken on the southern part of the river in the summer of 1874.

PINELLAS COUNTY

24. TARPON SPRINGS. W. S. Dickerson collected an adult male (ANSP 45611) at Lake Butler [=Lake Tarpon] on 10 May 1895.

MANATEE COUNTY

25. MANATEE COUNTY. A male (MCZ 226057) was taken on 19 December 1886 and a female (FMNH 37651) the following day somewhere in Manatee County.

SARASOTA COUNTY

26. SARASOTA. Virginia Thier (*vide* Charles Preston) observed a kite at Sarasota, 20–27 November 1954 (Stevenson 1955a).

27. MYAKKA RIVER STATE PARK. Walter J. Kenner (pers. comm.) reported a kite on the north side of Rookery Road and about 3 km east of the park drive on 26 February 1969. An adult male was seen perched on a fencepost 2–3 km east of the park along S.R. 72 on 24 August 1979 (Robert L. Dye and Ken C. Alvarez pers. comm.).

DESOTO COUNTY

28. DESOTO COUNTY. A male and female (BMNH 1890–4–28–249 and 1890–4–28–250) were taken by W. R. Dean somewhere in DeSoto County on 8 March 1888. DeSoto County was formed from eastern Manatee County in 1887, and in 1921 it, in turn, was divided to form the present counties of DeSoto, Charlotte, Glades, Hardee, and Highlands. The labels on the two specimens list only DeSoto County, so the specific locality at which they were collected within the five-county region is unknown.

KISSIMMEE RIVER VALLEY

29. **LAKE TOHOPEKALIGA AND VICINITY.** A female (USNM 151034) was collected on 18 February 1895 by O. Tollin in the Lake Tohopekaliga and Cypress Lake area, Osceola County. Tollin also collected a male (USNM 151035) at Little Marsh, Osceola County, on 10 May of that year and another male (USNM 151033) in the vicinity of the lakes on 30 May. I am not aware of any records in this area again until E. Bostleman's report of a bird at Lake Tohopekaliga 1–30 March 1975 (Stevenson 1975).

30. **LAKE KISSIMMEE.** A bird was seen at Rabbit Island in late May 1973 by Kenneth Morrison (Joseph D. Carroll, Jr., pers. comm.). On 24 November 1980, James A. Rodgers, Jr., and I observed one kite along the northeast shore on the annual kite census.

31. **KISSIMMEE PRAIRIE.** Fargo (1934) reported a specimen taken on the prairie by Walter J. Hoxie in November 1888 [exact collection locality and present whereabouts of specimen unknown].

32. **LAKE ARBUCKLE.** Wilson (1971) reported a kite on the south shore of Lake Arbuckle in southern Polk County on 27 May 1971.

33. **LAKE ISTOKPOGA.** In June 1972, Katherine and Miriam Beck sighted a kite in the marsh on the west shore of the lake and took photographs (Kodachromes FK4289–4299 Archbold Biol. Sta., Lake Placid, Florida, James N. Layne pers. comm.). Another was seen at the same place in December 1973 by Miriam Beck (Fred E. Lohrer pers. comm.).

34. **KISSIMMEE RIVER.** A Mr. Riggs collected a female (FMNH 37653) on the river in February 1888. No further details on the collecting site are known.

35. **DESOTO PRAIRIE.** Hugh V. Hines (pers. comm.) saw a kite near the Blue Head Ranch in southwestern Highlands County, south of S.R. 70 from a low flying plane, in early November 1967.

THE SAVANNAS

36. **THE SAVANNAS.** Ruth E. Young (pers. comm.) saw a male kite at the north end of the Savannas on 2 and 9 June 1974. An adult male was seen by Helen and William Dowling and others, just north of Midway Road at Ft. Pierce from 29 to 31 March 1977 (Gloria Hunter pers. comm.). The Dowlings and I saw four birds in the north end of the Savannas on 6 and 13 May 1977. On 6 May we saw one or more fledglings being fed in the marsh by one pair, but the nest was not located. Two kites were seen on the annual census of 16 November 1977, and three were recorded on the census of 6 December 1978. Helen and William Dowling (pers. comm.) found an active nest approximately 100 m north of the Lake Harbor branch of the Florida East Coast Railroad track on 13 January 1979, and on 26 January the nest contained an undetermined number of small young being

fed. No kites were found on the annual census in 1979, but a brown bird was recorded on 25 November of the 1980 census.

LAKE OKEECHOBEE

37. **EAST SIDE OF LAKE OKEECHOBEE.** From 22 January until 1 April 1957, Glenn Chandler observed up to 4 kites in the vicinity of Kreamer and Torry islands (files of Nat. Audubon Soc., Tavernier, Fla.) on the southeastern side of the lake. I am not aware of any other Snail Kite records on the east side.

38. **WEST SIDE OF LAKE OKEECHOBEE.** The earliest record of the kite at the lake was in November 1884, when a male (FMNH 130047) was collected. This specimen was originally in the Bishop Collection and the collector is unknown. The first nest with eggs was found on 20 April 1906 (SBCM 9631). From 1906 through 1913, 2 specimens (female, MVZ 6518, male MVZ 6517) and 6 sets of eggs were taken on the lake (Appendix 3).

No kites were reported from the lake after May 1913 until late January 1938. This hiatus in the records may be the result of a lack of ornithological work in that part of the lake occupied by the species rather than their absence for that 24-year period. Alexander Sprunt, Jr., began routine observations in the region in 1935 that continued until 1963, generally from October through April (Alexander Sprunt, IV, pers. comm.). On 23 January 1938 he reported a kite at Worm Cove. In March he saw 3 at this same place (Alexander Sprunt, Jr., unpubl. field notes). Ten active nests were found in the spring of 1938 on Redlight Reef [Observation Reef or Shoal] (Sprunt 1945, Samuel A. Grimes pers. comm.). From 1939 through 1950, numerous kite sightings were made, and 1 female specimen and 5 egg sets were collected (Appendix 3). The estimate of 100 kites in the Lake Okeechobee region in 1950, attributed to L. T. Stem (Bauer 1967), is either a misprint or a gross overestimate. The highest reliable figure reported on the lake during this period was 27 individuals and 10 nests in 1941 (Schroder 1948, 1953) and 12 birds in March 1950 (Skelton 1951).

For the period 1951–1960, the greatest number of kites reported was 11 in 1956 (Wachenfeld 1956), and in that same year 7 nests were found (files of Natl. Audubon Soc., Tavernier, Fla.). Kites were reported each year during this 10-year period except in 1952 and 1954. During this period 7 clutches of eggs were collected on the lake; the last on 4 February 1956 by D. J. Nicholson (Dixon Coll. 20–3). From 1961 to 1970, numerous sightings were made, with up to 6 birds seen at a time (1962 and 1968) and 7 nests were located. Charles E. Carter collected a clutch of eggs (Snyder Coll. 1121) from one of these nests at Moonshine Bay on 18 April 1961.

Since the 1971 drought, kites have used Lake Okeechobee almost continually and in increasing numbers: 31 in May 1971, 11 in December 1972, 42 in May 1973 (Rod Chandler pers. comm.), 41 in April 1974, and 39 in April 1975 (Rod Chandler field notes). Annual censusing produced the following results: 34 in November 1975, 51 in December 1976, 48 in November 1977, 46 in December 1978, 114 in November 1979, and 214 in December 1980. Breeding activity has also increased: 5 nests in 1972, 28 in 1973 (Chandler and Anderson 1974), and 23 each in 1974, 1975, and 1976 (Rod Chandler pers. comm.). The nest totals for each year include renesting attempts. The marsh on the west side of Lake Okeechobee in eastern Glades County represents the second most important habitat for kites in Florida.

CALOOSAHAATCHEE RIVER DRAINAGE AND VICINITY

39. LEE COUNTY. A male (UF 2408) was collected in March 1904 by R. D. Hoyt. A clutch of eggs (MCZ 8483) was taken from a nest in sawgrass bordering a lake on 20 April 1914 by Oscar E. Baynard. Loren Brown collected 2 clutches (AMNH 6962 and 8124) in March 1923 for P. B. Philipp. No specific localities were given for these sets.

40. CALOOSAHAATCHEE RIVER. J. F. George collected a female (FMNH 130044) on the river on 14 January 1885. Scott (1892) described the kite as a resident breeding species of the Caloosahatchee Region during his visit there from 21 November 1891 to 26 April 1892. A female (AMNH 352056) was taken on the river on 14 April 1907. In 1909, major channelization of the river began (Elliot 1955), and the marshes along the river course were destroyed. I am aware of no recent records.

41. LAKE HICPOCHEE. On 9 April 1906, Ike Shaw collected two clutches of eggs (WFVZ 12951, Hoy Coll. N/3) for John L. Childs near Lake Okeechobee [the locality for these sets is believed to be Lake Hicpochee]. Phelps (1912) reported seeing several kites near the lake in March 1912, and Howell (1932) stated that kites were found in numbers around the lake prior to 1932. The only recent record is of two I saw there on 31 May 1971.

42. LAKE FLIRT. A Mr. Hancock collected a set of eggs (WFVZ 52226) for R. D. Hoyt on 14 April 1907 near Lake Flirt. The lake and surrounding marshes were destroyed when major channelization began on the Caloosahatchee River in 1909 (Elliot 1955).

43. SOUTH OF LABELLE. Howell (1932) saw what he thought to be a mated pair in a marsh surrounded by pinewoods 21 km southeast of LaBelle on 14 April 1919.

44. FT. MYERS. A female (MPM 5852), now mounted and on display at the Milwaukee Public Museum, was collected on 10 February 1895

near Ft. Myers by Edward E. Voss. Two clutches of eggs (WVZ 12948, DMNH 10688) were collected there by Ike Shaw on 1 June 1913. Another clutch (NMC E1154) was secured near Ft. Myers on 10 April 1914. No kites have been recorded in the area since 1914.

LOXAHATCHEE SLOUGH (=LOXAHATCHEE MARSH) AND WEST PALM BEACH

45. LOXAHATCHEE SLOUGH AND WEST PALM BEACH. Prior to the 1940s, marshes bordering Clear Lake and Lake Mangonia in West Palm Beach were physically connected by marsh to the Loxahatchee Slough to the west and northwest and were essentially one large wetland community (Earl Diemer pers. comm.). Because the slough and West Palm Beach marsh were physically connected, the historical records are treated together.

W. Heim collected a male (FMNH 16321) in the freshwater marsh west of Palm Beach on 2 March 1896. A male (FMNH 16324) was taken on 28 March 1897 at Palm Beach and another (FMNH 20903) on 5 April at Jupiter. From 12 April through 20 July 1897, 13 clutches of eggs (Appendix 3) were taken in the area. Additional clutches were taken, one (USNM 29477) on 17 April 1901, and another (WVZ 16327) on 10 April 1911. C. P. Ryman collected a clutch of eggs (WVZ 94927) on 1 May 1913, at Palm Beach, and Howell (1932) listed two nests in Loxahatchee Marsh on 16 June 1913. A mounted male [no catalog number] was taken on 6 June 1916, and is now at the Museum of Natural History, University of Iowa. L. C. Sanford took a male (FMNH 59187) on 20 April 1917 and a female (AMNH 9672) on 20 March 1920. In 1921 Howell (1932) reported that kites were breeding abundantly in Loxahatchee Marsh. From 26 February through 11 May of that year at least 7 egg sets and 13 specimens (8 males, 5 females) were collected (Appendix 3). Will Lancier collected a male (DMNH 4971, mounted and on display) on 16 January 1922. Howell (1932) could find no kites in the marsh in the spring of 1923, but Hobart Collins secured a juvenile female (VPI 3918) there on 7 February 1927. I know of no kite records in the area from 1927 until the spring of 1970, when Herbert Gee (pers. comm.) sighted one or more in the Lake Park Reservoir. In 1975, Ray H. Plockelman, Jr. (pers. comm.), saw one in July on the reservoir, and I found a male there on the annual kite census (27 November). On 27 May 1976 Plockelman (pers. comm.) saw 3 in the reservoir, and on 13–14 December 1976, I recorded 2 on the annual census. I saw 6 kites in the reservoir on 20 May 1977, and 2 of the 3 males were in aerial courtship displays. No kites were found during the annual censuses in 1977–1980.

PALM BEACH COUNTY

46. **BOYNTON BEACH.** During the peak of the 1971 drought, I saw a kite flying over Land O'Sun Citrus Groves, 0.4 km west of the Florida Turnpike and 2.3 km south of State Road 804, west of Boynton Beach on 11 May.

THE BIG CYPRESS REGION AND VICINITY

47. **OKALOACOOCHEE SLOUGH.** J. F. Menge secured a clutch of eggs at Bonnet Lake, Lee County, on 23 April 1890. Tom Hand and Frederic H. Kennard sighted several kites on Okaloacoochee Slough on 18 March 1914 (Kennard 1915). I know of no records on the slough since, but very little field work has been done there over the years. The slough and its drainage basin are now dry much of the year due to extensive drainage.

48. **NAPLES.** Howell (1932) listed a specimen [location unknown] taken at Naples about 1 March 1918.

49. **OCHOPEE.** Louis A. Stimson saw a kite over the marsh south of the Tamiami Trail at Ochopee, Collier County, on 3-4 April 1963 (Mason 1965).

50. **MONROE STATION.** During the peak of the 1971 drought, George Sites saw a kite along the Tamiami Trail 9.7 km west of Monroe Station, Collier County, on 17 May (John C. Ogden pers. comm.).

51. **MONROE COUNTY.** J. B. Ellis collected a clutch of eggs (UF 1105) in the county in April 1900. The specific locality was not given.

THE EVERGLADES

52. **EVERGLADES EAST AND SOUTHEAST OF LAKE OKEECHOBEE.** W. F. Sanford collected an immature male (AMNH 750121) in the Everglades east of Lake Okeechobee on 4 March 1913. On 1 May 1913 C. P. Ryman collected a clutch of eggs (WVZ 94927) and 2 specimens south-east of Lake Okeechobee for the Wheeler Brothers. The locations of the specimens are unknown.

53. **64 KM WEST OF WEST PALM BEACH.** Ike Lee collected a clutch of eggs (USNM 45861) for H. H. Bailey 64 km west of West Palm Beach on 26 February 1921.

54. **EVERGLADES AGRICULTURAL AREA.** Sprunt (1942) reported four nests in a marsh south of Clewiston on 2 and 9 November 1941. Two kites were seen south of Little Bare Beach, Palm Beach County, flying over sugarcane fields in January 1956 (Alexander Sprunt, IV, pers. comm.). I saw a brown plumaged bird around a small pond in a pasture on the north side of U. S. Hwy. 27, 6.4 km west of Clewiston, Hendry County,

from 31 May through 23 September 1971.

55. **LOXAHATCHEE N.W.R.** The refuge comprises all of Conservation Area 1 and two tracts adjoining the conservation area, one on the east (Compartments A, B, and C, 267 ha) and the other on the southwest (Compartment D, 526 ha). The Loxahatchee N.W.R. should not be confused with the Loxahatchee Slough, or Marsh, which lies to the northeast of the refuge in the same county. Stieglitz and Thompson (1967:6) made this mistake in interpreting the accounts in Howell (1932) and Bent (1937). The southern part of the refuge occupies that part of the Everglades known as the Hillsboro Marsh. The refuge was created on 1 January 1951 (Cooperative Lease Agreement between the U.S. Fish and Wildlife Service and the Central and Southern Florida Flood Control District, 1 January 1951). No kites were recorded in this area before it became a refuge, probably because access was too difficult. From 1951 through 1960, occasional sightings of 1 to 3 kites were recorded annually on the refuge (Refuge Narrative Reports 1951–1960), except in 1954, 1955, 1958, and 1960. During the 1961–1970 period, frequent sightings were made on the refuge: 2 kites in 1961 and 1962, 7 individuals and 5 nests (only 2 used) in 1963, 19 and 1 nest in 1964, none in 1965, 13 in 1966, none in 1967 and 1968, 31 in 1969, and 46 and 11 nests in 1970. Kites were recorded each year from 1971 through 1980. A maximum of 6 kites was seen on the refuge in 1971, 4 in 1972, 21 in 1973, 28 and 8 nests in 1974, 20 and 3 nests in 1975, 6 to 10 and 1 nest in 1976, 5 in 1977, 3 in 1978, and 1–2 in 1979 and 1980. None was recorded on the 1980 annual census in December.

56. **CONSERVATION AREA 2A (CA2A).** Although kites obviously have occurred in that part of the Everglades that is now CA2A, the earliest report for which we can be absolutely certain was the sighting of a male north of Big Rubber Tree Island (central part of the area) by Frank Ligas (pers. comm.) on 4 October 1957. There were no other reports until Richard L. Thompson and Walter O. Stieglitz saw 8 on 24 August 1965 (Stevenson 1966). In February 1966 Stieglitz and Thompson (1967) reported 21 birds. For the remainder of 1966, Norman Holgersen saw 4 to 20 kites (unpubl. field notes). In the first half of 1967, 4 to 9 kites were seen regularly (Norman Holgersen unpubl. field notes), and 3 nests were found by Earl Diemer (pers. comm.). On 28 October 1967, Earl Diemer and I saw 39 kites in CA2A. Throughout 1968 I saw 20 to 50+ kites in the area and located 11 nests. Up to 89 kites and 15 nests were recorded in 1969. During the 1968–1969 period most of the Florida population was in CA2A. Four nests and 24 birds were seen in 1970. In 1971, the year of the big drought, 43 kites were seen but no nesting occurred. Since 1971 kite use in CA2A has drastically diminished with a maximum of 7 in 1972, none in 1973, 2 in 1974, 7 in 1975, 5 in 1976, 2 in 1977, and

none reported in 1978, 1979, or 1980. The Central and Southern Florida Flood Control District (now South Florida Water Management District) lowered the water level in the spring and early summer of 1973 as a management procedure (J. Walter Dineen pers. comm.), and most of the area was dry for several months. There was no nesting in CA2A during the 1970–1980 period.

57. CONSERVATION AREA 2B (CA2B). As in CA2A, kites undoubtedly occurred historically in what is now CA2B, but data prior to 1968 are lacking. I saw no kites there in 1968 and 1969. In 1970, 20 were seen, 1 nest located, and 2 females were found shot in late December (skin, UMM 6500, J. Walter Dineen pers. comm.; skeleton, UMMZ 216657, Roger A. Martz and Bertram G. Murray, Jr., pers. comm.). On 28 January 1971, 20 birds were sighted, but none was seen again until 12 December 1978, when 6 were counted on the annual census. Then on the annual census of 8 November 1979, 41 birds were counted along the southern and eastern edge of the area. The annual census on 7–8 December 1980 revealed 115 kites in the same parts of CA2B as in 1979.

58. NEW RIVER CANAL. W. R. Collins collected a female (UMMZ 62045) on New River Canal on 15 April 1913. Exactly where along the 96.5 km-long canal was not specified.

59. 64 KM SOUTH OF LAKE OKEECHOBEE. J. F. Menge collected a clutch of eggs (WFVZ 12949) in the Everglades 64 km south of [Lake] Okeechobee on 28 March 1898. This location may have been in what is now CA3A.

60. HEAD OF NEW RIVER. Sidney S. Holt collected a male (PMNH 6799) at the head of New River in the Everglades on 25 January 1897.

61. CONSERVATION AREA 3A (CA3A). As in Loxahatchee N.W.R., CA2A, and CA2B, kites undoubtedly occurred in what is now CA3A, but data prior to 1954 are lacking. Frank Ligas (pers. comm.) saw 2 kites along levee L-37 west of Jomo City on 11 October 1954. This settlement was formerly along U. S. Hwy. 27 just south of Andytown. Ligas (pers. comm., Stevenson 1958) sighted single birds along Hwy. 27 from Andytown to the Miami Canal in 1955, 1956, and 1959. Janice (Mrs. W. J.) Bolte photographed a kite near Andytown in mid-August 1960 (Robertson and Paulson 1961, Bolte 1961). In the summer of 1961, Ligas saw 1 to 3 birds near Andytown (Robertson 1961, Stevenson 1962). Three stayed at the same locality in the winter of 1961–1962 (files of U.S. Fish & Wildlife Service, Delray Beach, Fla.). Erwin Winte and Lee Cunningham saw a kite on 15 and 29 September 1963 between water-control structures S-12-A and S-12-B along the Tamiami Trail (U. S. Hwy. 41) in the southern part of CA3A (Cunningham 1964), and Earl Moore sighted 2 kites approximately 9.7 km northeast of 40-mile Bend in December 1965 (files of Everglades Natl. Park, Homestead, Fla.). From late May through

28 October 1967 up to 6 birds were seen in southeast CA3A near the Tamiami Trail by many observers (John C. Ogden pers. comm., Stevenson 1968), including the author. Two were seen along levee L-67A just north of the trail on 4 July 1968. A bird was seen in southern CA3A on 6 June 1969 but was not found there on the annual kite census in early December.

From 1970 through 1980, the heaviest kite use in Florida was in the southern and southeastern parts of CA3A. The increase in kite use in CA3A since 1974 has been in direct proportion to the overall population increases. It has been the major kite breeding ground since 1976.

Two kites were seen 8 km south of Alligator Alley and about 6.4 km west of the Miami Canal on 19 January 1970, with a nest there that spring. This was the first nest found in CA3A. In late 1970 I counted 65 birds in the southeastern sector (24 September) and 51 in the southern and southwestern sectors (30 November–2 December). In 1971, 36 were recorded in CA3A on 3–5 February, 10 in the southern part on 13 March, 5 along the Trail on 19 April, and 4 in the southeast corner on 19 May. R. Curry counted 44 at a roost in southeast CA3A on 18 July 1971 (Ogden 1971). S. D. Schemnitz (pers. comm.) saw 3 birds along L-28 south of Alligator Alley on the west side of the area on 7–13 October 1971. I saw 7 in southern and eastern Area 3 on 25 October, 12 in the same general locality on 7 November, and 39 on the annual census 9–10 December.

In 1972, S. D. Schemnitz (pers. comm.) also saw one 5.6 km west of water structure S-12-D along the Tamiami Trail on 9 January and 1 along the Miami Canal near the South New River Canal on 18 January. On 10–11 May that year 15 were recorded in CA3A. Through May, June, and July single birds were seen along the Trail and levee L-67A. William B. Robertson, Jr. (pers. comm.) saw a kite in south-central CA3A from a low flying plane on 20 October, and I recorded 15 in eastern and southern CA3A on 26 October. During 1972 Charles and Ella Newell (1973) saw up to 8 kites along Alligator Alley from the vicinity of the toll gate at Andytown west for several kilometers. The annual census on 18 December 1972 recorded 53 in southern CA3A. In January and February 1973, 1 to 2 were seen in the southeastern corner. On annual censuses, 63 kites were recorded in 1973, 48 in 1974, and 62 in 1975. During the spring of 1976, 10+ nests were discovered, and up to 34 kites were seen in the eastern part of the area in March. This was only the second time kites were documented nesting in CA3A. In December 1976, 84 kites were recorded on the annual census, and 7+ nests were in progress at that time. More than 50 kites were seen on 19 May 1977 in eastern CA3A and nesting activities continued. The annual census that year of 19–20 November revealed 100 birds. During 1978, nesting activity in this area surpassed anything recorded before in Florida. By mid-April Noel F. R.

Snyder and I had located 50+ active nests. Nesting activity continued through the summer. The annual census on 12–18 December tallied 212 kites, reflecting the results of this increased nesting activity. The population increase in CA3A continued, with 273 on the annual census in 1979 and 305 in 1980.

62. **TAMIAMI TRAIL.** Bent (1937) saw a kite just north of the Tamiami Trail on the western edge of the Everglades in March 1930. This sighting might possibly have been in what is now CA3A near 40-mile Bend. CA3A was created by the completion of the levee system in June 1965 (Anonymous 1965).

63. **CONSERVATION AREA 3B (CA3B).** Kites were observed periodically from 1970 to 1980 along the west edge of CA3B, primarily between levees L-67A and L-67C and in the southwest corner.

64. **EAST OF CONSERVATION AREA 3B.** A bird was seen at the intersection of U. S. Hwy. 27 and State Road 820 (Hollywood Road), Broward County, by Clark Olson and George Brown on 10 June 1967 (John C. Ogden pers. comm.).

65. **HEAD OF MIAMI RIVER AND VICINITY.** Edward Harris (1844) collected an immature male (ANSP 1942) near the head of the Miami River on 29 April 1844 in what at that time was the eastern edge of the Everglades. This was the first record of the Snail Kite in the United States. The locality is near the rapids on the north fork of the Miami River. The rapids existed until circa 1909; they were destroyed when the Miami Canal was dug (Hart 1975). According to Parker et al. (1955) this site is just west of the present NW 27th Avenue Bridge in the City of Miami and approximately 2.4 km east of the Miami International Airport.

A. L. Heerman collected 4 specimens in the same general locality at the head of the Miami River on 6 May 1848 (Howell 1932). USNM 11955 is probably one of these (Deignan 1961). On 18 February 1870 C. J. Maynard saw a kite and on 28 February secured 3 specimens [present locations of which are unknown], and found a partly completed nest near the river in the Everglades (Baird et al. 1874). On 24 March 1870, Maynard found a second nest and collected the one egg (MCZ 4260; clutch incomplete) and the female of this nest (Baird et al. 1874). A female (Zool. Institute, Acad. Sci., Leningrad, 132960) was taken on 3 March 1871, with the locality marked "Miami" and no collector listed. This specimen was acquired from the MCZ, Harvard (A. I. Ivanov pers. comm.). On 25 March 1871, Maynard collected a male (USNM 61187) near the head of the Miami River in the Everglades. This is the type specimen for *R. s. plumbeus* (Baird et al. 1874). On 16 March 1883, E. W. Montreuil collected 2 downy chicks (unsexed) (MCZ 208238 and BMNH 1887-5-1-1009), a male (MCZ 208236), a female (MCZ 208237), and a clutch of eggs (AMNH 424; Bailey 1884), all in the Everglades near

Miami. A juvenile male (UMMZ 12146) and an unsexed brown bird (SDNMH 19910) were taken in the winter of 1884 on the Miami River and a female (AMNH 470952) at the same locality on 10 December 1884. An Indian collected a clutch of eggs (USNM 28428) for W. L. Ralph near Miami on 5 March 1897, and an immature male (PMNH 8775) was taken at that locality on 20 May 1899. A local guide presented A. C. Bent (1937) a set of eggs (UF 52273) and a specimen (unsexed) that were collected near Miami on 28 April 1903. The location of this skin is unknown. On 2 March 1904, J. F. George secured a juvenile female (FMNH 130045) and a juvenile male (FMNH 130046) at Miami. W. S. Dickerson collected 4 specimens near Miami in early October 1904, a female (MCZ 300635) on 2 October and 2 females (MCZ 300635 and ROM 35684) and a male (AMNH 352055) on 5 October.

66. DADE COUNTY. Dade County was established 4 February 1836, and until the early 1900s comprised what is now Broward, Dade, and Palm Beach counties. Palm Beach County separated from Dade on 30 April 1909 and Broward from Dade on 30 April 1915. The following records list only Dade County for the locality. W. B. Porter collected a set of eggs (USNM 24842) on 15 April 1891 and J. T. Albritton took an adult male (MCZ 252439) on 28 April 1903. From 1912 through 1915, 21 clutches of eggs were listed as taken in Dade County, and 2 more clutches were secured in March 1917 (Appendix 3).

67. PARADISE KEY AND VICINITY. Paradise Key is on Taylor Slough in the southern part of the Everglades. In 1915 the area became Royal Palm State Park, which, in turn, became part of the Everglades National Park in 1947 (Tebeau 1971). Bent (1937) reported a small breeding colony of kites near there in 1904, and Mrs. Hiram Byrd had a sighting on 21 May 1915. Other early records include a pair seen there on 26–27 January 1918 (Howell 1921), one found there by Arthur H. Howell on 19 June 1918, and several sightings in October 1918 by Charles A. Mosier, Park Warden (Howell 1921). H. H. Bailey collected a male (VPI 2215) south of Royal Palm State Park on 3 January 1925, and A. H. Howell (1932) secured a female (MVZ 80895) at the hammock 1 December 1928 and saw another kite there the next day.

68. CUTHBERT LAKE. A. C. Bent and Herbert K. Job saw 6 kites at a roost at Cuthbert Lake on 1 May 1903 (Dutcher 1904, Job 1905). The Lake is at the inland edge of the mangrove forest and at the southern end of the true Everglades.

69. NORTHEAST OF WEST LAKE. J. C. Howell (unpubl. field notebook) saw 2 kites about 5 km northeast of West Lake in the southern Everglades on 28 March 1934.

70. EVERGLADES NATIONAL PARK (ENP). The park was established in 1947 (Tebeau 1971). Paradise Key, Cuthbert Lake, West Lake, 64 km

southwest of Miami, headwaters of Harney River, head of Shark River, and Big Sawgrass are all within the present boundary of the park.

Erwin Winte saw a Snail Kite 1.6 km east of Onion Slough on 2 June 1948 (files ENP), and Charles Brookfield (1949) saw one at Taylor Slough near Paradise Key on 30 October that same year. Winte (files ENP) reported seeing single birds in Shark Valley on 19 December 1954 and at the headwaters of the Shark River on 8 January 1955. He saw 1 or more birds south of the Tamiami Trail in March and April 1955 (Stevenson 1955b) and 2 at the 7-mile fire tower in Shark Valley on 19 April 1955. Winte and Lee Chamberlain saw a kite just south of water control structures S-12-A and B in the northern part of the park on 29 September 1963 (Cunningham 1964). M. Holden and Ralph Miele saw 3 kites along levee L-67 extension in the northeastern part of the park on 17 May 1967 (John C. Ogden pers. comm.). On 8 July 1967, Ogden saw a bird over Royal Palm Visitor Center and in that part of the park called the Hole-in-the-Donut. Winte saw 3 on the west side of levee L-67 extension about 8 km south of the Tamiami Trail on 9 July; two days later Ogden and William B. Robertson, Jr., saw 2 in the same place. On 21 July 1967 Miele and Ogden saw 2 hunting over Taylor Slough, 2.4 km south of Royal Palm Visitor Center (John C. Ogden pers. comm.). Park rangers reported up to 8 kites in the northeast sector of the park during November 1967 (Robertson 1968). On 5 August 1969, Ogden (pers. comm.) and others saw a kite along the Shark Valley Loop Road, and in December that year I counted 9 in the northern part of the park on the annual census. I saw 1 to 5 kites on the south side of water control structure S-12-D on 1 and 9 May 1970 and 13 in the northern part of the park on the annual census 2 December 1970. During 1971 I saw up to 14 birds in the northern part of the park, the number decreasing to 6 by December. From 1972 through 1978 only an occasional kite was seen south of the Tamiami Trail in the park. From 1 to 10 kites were seen from 17 May to 24 August 1979 from the northeastern part of the park east to the old Blue Shanty Canal (Oron L. Bass, Jr. pers. comm.). George Avery and Robert P. Russell, Jr. (pers. comm.) saw a brown kite south of Sweet Bay Pond on 6 September 1979. Throughout 1979 and early 1980 many kites were seen in the vicinity of the Shark Valley Loop Road, and on the annual census 23 November 1979, 3 were seen 8-10 km SSW of Royal Palm Visitor Center on Taylor Slough. On the 1980 annual census 14 kites were found in the Park, 1 along levee L-67 Extension near its southern end, 1 just north of Rookery Branch in the southern part of Shark Valley Slough, and 12 on Taylor Slough south of the Royal Palm Visitors Center.

71. SOUTHWEST OF MIAMI OPPOSITE KEY LARGO. Five clutches (USNM 28422, 28423, 28425, 28426 and MNHOS 2597) were collected

southwest of Miami opposite Key Largo in the southeastern part of the Everglades by Charlie Billie for William L. Ralph on 13 March 1897. On 23 April 1899, a male (CM 3764) and a second bird (correct sex of this bird is questionable) (CM 3765) were collected near Card Sound by Frederic S. Webster. William B. Robertson, Jr. (pers. comm.) saw a brown kite just west of U. S. Hwy. 1 and about 5 km north of C-11 canal on 4 October 1979, and Robert P. Russell, Jr. (pers. comm.) counted 1 to 3 birds in the same area in late October and early November. A kite was seen here again in the fall of 1980 (C. Wesley Biggs pers. comm.).

72. 64 KM SOUTHWEST OF MIAMI. R. D. Hoyt collected a clutch of eggs 64 km southwest of Miami on 14 May (MCZ 8481) and another on 18 May 1902 (SBMNH 362-138).

73. EVERGLADES. For 17 specimens and 4 sets of eggs, dating from 1883 to 1916, the labels state only Everglades, with no specific locality given (Appendix 3).

74. EVERGLADES, MONROE COUNTY. Three clutches of eggs (WVZ 12950, MCZ 8484, SBCM 9884) were collected in April of 1911 and 1912 in that part of the Everglades within Monroe County by J. B. Ellis, of Chokoloskee, Florida. No specific localities were given.

75. HEADWATERS OF HARNEY RIVER. Hugh L. Willoughby, in company of Ed Brewer, a local guide and hunter, saw 2 kites at the headwaters of the Harney River, Monroe County, on 9 January 1897, in the course of their journey across the southern Everglades by canoe (Willoughby 1898).

76. HEAD OF SHARK RIVER. On 23 February 1935, Alexander Sprunt, Jr. (unpubl. field notes), saw a kite flying over the mangroves at the head of Shark River.

77. BIG SAWGRASS. The Big Sawgrass appears to be the name given by early residents to the general area of the southern Everglades in the vicinity of Whitewater Bay in what is now the Everglades National Park. Outram Bangs collected a male (MCZ 111499) and a female (MCZ 111500) there on 20 May 1902. An unknown collector took a clutch of eggs (AMNH 8123) there on 26 April 1907, saw two pairs of kites, and found a second nest.

SOUTHERN FLORIDA

78. SOUTHERN FLORIDA. A female (MCZ 100918) was collected at an unspecified locality in southern Florida on 5 May 1883. This specimen was obtained from C. K. Worthen, a dealer in bird specimens and eggs.

FLORIDA KEYS

79. PLANTATION KEY. C. N. Grimshawe and Louise Moore sighted 2 kites on the southern end of Plantation Key in January 1942 (Moore

1942). If the sighting is valid, it is remarkable, as there are no permanent bodies of fresh water on the Upper Keys, and as yet we have no evidence that Snail Kites move between Florida and Cuba, although such movements may occur.

STATE OF FLORIDA

80. FLORIDA. Some of the Snail Kite material in collections simply has "Florida" on the labels and in the catalogues, including skins of 4 males, 3 females, 3 unsexed birds, and a set of eggs (Appendix 3).

RECORDS OF SNAIL KITES IN THE UNITED STATES OUTSIDE FLORIDA

LONG COUNTY, GEORGIA. During the 1971 drought in Florida, there was an unconfirmed sight record of 1 and possibly 2 Snail Kites approximately 4.8 km southeast of Ludowici on State Road 99 in the Coastal Plain of Georgia on 23 April (Ernest Provost and David Peterson pers. comm.).

SOUTHERN TEXAS. On 4 October 1971, Jimmie and John C. Arvin saw a Snail Kite at the southern end of Padre Island, Cameron County, the first record for the species in Texas (Webster 1972). Harold R. Holt and James A. Lane saw another 9.7 km south of Port Lavaca, Calhoun County, on 26 April 1974 (Webster 1974). Richard O. Albert and others saw a brown plumaged bird at Lake Alice, Jim Wells County, on 22–26 July 1977, and Tom Albert and others saw one at the same locality for several days in July 1978 (Webster 1977, 1978). The four sightings are undoubtedly *R. s. major* from Mexico, as Webster (1972, 1977) suggested, rather than *R. s. plumbeus* from Florida or Cuba.

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APPENDIX I

CURATED COLLECTIONS WITH NO SNAIL KITE MATERIAL FROM FLORIDA

UNITED STATES: ALABAMA—Univ. Alabama. ARIZONA—Univ. Arizona. CALIFORNIA—Los Angeles County Mus. Nat. Hist.; Moore Lab. Zool., Occidental College; Stanford Univ.; Sespe Mus. Comparative Zool., Filmore; Univ. California, Los Angeles. COLORADO—Denver Mus. Nat. Hist.; Univ. Colorado. CONNECTICUT—Univ. Connecticut. DELAWARE—Univ. Delaware. FLORIDA—Albert Schwartz Coll., Miami; Archbold Biol. Sta., Lake Placid; Florida Southern College; Florida State Univ.; Florida Technological Univ.; Mus. Sci. & Planetarium of Dade County, Miami; Tall Timbers Res. Sta., Tallahassee; Univ. Central Florida; Univ. Florida; Univ. South Florida. GEORGIA—Richard A. Parks Coll., Atlanta; Univ. Georgia. ILLINOIS—Illinois State Mus.; Northern Illinois Univ.; Univ. Illinois. INDIANA—Purdue Univ. IOWA—Davenport Mus. KANSAS—Univ. Kansas. KENTUCKY—Univ. Louisville. LOUISIANA—Louisiana State Univ.; Tulane Univ. MAINE—Univ. Maine. MASSACHUSETTS—Mus. Sci., Boston; Peabody Mus., Salem; Sci. Mus., Springfield; Univ. Massachusetts. MICHIGAN—Central Michigan Univ.; Michigan

State Univ. Mus.; Olin S. Pettingill, Jr. Coll., Pellston; Univ. Michigan Biol. Sta., Pellston. MINNESOTA—St. Cloud State College; Univ. Minnesota. MISSISSIPPI—State Wildlife Mus., Jackson; Univ. Mississippi; Mississippi State Univ. MISSOURI—Univ. Missouri. MONTANA—Univ. Montana. NEBRASKA—Univ. Nebraska. NEW HAMPSHIRE—Dartmouth College Mus. NEW JERSEY—New Jersey State Mus. NEW MEXICO—Univ. New Mexico; Western New Mexico Univ. NEW YORK—Buffalo Mus. Sci.; Cornell Univ.; New York State Mus.; Rochester Mus.; Walter R. Spofford Coll., Etna; State Univ. College, Oneonta. NORTH CAROLINA—North Carolina State Mus. Nat. Hist.; North Carolina State Univ. NORTH DAKOTA—Univ. North Dakota. OHIO—Cincinnati Mus. Nat. Hist.; Cleveland Mus. Nat. Hist. OKLAHOMA—Stovall Mus., Univ. Oklahoma; George M. Sutton Coll., Norman. OREGON—Univ. Oregon; Alex Walker Coll., Tillamook; PENNSYLVANIA—Everhart Mus. Nat. Hist., Scranton; Pennsylvania State Univ; West Chester State College. SOUTH CAROLINA—Florence Mus., Florence. TENNESSEE—Albert F. Ganier Coll., Nashville; Univ. Tennessee. TEXAS—Dallas Mus. Nat. Hist.; Travis C. Meitzen Coll., Refugio; Strecker Mus., Baylor Univ.; Texas A & M Univ.; Texas Memorial Mus., Austin; L. R. Wolfe Coll., Kerrville. UTAH—Life Sci. Mus., Brigham Young Univ.; Univ. Utah. VERMONT—Fairbanks Mus., St. Johnsbury. VIRGINIA—Harold H. Bailey Coll., Rockbridge Alum Springs; Walter A. Weber Coll., Oakton. WASHINGTON—Washington State Univ. WISCONSIN—Carl H. Richter Coll., Oconto; Zool. Mus., Univ. Wisconsin, Madison.

CANADA: ALBERTA—Univ. Alberta. BRITISH COLUMBIA—British Columbia Prov. Mus. ONTARIO—Hoyes Lloyd Coll., Ottawa; Univ. Western Ontario. SASKATCHEWAN—Saskatchewan Mus. Nat. Hist.

OTHER COUNTRIES: AUSTRIA—Oberosterreichisches Landesmuseum, Abteilung Zoologie, Linz; Naturhistorisches Mus. Wien, Wien. BELGIUM—Institut Royal des Sci. Naturelles, Brussels. ENGLAND—Norwich Castle Mus., Norwich. FRANCE—Mus. Natl. d'Histoire Naturelle, Paris. GERMANY—Mus. fur Naturkunde, Bereich Zoologisches Mus., Berlin. MEXICO—Instituto de Biologia, Univ. Nacional Autonoma, Mexico City. NETHERLANDS—Rijksmuseum van Natuurlijke Historie, Leiden. SWEDEN—Naturhistoriska Museet, Goteborg; Naturhistoriska Riksmuseet, Stockholm. SWITZERLAND—Mus. d'Histoire Naturelle, Geneva; Naturhistorisches Mus., St. Gallen.

APPENDIX 2

LEGAL DESCRIPTIONS OF FLORIDA LOCALITIES

Legal descriptions of the localities in Florida that were used by the Snail Kite during 1968–1980. The land grid references are based on the Florida coordinate system (Tallahassee Meridian).

ST. JOHNS RESERVOIR. All or parts of Sections 6, 7, 18, and 19 of T-33-S, R-37-E.

CLOUD LAKE RESERVOIR. S 1/2 of Section 16 and N 1/2 of Section 21, T-34-S, R-38-E.

STRAZZULLA RESERVOIR. SW 1/4 of Section 21, T-34-S, R-38-E.

THE SAVANNAS. Parts of Section 22, 23, 26, 35, and 36, T-35-S, R-40-E.

LAKE OKEECHOBEE. Parts or all of T-39-S, R-35-E; T-39-S, R-34-E; T-40-S, R-34-E; T-40-S, R-33-E; T-40-S, R-32-E; T-41-S, R-32-E; T-41-S, R-33-E; T-41-S, R-34-E; T-42-S, R-33-E; and T-42-S, R-34-E.

LAKE PARK RESERVOIR. Parts of Sections 21, 28 and 33, T-42-S, R-42-E and Sections 4, 5, 8, 9, and 17, T-43-S, R-42-E.

LOXAHATCHEE NATIONAL WILDLIFE REFUGE. Parts of T-44-S, R-40-E; T-45-S, R-41-E; T-46-S, R-41-E; T-47-S, R-41-E; T-47-S, R-40-E; T-46-S, R-40-E; and T-46-S, R-39-E.

CONSERVATION AREA 2A. Parts of T-47-S, R-40-E; T-47-S, R-39-E; T-48-S, R-40-E; T-49-S, R-40-E; and T-49-S, R-39-E.

CONSERVATION AREA 2B. Parts of T-49-S, R-39-E; T-49-S, R-40-E; and T-50-S, R-40-E.

CONSERVATION AREA 3A. Parts of T-50-S, R-37-E; T-50-S, R-38-E; T-50-S, R-39-E; T-51-S, R-38-E; T-51-S, R-37-E; T-52-S, R-38-E; T-52-S, R-37-E; T-53-S, R-37-E; T-53-S, R-36-E; T-53-S, R-35-E; T-54-S, R-36-E; and T-54-S, R-35-E.

CONSERVATION AREA 3B. Part of T-54-S, R-37-E.

THE POCKET. Parts of T-51-S, R-38-E; T-52-S, R-38-E; T-52-S, R-37-E; T-53-S, R-37-E; and T-54-S, R-37-E.

EVERGLADES NATIONAL PARK. Parts of T-54-S, R-35-E; T-54-S, R-36-E; T-55-S, R-36-E; T-58-S, R-37-E, and T-59-S, R-37-E.

APPENDIX 3

SNAIL KITE SPECIMENS, SKELETONS, AND EGG SETS FROM FLORIDA¹

This appendix contains a listing of 159 museum-type skins or mounts (73 males, 57 females, 2 juvenile males, 1 juvenile female, 5 unsexed juveniles, 1 male nestling, 2 unsexed nestlings, and 18 specimens for which the present locations, sexes, and ages are unknown), 148 egg sets, and 1 complete skeleton. The breakdown by decades of collecting is as follows: 1840-49, 5 skins; 1850-59 and 1860-69, no material; 1870-79, 33 skins and an egg set; 1880-89, 38 skins and an egg set; 1890-99, 26 skins and 24 egg sets; 1900-09, 16 skins and 12 egg sets; 1910-19, 14 skins and 41 egg sets; 1920-29, 38 skins and 46 egg sets; 1930-39, 3 skins and 9 egg sets; 1940-49, 2 skins and 6 egg sets; 1950-59, 7 egg sets; 1960-69, 2 skins (salvaged dead nestlings) and an egg set; 1970-79, 2 skins (salvaged female found shot, salvaged dead nestling) and a skeleton (salvaged female found shot); and 1980, no material.

About 88% of the Snail Kite material collected in Florida was obtained between the mid 1870s and the late 1920s when interest in collecting skins and eggs was at its peak, laws governing regulation of such activities were weak or nonexistent, and the concept of wildlife conservation was in its infancy. Unfortunately, few of the skins have any important biological data on the labels (i.e. weight, reproductive condition, stomach contents, endo- and ectoparasites present), primarily because such data were not considered important at the time. However, the egg data sheets of many sets contain considerable information that will be published (Sykes MS in prep.).

Since only one complete skeleton is known to exist for a Snail Kite from Florida, and there is no whole (fluid/alcoholic) specimen, any material of this species salvaged in the State hereafter should be preserved as a fluid or freeze-dried specimen, or if not suitable for soft-tissue preparation it should be skeletonized.

BIG SAWGRASS (WHITEWATER BAY AREA)—20 May 1902, male MCZ 111499, female MCZ 111500; 26 April 1907, AMNH 8123.

¹Abbreviations for the curatorial institutions are listed in Table 1 (p. 263).

BREVARD COUNTY—5 Jan.–15 April 1889, 4 specimens [loc. spec. unk.] (Baker 1889); 30 March 1924, male UMMZ 62039, female UMMZ 62040; 30 March 1930, male MCZ 252440.

BREVARD COUNTY [ST. JOHNS MARSH]—5 March 1927, AMNH 6961.

CALOOSAHATCHEE RIVER—14 Jan. 1885, female FMNH 130044; 14 April 1907, female AMNH 352056.

CHASSAHOWITZKA RIVER—Spring 1918, specimen [loc. spec. unk.] (Howell 1932).

CONSERVATION AREA 2A—1 April 1967, unsexed nestling USNM 531421; 17 March 1968, female nestling USNM 531685.

CONSERVATION AREA 2B—20 Dec. 1970, female, Univ. Miami 6500; 27 Dec. 1970, female (skeleton) UMMZ 216657.

CRESCENT CITY, VICINITY OF—1894, near Crescent City, USNM 28048.

DADE COUNTY—15 April 1891, 24842 USNM; 28 April 1903, male MCZ 252439; 18 Feb. 1912, WFFVZ 8070; 20 Feb. 1912, WFFVZ 79804, AMNH 8122; 25 April 1913, DMNH 10692; 26 April 1913, WFFVZ 59622; 27 April 1913, UWGB 18; 28 April 1913, SBMNH 357–320; 3 June 1913, Bull Coll. 23/3; 5 June 1913, Hoy Coll. 25; 20 June 1913, WFFVZ 12945; 26 March 1914, WFFVZ 12946; 27 March 1914, AMNH 8126, Hoy Coll. 32, SBCM 9426; 28 March 1914, AMNH 8129, MVZ 7575, DMNH 10691; 21 May 1914, ANSP [no catalogue No.], MVZ 5155; 7 March 1915, Hoy Coll. 36a; 2 April 1915, WFFVZ 6441; 10 March 1917, WFFVZ 8071, AMNH 8127.

DESOTO COUNTY—8 March 1888, male BMNH 1890–4–28–249, female BMNH 1890–4–28–250.

EVERGLADES—March 1883, male AMNH 45042, male BMNH 1887–5–1–1007, female BMNH 1887–5–1–1008; 18 March 1883, female USNM 101402; April [1883?], unsexed AMNH 45043; May 1883, female USNM 100195; 25 Sept. 1883, female BMNH 1887–5–1–1009, unsexed BMNH 1955–6–N–20–948; 26 Sept. 1883, male MCZ [catalog No. ?]; 6 Sept. 1895, female UMMZ 217682, female DMNH 5158; 25 Feb. 1898, CM 4913; 15 April 1905, MCZ 8482; 15 Jan. 1906, female MCZ 304883, female MCZ 304884; 2 June 1913, AMNH 8128; 19 June 1913, unsexed juv. MCZ 320657; 21 June 1913, unsexed juv. MCZ 320658; [no date given; probably 1913–1914 period], SBMNH 87; 10 Jan. 1916, male MCZ 322149, female MCZ 322150.

EVERGLADES, EAST OF LAKE OKEECHOBEE—4 March 1913, male AMNH 750121.

EVERGLADES, MONROE COUNTY—April 1911, WFFVZ 12950; 16 April 1912, MCZ 8484; 20 April 1912, SBCM 9884.

EVERGLADES, 64 KM SOUTH OF LAKE OKEECHOBEE—28 March 1898, WFFVZ 12949.

EVERGLADES, 64 KM SOUTHWEST OF MIAMI—14 May 1902, MCZ 8481; 18 May 1902, SBMNH 362–138.

EVERGLADES, 64 KM WEST OF WEST PALM BEACH—26 Feb. 1921, USNM 45861.

EVERGLADES, SOUTHEAST OF LAKE OKEECHOBEE—1 May 1913, WFFVZ 94927; 2 specimens [loc. spec. unk.; info from label data WFFVZ 94927].

EVERGLADES, SOUTHWEST OF MIAMI, OPPOSITE KEY LARGO—13 March 1897, USNM 28422, USNM 28423, USNM 28425, USNM 28426, MNHOS 2597; 23 April 1899, Card Sound, male CM 3764, male [?] CM 3765.

FLORIDA—May 1876, female BMNH 1906–12–7–594; 2 April 1889, male MPM 6681, female MPM 6682; [date unk.], BMNH 1891–3–1–482; 15 April 1897, female FMNH 16322, male FMNH 16323; 1909, unsexed Calif. AS 27098; 1920, male AMNH 750120; [dates unk.], unsexed juv. BMNH 1955–6–N–20–946, male BMNH 1955–6–N–20–950; [date unk.], unsexed ANSP 1943; [date unk.], USNM 16827.

FLORIDA, SOUTHERN—5 May 1883, female MCZ 100918.

FT. MYERS, VICINITY OF—10 Feb. 1895, female (mounted) MPM 5852; 1 June 1913, WFFVZ 12948, DMNH 10688; 10 April 1914, NMC E1154.

- INDIAN RIVER, SOUTHERN PART—Summer 1874, female ROM 35683.
- JACKSONVILLE, VICINITY OF—[circa Feb.] 1884, 3 specimens [loc. spec. unk.] (Boardman 1884, Grimes 1944).
- KISSIMMEE PRAIRIE—[6] Nov. 1888, specimen [loc. spec. unk.] (Fargo 1934).
- KISSIMMEE RIVER—Feb. 1888, female FMNH 37653.
- LAKE BUTLER [= LAKE TARPON]—10 May 1895, male ANSP 45611.
- LAKE FLIRT—14 April 1907, near Lake Flirt, WFVZ 52226.
- LAKE HICPOCHEE—9 April 1906, near Lake Okeechobee [probably Lake Hicpochee], WFVZ 12951, Hoy Coll. N/3.
- LAKE MONROE—7 Feb. 1883, male FMNH 37654.
- LAKE OKEECHOBEE, WEST SIDE—Nov. 1884, male FMNH 130047; 20 April 1906, SBCM 9631; 30 Oct. 1908, female MVZ 6518, male MVZ 6517; 20 May 1913, WFVZ 12953, WFVZ 12954; 21 May 1913, WFVZ 12952; 22 May 1913, Hoy Coll. 4/4; 23 May 1913, USNM 43605; 4 May 1940, Charleston Mus. LO/1; 15 March 1943 [probably Lake Okeechobee], CU 10005; 13 May 1943, 8 km north of Moore Haven, female nestling UMMZ 121468, Red Reef Point, WFVZ 79290; 10 April 1944 [probably Lake Okeechobee], CU 11093; 17 Feb. 1945, 16 km NE of Moore Haven, MCZ 12435; 28 March 1953, Moonshine Bay, CM 4914; 31 March 1953, Moonshine Bay, WFVZ 79289, DMNH 5058; 4 Feb. 1955, DMNH 5055, 5056; 5 Feb. 1955, DMNH 5057; 4 Feb. 1956, Dixon Coll. 20-3; 18 April 1961, Snyder Coll. 1121.
- LAKE PANASOFFKEE—4 Feb. 1876, male PMZ 5099; 15 Feb. 1876, female FMNH 300639, female FMNH 300641; 17 Feb. 1876, female BMNH 1900-12-1-13, female BMNH 1900-12-1-12, male FMNH 300640, female UMMZ 62043; 18 Feb. 1876, male FMNH 300635, male FMNH 300638, female MCZ 230472, female MCZ 92620, female (mounted) PMZ 566, male MCZ 92621, male PMNH 605; 25 Feb. 1876, female UMMZ 62042, female MCZ 30536; 29 Feb. 1876, male (old PMZ 5102) UM; 18 March 1876, female [no catalog No.] Chicago Acad Sci.; 23 March 1876, female PMZ 5103, unsexed FMNH 300643, male FMNH 300642, male UMMZ 62041.
- LAKE TOHOPEKALIGA, VICINITY OF—18 Feb. 1895, Tohopekaliga Cypress [lakes in Osceola Co.], female USNM 151034; 10 May 1895, Little Marsh [Osceola Co.], male USNM 151035; 30 May 1895, Tohopekaliga Cypress, male USNM 151033.
- LAKE WASHINGTON, SOUTH OF—7 May 1926, WFVZ 16326 (Wolfe 1938), MNHOS 4797.
- LEE COUNTY—March 1904, male UF 2408; 20 April 1914, MCZ 8483; 8 March 1923, AMNH 6962; 10 March 1923, AMNH 8124.
- LOXAHATCHEE NATIONAL WILDLIFE REFUGE—3 April 1970, unsexed nestling USNM 563988.
- LOXAHATCHEE SLOUGH AND WEST PALM BEACH—2 March 1896, marsh west of West Palm Beach, male FMNH 16321; 28 March 1897, Palm Beach, male FMNH 16324; 5 April 1897, Jupiter, male FMNH 20903; 12 April 1897, Lake Worth, MCZ 4259; 25 April 1897, 14.5 km north of West Palm Beach, USNM 29141, 14.5 km NW of Palm Beach, USNM 29751; 9 June 1897, 6.4 km west of Palm Beach, USNM 29142, near West Palm Beach, WFVZ 9987; 25 June 1897, 14.5 km from West Palm Beach, USNM 29754, MNHUPS 13/3; 28 June 1897, 16 km from West Palm Beach, USNM 29146, MCZ 8485, 14.5 km from West Palm Beach, USNM 29147, USNM 29753, WFVZ 12944; 20 July 1897, near West Palm Beach, USNM 29148; 17 April 1901, 8 km NW of West Palm Beach, USNM 29477; 10 April 1911, Loxahatchee Marsh, WFVZ 16327; 1 May 1913, Palm Beach, WFVZ 94927; 16 June 1913, 2 nests with eggs in Loxahatchee Marsh (Howell 1932); 6 June 1916, Loxahatchee Marsh, male (mounted) [no catalogue No.] MNHUI; 20 April 1917, Palm Beach, male FMNH 59187; 20 March 1920, West Palm Beach, female AMNH 9672; 26 Feb. 1921, Palm Beach County, Calif. AS 3976; 27 Feb. 1921, Palm Beach County, Hoy Coll. 4; 26/28 Feb. 1921, Loxahatchee Marsh, VPI 3/3, VPI 5/

3, Snyder Coll. 1776, WFVZ 65864, WFVZ 65865; March 1921, West Palm Beach, male Calif. AS 27099; 17 March 1921, West Palm Beach, male AMNH 750126; 18 March 1921, West Palm Beach, male AMNH 750128; 19 March 1921, West Palm Beach, female AMNH 750130, male MVZ 99636, female MVZ 99637, male MVZ 99638, female MVZ 81821; 20 March 1921, West Palm Beach, female AMNH 750131; 8 April 1921, West Palm Beach, male AMNH 750122, male AMNH 750123; 12 April 1921, Palm Beach, juv. female CM 144496; 11 May 1921, West Palm Beach, male AMNH 750125; 16 Jan. 1922, Loxahatchee, male Bailey Coll. Nat. Hist. 4971 [now a mounted specimen at DMNH].

MANATEE COUNTY—19 Dec. 1886, male MCZ 226057; 20 Dec. 1886, female FMNH 37651.

MIAMI RIVER, HEAD OF AND VICINITY—29 April 1844, immature male ANSP 1942 (first record of the species in the United States) (Harris 1844); 6 May 1848, 4 specimens (Howell 1932) [USNM 11955 is probably one of these (Deignan 1961); loc. of other 3 spec. unk.]; 28 Feb. 1870, 3 specimens (Baird et al. 1874) [loc. spec. unk.]; 24 March 1870 female (in breeding condition) (Baird et al. 1874) [loc. spec. unk.], MCZ 4260 (Baird et al. 1874); 3 March 1871, female Zool. Institute, Acad. Sci., Leningrad, U.S.S.R. 132960; 25 March 1871, adult male USNM 61187 (type specimen for *R. s. plumbeus*); [early 1870's], male BMNH 1955-6-N-20-947; March 1883, unsexed downy nestling MCZ 208238, unsexed downy nestling BMNH 1887-5-1-1009, female MCZ 208237, male MCZ 208236, 16 March 1883, AMNH 424 (Bailey 1884); late winter 1884, male UMMZ 121467; winter 1884, unsexed SDNHM 19910; 10 Dec. 1884, female AMNH 470952; 5 March 1897, USNM 28428; 20 May 1899, male PMNH 8775; 28 April 1903, UF 52273 (Bent 1937); 2 March 1904, female FMNH 130045, male FMNH 130046; 2 Oct. 1904, female MCZ 300634; 5 Oct. 1904, female MCZ 300635, male AMNH 352055, female ROM 35684.

MICANOPY—4 Dec. 1919, CM 4914 (Swann 1934).

MONROE COUNTY—April 1900, UF 1105.

NAPLES—Circa 1 March 1918, specimen (Howell 1932) [loc. spec. unk.].

NEW RIVER CANAL—15 April 1913, female UMMZ 62045.

NEW RIVER, HEAD OF—25 Jan. 1897, male PMNH 6799; March 1905, Chicago Acad. Sci. 28.

OKALOACOOCHEE SLOUGH—23 APRIL 1890, BONNET LAKE, LEE CO. [PRESENT HENDRY CO.], HOY COLL. 429.

PARADISE KEY, VICINITY OF—3 Jan. 1925, male VPI 2215; 1 Dec. 1928, female MVZ 80895.

ST. JOHNS RIVER, HEADWATERS OF—10 May 1923, 16 km west of Malabar, unsexed juv. USNM 287887, unsexed juv. USNM 287886, female USNM 287882, male USNM 287883; 11 May 1923, 16 km west of Malabar, male USNM 287881, male USNM 287885, female USNM 287884; 27 April 1925, west of Fellsmere, DMNH 5059, AMNH 6960; 12 May 1925, west of Fellsmere, Hoy Coll. 5/3; 13 May 1925, Fellsmere, male USNM 298783, male USNM 298782, 11 km west of Fellsmere, juv. male USNM 298784, juv. male USNM 298785, female USNM 298781, 14.5 km west of Fellsmere, DMNH 10687; 2 April 1926, west of Fellsmere, MNHOS 4796; 28 April 1926, west of Valkaria, WFVZ 8069; 29 April 1926, head of St. Johns River, Bull Coll. 12/3, SBCM 17478; 30 April 1926, west of Fellsmere, WFVZ 16325 (Wolfe 1938), Hoy Coll. 14/3; 14 Feb. 1927, west of Fellsmere, WFVZ 86341, Hoy Coll. 20/3, St. Johns Marsh, Brevard Co., DMNH 10689, north of Fellsmere Canal, MNHUPS 9/4; 15 Feb. 1927, 1.6 km north of Fellsmere Canal, MNHUPS 5/4, Hoy Coll. 22/3, Hoy Coll. 12/3, and Hoy Coll. 25/2, WFVZ 66254; 3.2 km north of canal west of Fellsmere, WFVZ 12947, west of Fellsmere, MNHOS 4795; 16 Feb. 1927, west of Fellsmere, Hoy Coll. 7/3; 10 March 1927, west of Fellsmere,

DMNH 10690, UWGB N3 1/27; 13 March 1927, Fellsmere Marsh, MNHUPS 36/3; 3 April 1927, Wolf Creek, Brevard Co., DMNH 5159; 15 April 1927, St. Johns Marsh SW of Malabar, Hoy Coll. 41/2; 20 April 1927, SW of Malabar, Brevard Co., SBCM 17479; 22 April 1927, St. Johns Marsh at Ten Pines, Hoy Coll. 38/3, south of Nickel Camp, Brevard Co., MNHOS 4794, south of Hillard Maple, WFVZ 17387; 22 May 1927, [probably headwaters of St. Johns], DMNH 10693; 10 March 1928, 32 km SW of Fellsmere, Indian River Co., CM 144497; 2 April 1929, Fellsmere, male FMNH 160215, female FMNH 156765, male FMNH 156767; 6 May 1929, 11 km SW of Fellsmere, male FMNH 160216, male FMNH 160217, female FMNH 156766; 10 April 1930, 16 km SW of Grant, male CM107475, 13 km SW of Malabar, CM 2593; 15 May 1930, Fellsmere Marsh, AMNH 15858; 11 April 1931, 19 km NW of Fellsmere, AMNH 15464, 32 km SE of Malabar, AMNH 6959; 19 April 1931, St. Johns Marsh, Brevard Co., MVZ 5156, 16 km NW of Fellsmere, AMNH 15463; 2 May 1931, 18 km NW of Fellsmere, AMNH 15462; 12 March 1933, 180 m south of State Road 60, Indian River Co., unsexed chick MCZ 252441; 18 Feb. 1934, 24 km west of Vero Beach, AMNH 15860; 19 March 1934, 24 km west of Vero Beach, AMNH 15859.

SEBASTIAN RIVER—28 March 1898, male (mounted) OSM 5443.

WACISSA RIVER—Wayne (1895) secured about 20 specimens (14 of which are listed below): April 1894, male Charleston Mus. 912, unsexed Charleston Mus. 913, unsexed Charleston Mus. 914; 9 May 1894, [loc. spec. unk.] (Wayne 1895), [loc. spec. unk.] (Wayne fn, Charleston Mus.); 10 May 1894, female Charleston Mus. 30-147-93, male Chicago Acad Sci. 3077, 2 males [loc. spec. unk.] (Wayne fn, Charleston Mus.); 21 May 1894, female and 2 unsexed juv. [loc. spec. unk.] (Wayne fn, Charleston Mus.), male MCZ 245757, male Chicago Acad Sci. 3084.

WEKIVA RIVER—2 July 1876, male FMNH 37652; 5 July 1876, male USNM 72815.

Table 1.
Curated collections with Snail Kite material from Florida.

Curatorial Institution	Skins/ Mounts	Eggs Sets	Total
Acad. Nat. Sci. Philadelphia (ANSP)	3	1	4
Amer. Mus. Nat. Hist. (AMNH)	15	19	34
British Mus. Nat. Hist. (BMNH)	13	1	14
Dan B. Bull Collection, Calif.		2	2
California Acad. Sci. (Calif. AS)	2	1	3
Carnegie Mus. Nat. Hist. (CM)	5	4	9
Charleston Mus.	4	1	5
Chicago Acad. Sci. (CAS)	3	1	4
Clemson Univ. (CU)		2	2
Delaware Mus. Nat. Hist. (DMNH)	3	12	15
James B. Dixon Collection, Calif.		1	1
Field Mus. Nat. Hist. (FMNH)	28		28
Florida State Mus. (UF)	1	2	3
Nelson Hoy Collection, Pa.[¹]		16	16
Milwaukee Public Mus. (MPM)	3		3
Mus. Comparative Zool., Harvard Univ. (MCZ)	24	8	32
Mus. Nat. Hist., Oregon State Univ. (MNHOS)		5	5
Mus. Nat. Hist., Univ. Iowa (MNHUI)	1		1
Mus. Nat. Hist., Univ. Puget Sound (MNHUPS)		4	4
Mus. Vertebrate Zool., Univ. Calif., Berkeley (MVZ)	7	3	10
Mus. Zool., Univ. Michigan (UMMZ)	9		10 ^[2]
Natl. Mus. of Canada (NMC)		1	1
Ohio State Mus. (SM)	1		1
Peabody Mus. Nat. Hist., Yale Univ. (PMNH)	3		3
Princeton Mus. Nat. Hist., Princeton Univ. (PMZ)	3		3
Royal Ontario Mus. (ROM)	2		2
San Bernardino County Mus. (SBCM)		6	6
San Diego Nat. Hist. Mus. (SDNHM)	1		1
Santa Barbara Mus. Nat. Hist. (SBMNH)		3	3
Barton M. Snyder Collection, Pa.		2	2
U. S. Natl. Mus. Nat. Hist. (USNM)	23	19	42
Univ. Miami (UM)	2		2
Univ. Wisconsin, Green Bay (UWGB)		2	2
Virginia Polytechnic Institute (VPI)	2	2	4
Western Foundation of Vertebrate Zool., Calif. (WVZ)		30	30
Zool. Institute, Acad. Sci., Leningrad, U.S.S.R	1		1
Total	36	158	308

[¹] Acquired by WFVZ in 1980.

[²] Also includes one skeleton.

Table 2.
The 33 Florida counties in which the Snail Kite has been recorded
(*breeding 1844-1967, †1968-1980).

Alachua*	Highlands	Palm Beach*†
Brevard*†	Indian River*†	Pinellas
Broward*	Jefferson	Polk
Citrus	Lake*	Putnam*
Collier*	Lee*	St. Lucie*†
Dade*†	Manatee	Sarasota
DeSoto	Marion	Seminole
Duval	Monroe*	Sumter*
Flagler	Okeechobee	Taylor
Glades*†	Orange	Volusia
Hendry*	Osceola	Wakulla*

Table 3.
Summary of Snail Kite material from Florida by county of origin.

County	Skins/ Mounts	Eggs Sets	Total
Alachua		1	1
Brevard	12	21	33
Broward	5	2	8 ^[1]
Collier	2		2
Dade	22	12	34
Dade-Broward ^[2]	1	25	26
DeSoto	2		2
Glades	4	18	22
Indian River	14	21	35
Jefferson	7		7
Lee-Hendry ^[3]	2	5	7
Manatee	2		2
Monroe		7	7
Osceola	3		3
Palm Beach	23	24	47
Pinellas	1		1
Putnam		1	1
Seminole	2		2
Sumter	22		22
State of Florida ^[4]	35	11	46
Total	19	159	308

[¹] Includes one skeleton at MS.

[²] Broward County was once part of Dade; label data insufficient to determine in which county material originated.

[³] Hendry County was once part of Lee; label data insufficient to determine in which county material originated.

[⁴] Insufficient data of label to place in a specific county.

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