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OCCURRENCE OF PRESUMED LUCIFER X BLACK-CHINNED HUMMINGBIRDS IN TEXAS

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Hummingbirds are known to hybridize and a wide assortment of combinations has been documented. There have been at least 18 hybrid combinations reported in the United States and the majority of these have been intergeneric (Banks and Johnson 1961, Short and Phillips 1966, Howell 2002). Hybrids involve almost all species of hummingbirds occurring in the United States. Many hybrid combinations have only been reported a few times, causing some observers to consider such events as very rare (Banks and Johnson 1961).

Figure 1. Male presumed Lucifer x Black-chinned Hummingbird from Alpine, Brewster County, Texas from 10 July 2007. Note body plumage generally typical of a Black-chinned Hummingbird with an elongated violet-magenta gorget.

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However hybridization does occur with greater frequency in hummingbirds than in many other families of birds (Howell 2002).

The Black-chinned Hummingbird (*Archilochus alexandri*) is the most common and widespread breeding hummingbird occurring in Texas (Lockwood and Freeman 2004). Hybrids involving this species have been documented with other species of hummingbirds with sympatric breeding ranges in the western United States. Specimen records of hybrids involving Black-chinned Hummingbirds include Broad-tailed, *Selasphorus platycercus* (Banks and Johnson 1961), Anna's, *Calypte anna* (Banks and Johnson 1961), Costa's, *Calypte costae* (Short and Phillips 1966), and Allen's Hummingbirds, *Selasphorus sasin* (Lynch and Ames 1970). Other hybrid individuals presumed to involve this taxon have been photographed and measured. These include hybrids with Ruby-throated, *Archilochus colubris* (B. Sargent pers. comm.) and Calliope Hummingbirds, *Stellula calliope* (S. Peterson pers. comm.). The Lucifer Hummingbird (*Calothorax lucifer*) has also been presumed to hybridize with the Black-chinned Hummingbird, although there are no known specimens of this combination. No other hybrid combinations involving Lucifer Hummingbirds have been reported.

OCCURRENCE OF PRESUMED LUCIFER X BLACK-CHINNED HUMMINGBIRD HYBRIDS IN TEXAS

In the United States, Black-chinned Hummingbirds and Lucifer Hummingbirds are sympatric as breeding species in only two areas. The largest of these is in Texas and includes the foothills of the Chisos Mountains and very likely the Christmas Mountains of southern Brewster County. The other is in southeastern Arizona (Williamson 2001, Howell 2002). Despite this limited contact zone, this hybrid combination appears to occur fairly regularly in the southern Trans-Pecos of Texas. There are at least 13 reports of presumed Lucifer Hummingbird x Black-chinned Hummingbird hybrids, all males, from Texas. The first reported observation was in Blue Creek Canyon, Big Bend National Park, Brewster County, on 8 May 1986 (Scott 1994) and the first photographic record was from El Paso, El Paso County, from 13–15 July 1996 (Lasley et al. 1996). Since then, separate individuals of this hybrid combination were reported on four occasions from the central Davis Mountains, Jeff Davis County (M. Eastman, pers. comm.), at least five times within Big Bend National Park, Brewster County (M. Flippo, pers. comm.), once from the northern Christmas Mountains, Brewster County (Lockwood et al. 2007), and once in Alpine, Brewster County (M. Lockwood, pers. ob.). All birds outside of Big Bend National Park were from a period of post-breeding dispersal from mid-July through August. The individuals noted in Big Bend National Park were primarily observed at feeding stations at Panther Junction which is within the breeding habitat of both species.

DESCRIPTION OF MALE HYBRIDS

Photographs of four individuals were examined, two of which were observed. None of these birds was captured and measured and no specimen was collected. All were similar in size and structure to the Black-chinned Hummingbird. In general, all four individuals shared the following characteristics. The gorget was violet-magenta to rose-magenta with a grayish chin (Fig. 1). The auriculars were dusky and all had a prominent whitish post-ocular spot. Most had a prominent whitish collar narrowing to a grayish central breast stripe. The crown was dusky-olive brightening to green on the nape and upperparts. The underparts were grayish heavily marked with dull green on the sides. The tail was forked with green central retricies (Fig. 2). The bill was of medium length.

Variations in the gorget shape, tail length, and bill shape have been noted. The shape of the gorget of hybrids is intermediate between the presumed parental types. In all individuals, the gorget is somewhat elongated and outside the variation seen in Black-chinned Hummingbirds (Fig. 3). One individual exhibited a gorget with corners similar to a typical male Lucifer. The second feature with considerable variation is tail length. In general, the tail of hybrids is similar in structure to a male Lucifer. Tail length varied from only slightly longer than a typical Black-chinned to near that of a typical Lucifer. Bill shape has varied from straight to slightly decurved.

Figure 2. Same individual as in Figure 1, photo taken on 22 July 2007. As is typical of these hybrids, this bird has a gray, non-iridescent chin and a forked tail. In this individual the tail is similar in length to that of a typical Black-chinned Hummingbird.

Figure 3. Male presumed Lucifer x Black-chinned Hummingbird from the central Davis Mountains, Jeff Davis, Texas from 22 July 2006. This individual has a slightly decurved bill and a more elongated gorget than the bird shown in Figures 1 and 2.

DISCUSSION

Even with the relatively small sample size of individuals of this hybrid combination, there is considerable variation in a few characteristics yet surprising similarities in others. This is not unexpected and greater variation could be described with additional observations. The characteristics of the Black-chinned parent have been more strongly expressed in most individuals. The greatest variation has been in gorget shape and tail length. These plumage characters have been intermediate between the parental species. This supports observations by Banks and Johnson (1961) of hummingbird hybrids in general.

Most hybrid combinations in hummingbirds are fairly rare events. With at least 13 separate individuals sharing characteristics of Lucifer Hummingbird x Black-chinned Hummingbird, this presumed combination appears to occur at a higher frequency than might be expected. Greater awareness will undoubtedly lead to additional reports of these birds. This highlights the need to photograph strange-looking hummingbirds for documentation purposes.

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SURVEY FOR BLOOD PARASITES IN FLEDGLING REDDISH EGRETS ALONG THE TEXAS COAST

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The Reddish Egret (*Egretta rufescens*) is the least-studied species of heron in North America. It inhabits coastal wetlands along the Gulf of Mexico, in the Caribbean and Bahamas, along the Atlantic Coast of Florida, and along the Pacific Coast of Mexico (Paul 1991). This species has undergone several population fluctuations within the last century. Reddish Egrets were nearly extirpated in the early 1900s by plume hunters, experienced a modest recovery (~3,200 pairs), then declined to <600 pairs in the 1960s due to unknown causes. There are about 2,000 pairs in the United States with 75% believed to occur in Texas (Paul 1991). The Reddish Egret remains rare compared to other heron species and is completely dependent on coastal wetlands. Therefore, it is listed as a species of concern by the U.S. Fish and Wildlife Service and has been designated as threatened by the State of Texas (Office of migratory bird management 1995, Texas Parks and Wildlife Department 2007).

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Haemoproteus sp., *Plasmodium* spp., and *Leucocytozoon* sp. have been reported in various species of wading birds (Conti et al. 1986, Telford et al. 1992). However, little is known about the occurrence of blood parasites in Reddish Egrets because of limited sampling on this rare species. Consequently, the potential effect blood parasites may have on this species is also unknown. Therefore, our study was designed to determine whether fledgling Reddish Egrets from coastal areas of Texas are infected with blood parasites using blood smears and, if they are, determine species composition, prevalence, and abundance. Reddish Egrets were captured, handled, and sampled under permits of the U.S. Fish and Wildlife Service (Permit No. MB121162-0) and Texas Parks and Wildlife Department (Permit No. SPR-0106-005).

We captured 43, eight to ten week old Reddish Egret fledglings by hand from five breeding colonies along the Texas coast during spring 2006. Only live birds were sampled as no dead fledglings were observed in which we could make tissue impression smears. Consequently, host sampling did not include dead birds and sampled birds may be biased towards a healthier portion of the population. Fledglings were chosen because they are immunologically naive and, therefore, would most likely demonstrate patent infections. Additionally, infections found in fledglings would indicate acquisition of parasites in Texas. We sampled blood from the brachial vein of each bird and made two blood smears. The smears were air-dried, fixed in methanol, and stained with Diff-Quik®. We examined each smear for 5 min at 400x magnification to look for microfilarids, and for 10 min at 1,000x magnification to search for blood protozoans (*Haemoproteus* sp., *Plasmodium* spp., and *Leucocytozoon* sp.). We found no blood protozoans or microfilarids in the 43 individuals examined.

In this study, we collected blood smears of juvenile Reddish Egrets in late spring, a period in which there is an abundance of potential vectors in the region. Additionally, Reddish Egrets nest in colonies with other species of herons, that are known to be hosts for hemoparasites such as Great Blue Heron (*Ardea herodias*) and Tri-colored Heron (*Egretta tricolor*) (Telford et al. 1992, Forrester and Spalding 2003). This group behavior of several species of hosts could concentrate vectors and facilitate transmission among susceptible host individuals. However, no blood parasites were found. It is possible that the fledglings were too young for the blood parasites to appear in the blood. However, Telford et al. (1992) found a 19-day-old Ardeid infected by a species of *Plasmodium* and a 10- to 15-day old Ardeid infected by a species of *Haemoproteus*. This suggests that the 8–10 week old fledglings examined in our study were of sufficient age to demonstrate infections in blood smears. Because of the difficulty in detecting *Plasmodium* spp. using the blood smear technique (Herman et al. 1966), infections might have been missed. However, this does not account for the lack of other blood protozoans such as *Haemoproteus*. Additionally, because of the status of the Reddish Egret at the state and federal level, taking tissue impression smears was not a viable option, thereby negating this method to detect tissue stages of certain blood protozoans. Possibly, Reddish Egrets are more resistant to infection than other Ardeids. Conti et al. (1986) and Telford et al. (1992) examined a limited number of blood smears from hatch-year Reddish Egrets. Neither study detected infected individuals. However, their sample sizes were small, 9 individuals and 3 individuals, respectively. If there is a low prevalence, larger sample sizes would be required to detect infections. Our study examining 43 Reddish Egrets represents the largest number sampled to date.

Another possibility for the lack of blood parasites involves the nesting habitat of the Reddish Egret. Greiner et al. (1975) suggested that the prevalence of blood parasites may be correlated with the vertical stratification of nesting sites and that species using an intermediate vertical nesting stratum have a higher prevalence of blood parasites. Along the lower Texas coast, we noticed that Reddish Egrets often nest on the ground or in low vegetation (Lowther and Paul 2002 and references within). However, the Great Blue Heron often uses higher nesting sites and seems to be more commonly infected than other Ardeids that use lower nesting sites.

In conclusion, this study represents the largest published survey for blood parasites in Reddish Egrets. Our findings suggest that blood parasites were absent in fledgling Reddish Egrets or at least the birds were not demonstrating active infections during a period characterized by elevated densities of potentially susceptible hosts occurring within breeding colonies.

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LAND USE PATTERNS AND HISTORICAL CHANGES IN THE STATUS OF THE WESTERN BURROWING OWL IN SOUTHERN TEXAS

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ABSTRACT.—Populations of the Western Burrowing Owl (*Athene cunicularia hypugaea*) have declined throughout much of their range in western North America. Breeding Bird Survey data indicate that numbers of breeding Burrowing Owls currently are stable in Texas, however, they no longer breed in large portions of their former range, including southern Texas. We investigated the historical status of the Western Burrowing Owl in southern Texas by reviewing accounts of early ornithological collecting expeditions, examining species accounts and reviews, and gathering information from museum specimens collected in Texas. Burrowing Owls were widespread and relatively abundant in coastal prairies until brushland became the dominant ecosystem in southern Texas in the 1890s. Clearing of brush for agricultural development in the early 1900s allowed Burrowing Owls to persist as winter residents in southern Texas. They were extirpated as breeders by about 1950. The status of Burrowing Owls on managed grasslands of private ranches in southern Texas remains unknown.

Populations of the Western Burrowing Owl (*Athene cunicularia hypugaea*) have declined throughout much of their North American range. The subspecies was classified as federally threatened in Mexico in 1994 and federally endangered in Canada in 1995.

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In the United States, the U.S. Fish and Wildlife Service designated the subspecies as a National Bird of Conservation Concern in 2002 (Klute et al. 2003). Western Burrowing Owl populations are designated as endangered, threatened, or a species of concern in nine of 19 U.S. states and all four Canadian provinces in which they occur.

In seven of the remaining 10 U.S. states in which the subspecies occurs, it is considered vulnerable or potentially vulnerable (Klute et al. 2003). Much of this decline across North America may be attributed to loss of habitat, as grasslands have been converted to row crop production (Haug et al. 1993, Sheffield 1997), and loss of suitable burrows due to widespread eradication of prairie dogs (*Cynomys* spp.) and large ground squirrels (*Spermophilus* spp.) (Desmond et al. 2000, Klute et al. 2003).

Texas is one of only three states in which the subspecies is considered stable, largely because of the healthy status of breeding populations in the Texas panhandle and western Texas (McIntyre 2004, Sauer et al. 2005). However, large portions of the former breeding range of the Western Burrowing Owl in north-central, central, and southern Texas (Fig. 1) no longer support breeding individuals (Wellicome and Holroyd 2001).

Population trend data from Christmas Bird Counts (CBCs) in Texas indicate a statistically significant winter decline statewide from 1960–2000 (McIntyre 2004). Much of western Texas is recognized as established or potential winter range of Western Burrowing Owls (McIntyre 2004), and Burrowing Owls have been documented in scattered counties of central and southern Texas, and along the Gulf Coast, during winter (Jones 2001, McIntyre 2004).

Little research has been conducted on the winter ecology of Burrowing Owls, and Holroyd et al. (2001) identified this as a high-priority research need. An extensive research effort on the winter ecology of Burrowing Owls in a five-county (Nueces, Kleberg, San Patricio, Refugio, and Jim Wells) area in southern Texas was undertaken in 1999-2004 (Woodin et al. 2007). As part of that larger study, we investigated historical accounts and records of Western Burrowing Owls in southern Texas dating back to the mid-19th Century.

Figure 1. Current and historical breeding range of the Western Burrowing Owl (Wellicome and Holroyd 2001).

METHODS

We searched for references to Burrowing Owls by reviewing 14 published accounts of early ornithological expeditions to southern Texas. We also examined three comprehensive syntheses of species accounts. In addition, we contacted 25 museums in North America which were likely to have Burrowing Owl specimens from Texas in their collections.

EARLY ORNITHOLOGICAL EXPEDITIONS

Anecdotal evidence of the occurrence of breeding Burrowing Owls in southern Texas exists in accounts of early ornithological expeditions. Dresser (1865–66) observed that Burrowing Owls were "noticed at all seasons in the prairie-country," but this reference to grasslands was generalized to include the immense region from San Antonio southward. Several specimens were collected by Dresser (1865–66) near San Antonio and Eagle Pass. Chapman (1891) did not report any sightings of Burrowing Owls during the spring near Corpus Christi, but his collecting activities were confined largely to Tamaulipan thorn scrub and marshes, habitats generally unsuitable for Burrowing Owls. Singley (1892) collected birds during the spring in the vicinities of Corpus Christi, Rio Grande City, and Hidalgo, but he did not report seeing or shooting any Burrowing Owls. Following a late spring and summer collecting trip, Rhoads (1892) bemoaned the "complete disappearance of this common and characteristic bird from the region of Corpus Christi." However, Peirce (1894) described "many burrowing owls" occurring in pairs on a collecting trip along the north shore of Corpus Christi Bay. His description of owl pairing behavior and the timing of these observations (in April) suggested that these owls probably were breeding birds. Griscom and Crosby (1925–26) reported Burrowing Owls were known to breed in the vicinity of Corpus Christi, but they considered the Burrowing Owl had an uncertain status from Brownsville north to the sand plains of Kenedy County. No Burrowing Owls were reported by Sennett (1878, 1879), De Laubenfels (1924), or Friedmann (1925) during spring and summer expeditions in the lower Rio Grande Valley, or at any time of the year by Smith (1910).

Other accounts from early collecting expeditions provided anecdotal evidence of Burrowing Owls wintering in southern Texas. Merrill (1878) considered Burrowing Owls to be "rather abundant during the winter months" along the lower Rio Grande Valley, and Beckham (1887) reported Burrowing Owls as "abundant" near Corpus Christi in winter. Carroll (1900) also reported that Burrowing Owls in Refugio County (north of Corpus Christi) were "very common during the winter months". He added that he had been told by others that Burrowing Owls also bred in Refugio County, although he expressed some skepticism on this.

COMPREHENSIVE SPECIES ACCOUNTS

Packard (1951) reviewed existing information on Burrowing Owls along the central Texas coast and concluded that breeding populations probably no longer existed in southern Texas. He also noted that Burrowing Owls still occurred in southern Texas in winter, but they had declined in numbers. Packard (1951) observed that Burrowing Owls were "found on the prairies remaining north of Rockport and on the King Ranch and in a few other places." Oberholser (1974) documented confirmed (skins or eggs in collections) and sight records of both breeding and wintering Burrowing Owls in Texas and established that Western Burrowing Owls formerly bred in the coastal plain from near Houston to Kleberg County. Oberholser (1974) also reported one breeding record in Kleberg County (map, p. 454) in southern Texas. The text, however, attributed the southernmost known nesting record in Texas to Nueces County (p. 455). Winter records of Burrowing Owls in southern Texas cited in Oberholser (1974) were clustered around Corpus Christi and the lower Rio Grande Valley.

Despite an intensive review of nesting reports and records of birds in the lower Rio Grande Valley, Brush (2005) did not locate records of nesting Burrowing Owls. This species apparently was never a part of the breeding avifauna of the lower Rio Grande Valley.

MUSEUM SPECIMENS

Responses from 24 museums yielded 115 Burrowing Owl records from Texas, but many were from the northern portion of the state. Table 1 shows locations of specimens of Burrowing Owls collected in southern Texas. Most museum records from southern Texas were non-breeding birds from Cameron County ($n = 23$) in the lower Rio Grande Valley and from Nueces County ($n = 10$). Of special note is an egg set collected in Kleberg County in 1922 (Catalog No. 142886, Western Foundation of Vertebrate Zoology). This may be the breeding record cited in Oberholser (1974) we previously referenced.

Table 1. Numbers of specimens of Burrowing Owls from southern Texas in museum collections. Specimens, unless noted otherwise, are skins.

Institution and Location	Number
Academy of Natural Sciences of Philadelphia Philadelphia, PA	5
American Museum of Natural History New York, NY	5
Carnegie Museum of Natural History Pittsburgh, PA	5
Corpus Christi Museum of Science and History Corpus Christi, TX	4
Dallas Museum of Natural History Dallas, TX	1
The Field Museum of Natural History Chicago, IL	7
Museum of Comparative Zoology Harvard University, Cambridge, MA	9
Museum of Natural Science Louisiana State University, Baton Rouge, LA	2
The Peabody Museum of Natural History Yale University, New Haven, CT	1
Rob & Bessie Welder Wildlife Foundation Sinton, TX	4
The Texas Cooperative Wildlife Collection Texas A&M University, College Station, TX	3[1]
Western Foundation of Vertebrate Zoology Camarillo, CA	1[2]

[1]Includes one skeleton
[2]Egg set collected April 13, 1922 in Kleberg County

DISCUSSION

Before extensive settlement by Europeans and North Americans, great expanses of coastal and inland grasslands occurred across much of southern Texas (Dresser 1865–66, Johnston 1963, Inglis 1964, Smeins et al. 1991). Southern Texas prairies were populated by herds of grazing and browsing mammals, including white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), and bison (*Bison bison*), although the latter species seemingly had become quite rare after the 1700s (Inglis 1964, Smeins et al. 1991). In the 1800s, large herds of wild horses and feral cattle were prominent across the prairies of southern Texas (Olmsted 1857, Inglis 1964, Mier y Terán 2000).

Extensive portions of southern Texas likely resembled the open grasslands of the Great Plains of the interior of North America. Inglis (1964) found diaries and reports by past travelers across southern Texas often used glowing adjectives such as "excellent," "tall," "extensive," and "luxurient" to describe the prairie grasses. An occasional exception to the norm was noted by those travelers passing through an area recently burned by prairie fires (Inglis 1964). As Western Burrowing Owls are characteristically grassland and desert birds across their North American range (Haug et al. 1993), southern Texas probably represented suitable habitat for the owls.

In most of their range, Western Burrowing Owls often are associated with abandoned burrows of prairie dogs and other large ground squirrels (e.g., California [*Spermophilus beecheyi*] and Richardson's ground squirrels [*Spermophilus richardsonii*]), which provide nesting and roosting sites for owls (Haug et al. 1993). No evidence exists to indicate that either prairie dogs or large ground squirrels ever occurred in southern Texas

Figure 2. Western Burrowing Owl in southwestern McMullen county after being flushed from its roostsite in a pile of concrete rubble. Photo Larry Lloyd.

grasslands. Therefore, Burrowing Owls in southern Texas probably used abandoned burrows of other burrowing mammals, such as badgers (*Taxidea taxus*) and coyotes (*Canis latrans*). Nine-banded armadillos (*Dasypus novemcinctus*), while prodigious excavators, did not arrive in Texas until the early 1890s, although by 1900 they were considered common as far north as the vicinities of Beeville and San Diego (Schmidly 2002). Since these mammals do not possess a colonial social structure, their burrows are not clustered like colonies of prairie dogs and ground squirrels. Thus, Burrowing Owl populations in southern Texas may never have been as dense as those associated with burrowing rodent species. Nevertheless, in southern Texas grasslands, Burrowing Owls apparently occurred year-round (except for the lower Rio Grande Valley) in substantial numbers well into the second half of the 19th Century (e.g., Dresser 1865–66, Merrill 1878, Beckham 1887).

By the late 1890s, however, Burrowing Owls had become much more difficult to locate in their former haunts in southern Texas (Singley 1892, Rhoads 1892). These observations on the sharp decline in numbers of Burrowing Owls coincided with an increase in woody species, principally honey mesquite (*Prosopis glandulosa*), in grasslands of southern Texas (Bogusch 1950). This change transformed the once extensive grasslands of southern Texas into dense brush (Smeins et al. 1991).

Suppression of prairie fires and decades of grazing by large herds of sheep and cattle are considered the major factors contributing to the emergence of brushlands as the dominant ecosystem in much of southern Texas (Johnston 1963, Lehmann 1969, Smeins et al. 1991, Schmidly 2002). This region, now known as the Tamaulipan Biotic Province (Blair 1950), is dominated by thornscrub, Chapman (1891) and Rhoads (1892) remarked on the rapid transformation of the landscape, suggesting that a critical threshold, perhaps related to frequency or intensity of fires, had been crossed, which resulted in alteration of the ecosystem. One possible scenario for such a landscape-scale transformation is that decades of heavy grazing by sheep and cattle had reduced the forage to such an extent that the prairie grasses could no longer provide the fuel to sustain fires of sufficient intensity to hold honey mesquite and other brush species in check (Schmidly 2002).

With the conversion of grasslands to brush in southern Texas, Burrowing Owl populations declined in the region and probably disappeared entirely from much of southern Texas (Singley 1892, Rhoads 1892). Even so, Burrowing Owls persisted locally in places where grasslands remained (Carroll 1900, Packard 1951). These remnant prairies probably continued to undergo occasionally intense prairie fires, some of which may have been ignited intentionally to control woody species on large private ranches. Burrowing Owls also persisted locally in grasslands of the coastal sand plains of Kenedy County (Oberholser 1974), where sandy soils were more resistant to the establishment of woody species.

Burrowing Owls also found refuge in unusual places, inhabiting burrows in the steep sides of an eroded gulley or cliff in San Patricio County (Peirce 1894). Burrowing Owls frequently use unusual roost sites, such as natural rock cavities within extruded lava flows and under rock outcrops in Idaho (Gleason and Johnson 1985, Rich 1986), under poured concrete surfaces in California (Trulio 1997) and Texas (Williford et al. 2007), and in piles of concrete debris and dirt in Texas (Jones 1999, Williford et al. 2007).

The arrival of large, steam-powered tractors in southern Texas during the early part of the 20th Century opened the era of brush clearing for the development of agriculture, and, once again, large portions of the southern Texas landscape were transformed. Native brushlands across large areas were replaced by fields cleared for production of mostly cotton and sorghum, while in the lower Rio Grande Valley, citrus, vegetable crops, and sugarcane became prominent (Jahrsdoerfer and Leslie 1988).

The development of agriculture in southern Texas almost certainly benefited Burrowing Owls (Bellocq 1997, York et al. 2002). As dense brushland was converted to cropland, expansive vistas somewhat reminiscent of open plains reappeared. Insects (some of them crop pests) and small mammals, both of which are common prey of Burrowing Owls (Haug et al. 1993) probably became more available to owls foraging in roadsides and other remnant, untilled, open areas. Roadside culverts, installed for drainage improvements along county and farm roads, provided atypical roost sites for Burrowing Owls (Williford et al. 2007).

The ability to adapt to the highly modified environment of agricultural ecosystems allowed the Western Burrowing Owl to persist as part of the winter avifauna of southern Texas, although they apparently were extirpated as breeding birds sometime between the early 1920s and about 1950 (Packard 1951). No evidence of recent breeding by Burrowing Owls in southern Texas was reported by Benson and Arnold (2001).

Burrowing Owls in farmlands in southern Texas are dispersed widely (Jones 2001). They usually occur as lone individuals scattered across extensive, tilled fields that lay dormant during winter. This characteristic has contributed to the low numbers of Burrowing Owls reported for Christmas Bird Counts (CBCs) in Texas (McIntyre 2004). CBC reports almost certainly underestimate numbers of Burrowing Owls in winter. CBCs are distributed unevenly geographically, and detection of Burrowing Owls wintering in agricultural systems is often problematic because CBC participants seldom spend much time in areas dominated by intensive agriculture. These estimates, however, can be increased through outreach to rural landowners (Jones 2001) and by focusing search efforts in agricultural areas in coastal counties (Woodin et al. 2007) and in the lower Rio Grande plain (Brush, pers. comm.).

The status of Burrowing Owls on remaining grasslands in southern Texas is largely unknown, since most of this land is privately owned and, hence, largely inaccessible. Continued efforts to document Burrowing Owls on private ranchlands, through surveys or public outreach, would no doubt further our understanding of the status of these owls in southern Texas.

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USE OF NATURAL AND SUBURBAN SAVANNAS BY BREEDING BIRDS OF THE LOWER RIO GRANDE VALLEY OF TEXAS

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ABSTRACT.—Although not extensively studied, several bird species use natural or suburban savannas during the breeding season in the Lower Rio Grande Valley of Texas. Most species that use natural savannas are also found in more intensively managed suburban savannas, such as ball fields, golf courses, and school campuses. Species using savannas are those which can forage effectively in open spaces and which can successfully nest there, in the face of high predation pressure. Birds dependent on foraging in dense foliage and flying relatively short distance are not as successful in savannas. A few species, such as Loggerhead Shrike (*Lanius ludovicianus*) and Tropical Kingbird (*Tyrannus melancholicus*) have established breeding populations in suburban savannas. Although savannas do not support as many unique tropical bird species as riparian forest and thorn forest, they add to the regional bird diversity of the Lower Rio Grande Valley.

Savannas, for the purposes of this paper, are areas dominated by grass with widely scattered trees. Much of South Texas, including the northern sections of the Lower Rio Grande Valley (LRGV), was once savanna (Johnston 1963, Fulbright 2001). Unlike the more famous riparian forests, wetlands and thorn forests of the LRGV, bird use of savannas has been studied little. Bird species which occur in savanna often occur in grasslands, but the presence of elevated foraging and nesting sites may attract other species. I have seen some parallels between natural savannas and artificial, suburban savannas such as school campuses, golf courses, open parks, and office parks. I became interested in exploring patterns of habitat use, particularly the original habitats of species regularly seen in suburban and natural savannas and what factors might influence habitat use. I present a qualitative summary and discussion of birds using savannas in the LRGV of southernmost Texas, where I have lived and worked since August 1991.

Natural savannas on the northern fringes of the LRGV were (and are) dominated by mesquite (*Prosopis glandulosa*), with a few oak (*Quercus virginiana*) and other woody plants. They are relatively dry, with sandy soils and short grass (Brush 2005). Somewhat wetter savannas with taller grass occur in coastal areas. Such coastal savannas often have large patches of Gulf cordgrass (*Spartina spartinae*) and merge into coastal

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wetlands of varying salinities (Judd and Lonard 2002). Yuccas (*Yucca treculeana*) and mesquite are typical woody plants. Formerly, natural savannas were maintained by fire and light grazing (Johnston 1963), but heavy grazing favored invasion by woody plants into savannas and grasslands (Smith 1899, Jackson 2000). Artificial savannas are maintained by mowing.

Natural savannas are attractive to several species of birds that may be absent from areas of denser woody vegetation, such as thorn-scrub, thorn-forest, and riparian forest. There is extensive overlap between bird communities of savannas and grasslands. However, many bird species which are typical grassland birds do not venture regularly out into savannas.

With all the changes that have occurred in the LRGV and across South Texas, much natural savanna has been lost. Some areas have been cleared for farming, while others (in the absence of fire or the occurrence of over-grazing) have been converted into thorn-scrub, thorn-forest, or other woodlands. Although we know little of historic changes in bird communities in South Texas, we know many savanna and grassland species do not use areas with dense woody vegetation. However, we are learning that some savanna species will use suburban savannas, such as golf courses, school campuses, and office parks.

In this paper, I describe patterns of habitat use for some breeding bird species in the LRGV, focusing on how regularly they use natural and suburban savannas, in comparison with their other habitats (Table 1). I include species only if they were assessed as uncommon or common, during the breeding season, in suburban or natural savannas. I did not include widely ranging species only seen flying over various habitats, such as Turkey Vulture (*Cathartes aura*) or Cave Swallow (*Petrochelidon fulva*). For the purposes of this paper, riparian ecosystems include riparian forest, associated wetlands, and riverbanks. Agricultural ecosystems include row crops such as sorghum, sugar cane, cotton, corn, winter vegetables, and similar crops, whether irrigated or not. Suburban savannas include school campuses, office-parks, golf courses, city parks, and other areas having widely scattered trees and grass kept short by regular mowing. Other, more well-known habitats are defined as in Brush (2005). In the absence of quantitative information such as bird counts, I assessed the status of bird species, based on my experience living and traveling across the Valley from 1991 to 2007.

Some species, such as Tropical Kingbird and Loggerhead Shrike, have established breeding populations in suburban savannas but not in natural savannas. Others, such as Cassin's *(Aimophila cassinii)* and Black-throated *(Amphispiza bilineata)* sparrows and Northern Bobwhite *(Colinus virginianus)* occur in natural savanna but not suburban ones. However, most birds which regularly use suburban savanna are also regular in natural savanna or agricultural areas. Although this is not surprising, as all those habitats are similar in physical structure (Figs. 1–3), it is worth exploring the reasons why.

Birds which are able to forage effectively in suburban savanna or agricultural areas are adapted to seeking and capturing food in open space. Many of these species, such as Western and Tropical kingbirds and nighthawks, capture flying insects in midair. They can forage easily in the open spaces of school campuses, and the more open city parks, but they might have difficulty maneuvering in the "close quarters" of thorn forest and the denser riparian forest. They also benefit by having perches from which to watch for prey, which would be scarcer in pure grassland or the middle of large agricultural fields. Similarly, birds which sally from exposed perches to capture food on the ground can also forage effectively in both natural and suburban savannas. For example, the Loggerhead Shrike may fly more than 100 m from a perch, staying close to the ground, before it captures its prey by surprise. Northern Mockingbirds usually fly less than 20 m from a perch, but can move easily on the ground. Both these species find it harder to forage in areas with tall grass or dense foliage, where flying or moving near the ground is much more difficult. In contrast, Cassin's and Black-throated sparrows forage in areas with taller grass, where more food (seeds) may be available.

Species which forage by carefully searching in dense foliage, such as Green Jays (*Cyanocorax yncas*), White-eyed Vireos (*Vireo griseus*), Olive Sparrows (*Arremonops rufivirgatus*), and Altamira Orioles (*Icterus gularis*), would have to fly longer distances in between food sources in savannas. These species forage by gleaning food from surfaces and have relatively short wings, better suited for maneuvering in dense foliage than covering long distances effectively. Many other species simply lack foraging opportunities in savannas or agricultural areas, unless other habitats are created within them. For example, Buff-bellied Hummingbirds (*Amazilia yucatanensis*) and Carolina Wrens (*Thryothorus ludovicianus*) lack nectar sources and dense, brushy tangles, respectively. Finally, cavity-nesting species such as Golden-fronted Woodpeckers

Table 1. Habitat use by breeding birds of savannas and other habitats in the Lower Rio Grande Valley of Texas. Because it would add greatly to the length of the table, I do not include species whose presence in suburban savannas is dependent on wetlands or ponds or whose use of savannas is irregular. C = seen regularly, in moderate to large numbers; U = seen regularly, in small numbers; R = seen rarely, in very small numbers; V = populations vary greatly from year to year; WM = present mainly or exclusively in winter or migration, for whole species or population within specified habitat.

	Natural savanna	**Thorn scrub**	**Thorn forest**	**Suburban savanna**	**Riparian ecosystem**	**Agricultural areas**
Black-bellied Whistling-Duck *Dendrocygna autumnalis*				C	C	U
Northern Bobwhite (V) *Colinus virginianus*	U	U	U		U	U
White-tailed Kite (V) (*Elanus leucurus*)	U			U		
Killdeer *Charadrius vociferus*	R			U	C	C
Rock Pigeon *Columba livia*				C		C
Eurasian Collared-Dove *Streptopelia decaocto*				U		U
White-winged Dove *Zenaida asiatica*	U	U	C	C	C	C
Mourning Dove *Zenaida macroura*	C	C	C	C	C	C
Inca Dove *Columbina inca*				C		U
Common Ground-Dove *Columbina passerina*	C	U		R		U
Lesser Nighthawk *Chordeiles acutipennis*	C			C		
Common Nighthawk *Chordeiles minor*	U			C		
Vermilion Flycatcher *Pyrocephalus rubinus*	U			U(WM)		
Tropical Kingbird *Tyrannus melancholicus*				R		R
Western Kingbird *Tyrannus verticalis*				C		C
Scissor-tailed Flycatcher *Tyrannus forficatus*	C			C		
Loggerhead Shrike *Lanius ludovicianus*	U(WM)			U		R
Purple Martin *Progne subis*				C		
Northern Mockingbird *Mimus polyglottos*	C	C		C		U
Curve-billed Thrasher *Toxostoma curvirostre*	C	C		U		
European Starling *Sturnus vulgaris*				C		C
Cassin's Sparrow *Aimophila cassinii*	U					
Lark Sparrow *Chondestes grammacus*	C			C		U

Table 1. (*Continued*)

	Natural savanna	Thorn scrub	Thorn forest	Suburban savanna	Riparian ecosystem	Agricultural areas
Black-throated Sparrow *Amphispiza bilineata*	U?	U?				
Eastern Meadowlark *Sturnella magna*	C			U(WM)		U
Great-tailed Grackle *Quiscalus mexicanus*	U	R		C	C	C
Bronzed Cowbird *Molothrus aeneus*	U	U	C	U(WM)	C	C
Brown-headed Cowbird *Molothrus ater*	U	C	U	R?	U	C(WM)
House Sparrow *Passer domesticus*				C		C

(*Melanerpes aurifrons*) and Brown-crested Flycatchers (*Myiarchus tyrannulus*) typical lack suitable nest-sites in savannas and agricultural areas. There are exceptions to all the above patterns; for example the use of dead palm trees *(Washingtonia sp)* and telephone poles or fenceposts by Golden-fronted Woodpeckers in otherwise treeless savanna (and thorn scrub). Altamira Oriole may nest in savanna-like areas, as long as suitable, dense foraging areas are available nearby.

A final distinction between birds capable of using savannas or agricultural areas regularly is their level of aggressiveness. Predation by Great-tailed Grackles (*Quiscalus mexicanus*), domestic cats (*Felis catus*)

Figure 1. Natural savannas typically have widely scattered mesquite or yucca in a "sea" of grass. Such areas may be maintained by grazing or fire, and are otherwise susceptible to invasion by woody plants. Photo by Steve Bentsen.

and other predators may deter species relying on nest concealment, such as Summer Tanagers (*Piranga rubra*), Painted Buntings (*Passerina ciris*), and many others. In contrast, species which aggressively defend their nesting territories may do well. Examples include Northern Mockingbird, kingbirds, and Loggerhead Shrikes. Male Great-tailed Grackles effectively defend their territories, which may contain several nests attended by females.

In some cases, we are left wondering at why certain habitat choices are made. Curve-billed Thrashers are regular in natural and suburban savannas, while Long-billed Thrashers (*Toxostoma longirostre*) are restricted to the densest suburban "forests" and gardens if some shrubs were present most similar to their preferred thorn forest and riparian forest. Likewise, Couch's Kingbird (*Tyrannus couchii*) avoid savannas and agricultural areas, regularly used by Western and Tropical kingbirds. Couch's Kingbirds are most common in thorn forest and riparian forest, although they will regularly use denser suburban habitats. In both the kingbird and thrasher examples, the species are very similar to each other physically, so the "choice" may be a behavioral one to avoid competition.

Topics not covered in this paper, but which deserve study, are 1) use of savannas by wintering birds and 2) effects of exotic, invasive grasses such as buffelgrass (*Pennisetum ciliare*) and guineagrass (*Urochloa maxima*) on habitat use by birds in the LRGV. Igl and Ballard (1999) provided some baseline information on abundance and habitat use of non-breeding birds in a variety of grassland and woodland habitats in the Sand Plains (Brooks, Jim Wells, Kenedy, and Kleberg counties), in the central part of South Texas. Of the permanent residents mentioned in this study, Eastern Meadowlarks were the only species classified as a grassland (by their definition including savannas) specialists, but Igl and Ballard (1999) also found it common in shrub-grasslands. Loggerhead Shrikes, Lark Sparrows, and Cassin's Sparrows, and Brown-headed Cowbirds were listed as shrub-grassland specialist, but were also regular in grasslands. In a warm-season, Flanders et al. (2006) showed that overall abundance of breeding birds was greater on sites dominated by native grasses in the northwestern part of South Texas in their brush-grassland study sites. In contrast, in Arizona, Botteri's Sparrows heavily used exotic lovegrasses (*Eragrostis* spp.), which provided dense cover for fledglings (Jones and Bock 2005). Similar research should be done in natural and suburban savannas of the LRGV and other parts of South Texas and northeastern Mexico.

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Figure 2. Artificial savannas are typically intensively used parks, school campuses and office parks in cities and towns, which are maintained by regular mowing and weed control. Such areas have high densities of potential nest predators. Photo by author.

Figure 3. Some species, such as the Loggerhead Shrike, have established breeding populations in artificial savannas in the Lower Rio Grande Valley. Such species tolerate or require ample open space between trees, to locate and capture prey. Photo by Alan Murphy.

E. F. POPE: COLLECTOR AND CRAFTSMAN

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ABSTRACT.—Edmond Floyd Pope (1870–1952) collected birds' eggs in Texas and other locations from the mid-1880s through the late 1920s. He was also an inspector for the predatory animal control division of the United States Biological Survey, a master craftsman of the longbow, and a breeder of flying squirrels for the pet market. Several of Pope's egg records have been questioned in recent years. He is, however, still considered to have been an expert in the manufacture of the longbow. This paper chronicles the life of E. F. Pope with a focus on his contributions to the ornithology of Texas.

Ornithologists today remember E. F. Pope for his egg collections made during the mid-1880s through the late 1920s. Known to even smaller audiences is his work as a predatory animal control inspector, a master craftsman of the longbow, and breeder of flying squirrels for the pet market. Several of Pope's egg records have been questioned in recent years. He is, however, still highly regarded by historians of traditional archery. This paper reviews the life and work of E. F. Pope with an emphasis on the contributions that he made to the ornithology of Texas.

EARLY LIFE AND EXPERIENCES

Edmond Floyd Pope, eldest son of Dickerson 'Dick' and Ann Parsons Pope, was born in Tyler County, Texas, on 9 November 1870. His childhood was passed on the family farm near the community of Mobile, and he was presumably educated in the public schools of Tyler County. How he became interested in nature or if there were mentors who encouraged his endeavors is unknown.

Floyd Pope was a member of the last generation to witness the grandeur of the bird life in eastern Texas. In his 70th year, he could still recall seeing during his childhood a large flight of Passenger Pigeons (*Ectopistes migratorius*), as well as a flock of several hundred Carolina Parakeets (*Conuropsis carolinensis*) (Baker 1956). Perhaps inspired by these early experiences, he began to collect birds' eggs around 1885. An egg of a Passenger Pigeon taken in Tyler County during 1887 is the earliest known specimen credited to Pope (Casto 2001).

A SKILLED AND DETERMINED COLLECTOR

Pope quickly developed the skills necessary for collecting and preparing eggs and, as he gained experience, he became particularly focused on the eggs of raptors. This attraction was perhaps motivated by the higher market value of these eggs, and the fact that their retrieval from nests in seemingly inaccessible locations required ingenuity and daring. The tenacity that Pope exhibited when confronted by an obstacle in obtaining a prized set of eggs is illustrated by the following account of his collection of the eggs of a Swallow-tailed Kite (*Elanoides forficatus*) (Pope 1913).

On the morning of 10 May 1889, Pope set out to search for kite nests in the bottoms of Billums [Billiams] Creek some 4 or 5 miles from his home. A nest was soon found in a large cypress some 10 feet in diameter. The trunk quickly tapered to about 8 feet and remained this size for about 40 feet until it flattened to about 10 feet wide and 4 feet thick. The trunk then divided into two prongs about 4 feet in diameter that extended upward another 100 feet. The nest was located near the top of one of the prongs where a branch had broken off and the vertical sprouts and their horizontal offshoots provided a platform for its support.

Pope evaluated the situation and then hurried home to get his bow and arrows, a couple hundred feet of silk line, an equal amount of strong cord, and about 100 feet of manila rope. After returning to the nest tree, he found it necessary to climb two adjacent trees and chop off branches in order to get a straight-line shot with the arrow. The silk line was then attached to the arrow and, after some 20 attempts, he managed to pass the arrow through the crotch formed by the two prongs. The cord was then attached to the silk line, and it was pulled upward toward the crotch. However, the silk line soon snagged on the rough surface of the crotch. Afraid that the line would break,

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Pope climbed a nearby tree to a height well above the crotch where, after pulling upward on the line it was freed and the cord was pulled through the crotch. Knots were then tied in one-half of the manila rope, which was then attached to the cord and pulled through the crotch. The rope, however, was too short, a dilemma remedied by attaching a generous length of stout grape vine to the bottom end, which was then tied to a nearby tree. Then, strapping on his climbers, Pope quickly ascended the knotted rope to the lip of the crotch only to find that his progress was blocked by a large outgrowth from the trunk. However, with some maneuvering this obstacle was overcome, and he fell exhausted into the crotch. After resting for a short period, he quickly ascended to the branch on which the nest was located. The two eggs were placed in a small box padded with Spanish moss and lowered to the ground. Measurement of the string used to lower the box showed the nest was 155 feet above the ground.

MARRIAGE AND FARMING

Around 1896, Floyd Pope married Piety Leona Cruse. To provide for his new wife, Pope purchased 75 acres of land that he cultivated and on which he grazed a few cattle. The farm was on good soil with the potential of supporting a family but Pope was not cut out to be an agriculturalist. His son, Frank, would later recall that his father let the land grow up in weeds and bushes while he devoted his time to the collection of eggs and other natural history items (Pope 1971). For the next 13 years, Pope divided his time between farming and his passion for collecting.

Pope's eldest son, Cragg, born in 1896, was followed by a second son, Frank, born in 1898. The need to provide for two small children may have been the stimulus for Pope to advertise in the August-October 1898 issue of *The Oologist* that during the next season [1899] he would have "for sale and exchange many sets from this state [Texas]." Although he probably traded in eggs before 1898, this advertisement seems to signal his intention to turn his hobby into a commercial venture. Pope continued to farm at Mobile and to collect in the surrounding vicinity until at least 1909. All of his known egg records before 1909 are from Tyler County (Duncan 2005) with the exception of those of a Zone-tailed Hawk (*Buteo albonotatus*) taken at Marathon, Texas (Reed 1904:161).

NEW MEXICO AND COLORADO

The Pope family moved to New Mexico sometime during 1909. At the time of the 1910 census they were living in Vaughn, New Mexico, and Floyd was working as a laborer on the railroad. The exact nature of this work is unknown but it must have allowed considerable time for collecting. In fact, Pope's records for this year show that he collected in New Mexico and Texas, as well as in the Mexican states of Guanajuato, Nuevo Leon, and Sinaloa (Duncan 2005). It is unknown whether the collections made in Mexico were personal expeditions or if Pope was commissioned to do this work.

Pope did not remain in New Mexico for long. During 1911, he was living in Trinidad, Colorado (Anon. 1911), and presumably still working for the railroad. His collection records for 1911 show eggs taken in California, Colorado, New Mexico, Washington, and the Mexican states of Nuevo Leon, Sinaloa, and Vera Cruz (Duncan 2005).

WORK ON BOLIVAR PENINSULA

Pope left Colorado and returned to Tyler County sometime during early 1911. He did not, however, resume full-time farming. Instead, he soon departed for the Texas coast where he made intermittent observations on Bolivar Peninsula from 26 July l911 through late March 1913 (Simmons 1914). In an advertisement in the April 1912 issue of *The Oologist*, Pope requested that his "oological friends . . . submit [their] list of wants from Southern Texas." His address at this time was Port Bolivar, Texas.

Pope made important contributions to the knowledge of Rails on the Texas coast. On 9 May 1912, he collected eggs of the Black Rail (*Laterallus jamaicensis*), the first documentation for breeding of this species in Texas (Oberholser 1974). From 20 November 1912 through March 1913, he camped in a deserted two-story building located on the bay shore of Bolivar Peninsula. Clapper Rails (*Rallus longirostris*) were abundant on the peninsula, and Pope spent considerable time observing their habits. George Finlay Simmons later incorporated Pope's "voluminous notes" into his pioneering paper on the natural history of this species (Simmons 1914). In addition, Pope also submitted to the Bureau of the Biological Survey his notes on the birds seen in the vicinity of Flake Station, 8 miles northeast of Port Bolivar (Oberholser n.d.:957).

Figure 1. **Edmond Floyd Pope** (1870–1952). Egg collector, inspector for the predator animal control division of the biological survey, master craftsman of the longbow, and raiser of flying squirrels for the pet market. Photograph from the January 1920 issue of *The Oologist*.

Figure 2. **Floyd Pope** (right) in his workshop showing Capt. Fred Mills of the Boy Scouts a billet from which a longbow would be made. Photograph circa 1940s courtesy of Ray Quigley.

DESIRE TO BE AN ORNITHOLOGIST

Pope considered himself an "ornithologist" rather than just an egg collector. In order to gain acceptance and perhaps also to promote his trade in eggs, he actively sought membership in the major ornithological societies. Membership was dependent upon being "proposed" or sponsored by someone who was already a member. Pope must, therefore, have had friends who considered him a person of integrity with the potential to make significant contributions to ornithology. His sponsor for membership in the Wilson Ornithological Club during 1911 is unknown. However, in 1913, Henry Ward Carriger, then president of the northern division of the Cooper Ornithological Club, proposed his membership in that group (Storer 1913). In the following year, Pope was elected as an associate member of both the Cooper Ornithological Club and the American Ornithologists' Union. Strangely, even though he was a member of the three major ornithological societies, he never published in any of their journals. His papers were instead published in *The Oologist*, a trade journal for those interested in the collection, sale, and exchange of eggs. Pope's determination to be remembered as an ornithologist persisted long after he abandoned the collection of eggs. In fact, his death certificate lists his occupation as "ornithologist."

COLLECTING AND THE BIOLOGICAL SURVEY, 1913-1929

Pope lived in the community of Colmesneil in Tyler County from 1913 through 1919. Each spring he traveled extensively searching for eggs. During 1913, collections were made in the Texas counties of Ector, Kerr, Lavaca, Medina, Pecos, Stratford, and Sutton, as well as in the Arizona counties of Cochise and Santa Cruz (Duncan 2005). This pattern of travel was continued in subsequent years and often included areas outside of Texas such as Alberta, Canada (1915), British Columbia, Canada (1916), Arizona (1916), and New Mexico (1916-1919). Significant Texas records from this period include eggs of the Common Black-Hawk (*Buteogallus anthracinus*) taken in Webb County during 1913 and egg sets establishing the last known breeding of the

White-tailed Hawk (*Buteo albicaudatus*) in Lavaca (1913) and Medina (1914) counties (Oberholser 1974).

Pope is believed to have begun working for the Predatory Animal Control Division of the United States Biological Survey during late 1919. The 1920 census lists the Pope family as living in Albuquerque, New Mexico, where the district headquarters of the control division was presumably located. As a way of announcing his change of residence to his customers and exchange partners, Pope's photograph and new address were published in the January 1920 issue of *The Oologist* (Fig. 1).

Pope's duties as an inspector involved considerable travel to assess the need for predator control and assign trappers to take care of the problem. States comprising his district included New Mexico, Oklahoma, Missouri, and Arkansas (Pope 1971). This job apparently allowed little free time to collect eggs. In fact, no records have been found of eggs collected by Pope during 1921, 1923, 1924, 1927, 1928 and only a single record from 1922, the eggs of a Peregrine Falcon (*Falco peregrinus*) collected in Arkansas. Collections during 1925, 1926, and 1929 were all made in New Mexico (Duncan 2005).

LONGBOWS AND SQUIRRELS

The last year that Pope was employed by the United States Biological Survey seems to have been 1929. This year also appears to have been the last in which he collected eggs or evidenced any interest in birds. By the time of the 1930 census, he had returned to Texas and was living with his wife in a house just outside of Woodville in Tyler County. For unknown reasons, Pope decided to retire at the age of 60. Frank Pope would later state that his father had an accident several years before his death resulting in a concussion from which he never completely recovered (Pope 1971). If indeed his balance and coordination had been affected, it may have impaired his ability to climb trees in search of eggs.

Pope learned to use the longbow early in life for hunting and as an aid in securing lines to limbs that could not be reached in any other way. In this latter sense, the bow was little more than a tool to facilitate the collection of eggs. However, Pope later began to experiment in the manufacture of bows, and by the early 1920s was supplying other enthusiasts with bois d'arc billets and staves for making longbows (Huntington 2002). The bois d'arc that Pope used for making bows was obtained from a secret location in southern Oklahoma, and the arrows were made from cedar obtained from British Columbia, Canada. By the 1940s, Pope had acquired a reputation as a master craftsman, and his bows were sold to individuals throughout the United States and as far away as Saudi Arabia (Baker 2006, Bowen 2006).

Pope also raised flying squirrels and sold them as pets. His first advertisement for the sale of squirrels was placed in the June 1936 issue of *Nature Magazine*. For $3.00 Pope supplied a mated pair and a booklet describing their care. His business establishment was called "Wildwoods Fur Farm," a somewhat misleading name for the sale of creatures intended as pets. Rollin Baker, who interviewed Pope in 1940, recalls that the squirrel colony was kept in one end of an old barn. Pope, then 70 years of age, was still an impressive physical specimen—"tall . . . at least six feet or more . . . not too fleshy . . . [and] soft spoken." Although the two men talked at length about the animal life in early Texas and Pope's work with the biological survey, Pope made no mention of his former interest in birds' eggs (Baker 2006).

LOSS OF EGGS AND FIELD NOTES

Around 1940 or 1941, Fred F. Nyc, Jr. and Arthur Merritt, Jr., met with Pope at Ingleside, Texas, where they spent a couple of hours discussing birds' eggs. By this time, Pope had quit collecting several years earlier and had disposed of most of his eggs, except 20 or 30 sets of common species which were kept in an old trunk (Nyc 1968). Nothing is known of Pope's activities during the last decade of his life. He died in Rusk State Hospital on 8 June 1952 and was buried in Pilgrim Rest Cemetery in Tyler County. His collection of eggs was stored in an outhouse following his death and remained there until salvaged by his son, Frank, sometime around 1969. Insects and mice had damaged many of the eggs and data cards (Pope 1971). The location of the salvaged eggs and Pope's field notes is unknown. Pope's earliest notes on the birds of eastern Texas were destroyed in a fire sometime prior to 1913 (Pope 1913).

NATURAL HISTORY OBSERVATIONS

Pope's observations on the Swallow-tailed Kite suggest that he had a particular interest in the behavior of birds. Kites were once abundant and considered a nuisance in Tyler County because of their fondness for young

mockingbirds. Although Pope had often seen kites robbing the nests of mockingbirds, he never observed them robbing the nests of other species. Kites were also seen to sweep down and grab the nests of paper wasps and then, while floating around in the air, to eat the young wasps at their leisure. Small "green snakes" and anoles were also prey items of the kites in eastern Texas (Pope 1913).

Pope's observations on the vocalizations, feeding, and mortality of the Clapper Rail were also unique. He found that the birds were most vocal in the late afternoon and just before dusk, and that they seemed to become much more noisy in the hours preceding the arrival of a 'norther'. The best time to observe feeding of the rails was after a strong north wind had forced water out of the bay exposing more of the mud flats. The secretive rails would then emerge from the marsh grass to feed on the flats. The rails were often seen to cooperate in hunting crabs—"The rails eagerly ate fiddler crabs, usually removing the large claw before devouring the victim. This was generally accomplished by one bird holding the crab while another removed the objectionable limb." Pope also noted that the eggs and young of the rails suffered a high rate of predation from raccoons, opossums, and minks whereas the adult rails were often caught in steel traps set in the pathways used by mink (Simmons 1914).

The method by which a female Wood Duck conveyed her young to the water was a chance observation made by Pope while fishing on the Nueces River in southeastern Texas. When Pope arrived on the scene, three or four ducklings were already in the water. Suddenly, a female Wood Duck (*Aix sponsa*) emerged from a cavity some 28 feet above the water with a duckling on her back. The female dropped straight down toward the water using her wings to slow the speed of descent. Then, when only a foot or two above the water, the female assumed a vertical position causing the duckling to slide from her back onto the water. The female then rose, circled a time or two and reentered the cavity, a performance that was repeated until all 10 of her brood were in the water (Bent 1923).

Some species, such as Tropical Kingbird and Loggerhead Shrike, have established breeding populations in suburban savannas but not in natural savannas. Others, such as Cassin's (*Aimophila cassinii*) and Black-throated (*Amphispiza bilineata*) sparrows and Northern Bobwhite (*Colinus virginianus*) occur in natural savanna but not suburban ones. However, most birds which regularly use suburban savanna are also regular in natural savanna or agricultural areas. Although this is not surprising, as all those habitats are similar in physical structure (Figs. 1–3), it is worth exploring the reasons why.

CONSERVATION CONCERNS

Pope was aware that human activities were having a deleterious effect on birds, and he was particularly concerned by the decline of vultures in eastern Texas (Pope 1916). In 1903 the Texas legislature removed vultures from the list of protected species at the insistence of ranchers who believed that they were carriers of anthrax in cattle. Based on this false premise, vultures were shot, trapped, and poisoned by the thousands (Casto 1988). Pope mistakenly believed, as did the cattlemen, that vultures spread anthrax. However, he was also convinced that they were a vital link in the economy of nature and that they provided a valuable service by removing carrion, a potential source of contamination for humans and other animals. The solution to this problem, according to Pope, was not the extermination of vultures but instead the immunization of cattle against anthrax. Pope was convinced that vultures were on the road to extinction, and he advised oologists to take special care of their vulture eggs since they would undoubtedly increase in value with the passage of time (Pope 1916).

The Yellow-throated Warbler (*Dendroica dominica*) was another of Pope's concerns. Yellow-throats were common in Tyler County during the 1880s but its numbers had progressively declined since that time. This decline was attributed to the removal of the large sycamores and sweet gums as the bottomlands were cleared for cultivation (Pope 1917).

Pope had strong feelings on extinction, and he considered the extermination of the Great Auk (*Pinguinus impennis*), Passenger Pigeon, and Carolina Parakeet to be a "hideous blot on [the] Republic" (Pope 1916). However, even though Pope was acutely aware of the dangers facing Texas birds during the early 20th Century, there is no evidence that he belonged to any of the conservation organizations.

CONTROVERSIAL RECORDS

The total number of egg sets collected by Pope during his career is unknown. However, a survey has determined that over 500 of his sets are still in existence (Duncan 2005). These sets are located in nine institutions: Carnegie Museum of Natural History, United States National Museum, Field Museum of Natural History,

Richter Museum of Natural History, Yale Peabody Museum, Museum of Vertebrate Zoology at Berkeley, Burke Museum of Natural History and Culture, California Academy of Sciences Museum of Natural History, and the Western Foundation for Vertebrate Zoology. It is likely that additional eggs collected by Pope may yet be found in private collections and at other institutions.

Floyd Pope seems to have been well regarded by his contemporaries. He was elected to membership in all three major ornithological societies, an unusual status for someone who was an "egg collector." Attesting to his generosity in allowing others the use of his field notes and observations are the acknowledgments of Frank L. Burns (1911) and George Finlay Simmons (1914) in their respective studies on the Broad-winged Hawk (*Buteo platypterus*) and Clapper Rail. Rollin Baker's assessment of Pope following two interviews with him during 1940 was that he was one of the most "field savvy" individuals that he had ever met (Baker 2006).

Pope's Texas records, with the exception of a set of Pyrrhuloxia (*Cardinalis sinuatus*) eggs taken in Tyler County during 1898, seem to have been accepted at face value by Oberholser (1974). Other authorities have not been so generous. Pope has been described in the literature as a "known egg faker," a label that does not precisely identify his supposed transgressions (Bechard and Houston 1984). Specific records that have been challenged include eggs of a Rough-legged Hawk [doubtful] taken in Colorado during 1911, eggs of a White-tailed Hawk (*Buteo lagopus*) [doubtful] taken near Vaughn, New Mexico during 1909 (Farquhar 1992), and three clutches of Common Black-Hawk eggs [misidentification?] taken in Arizona during 1917 (Schnell 1994).

It is probable that Pope occasionally misidentified eggs. Whether he systematically falsified his collection data is a question that can be resolved only by an examination of his travel itinerary and field notes. With the absence of these documents and the likelihood that they will never become available, each of his records must be evaluated on its individual merits.

ACKNOWLEDGMENTS

Ray Quigley graciously supplied copies of his correspondence with Frank Pope and F. F. Nyc. Russell Duncan made available his database of the eggs collected by E. F. Pope. Rollin Baker shared his personal recollections of Pope. The contributions of these three individuals are gratefully acknowledged. I also thank Horace Burke and John Hubbard for their comments and suggestions during my research.

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SHORT COMMUNICATIONS

A UNIQUE BREEDING COLONY OF CATTLE EGRETS AND NEOTROPIC CORMORANTS IN NORTH CENTRAL TEXAS

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In north central Texas, Cattle Egrets (*Bubulcus ibis*) and Neotropic Cormorants (*Phalacrocorax brazilianus*) often nest together and with other species of colonially-nesting herons, egrets, and ibises. Nesting colonies are established in early spring by native species and are joined by Cattle Egrets most of which arrive two-three weeks later; and, by midsummer, are the major species in colonies since the native species have, by that time, mostly finished nesting. In some years, Neotropic Cormorants will also use the colonies for fall nesting, but other species do not (Telfair and Morrison 2005). Therefore, a new breeding colony of Cattle Egrets and Neotropic Cormorants established at the same time and in mid-summer has not been reported until now (Telfair and Morrison 2005, Telfair 2006).

On 30 June 30 2007, I noticed a large number of Cattle Egrets in pastures on the Rosewood Ranch, Inc. in southeast Ellis County along FM 85 about 0.8 km west of the Ellis/Navarro county line. The ranch contains many gravel pits and crayfish/waterfowl impoundments. During breeding season, pastures, especially when flooded, and gravel pits and impoundments are often used as feeding areas for cormorants, herons, egrets, and ibises; but, until 2007, have not had any nesting colonies (Kenneth Braddock, pers. comm.).

During recent years, this region of Texas has experienced dry springs and summers and, as a result, exposed peripheral and island areas of gravel pits and impoundments have developed stands of black willow (*Salix nigra*) which have grown rapidly and closely spaced. On 7 July 2007, I observed a small colony of Cattle Egrets and Neotropic Cormorants building and sitting on nests in the willows that had grown along the periphery of a small (1.5 ha) peninsula in a 6.4 ha gravel pit about 0.19 km north of FM 85 right-of-way (32° 18' 24.22" N, 96° 26' 08.68" W). The pit had filled with water as a result of the prolonged spring/summer rains in 2007 and the islands were inundated. A large number of adult and immature White Ibis (*Eudocimus albus*) were perched in trees over the colony and were seen in flight; but, no nests were seen. Apparently, they had nested earlier elsewhere and were using the area for feeding only. Also, observed at the colony were Great-tailed Grackles (*Quiscalus mexicanus*); no nests were seen but probably were present. On 8 July, no ibises were seen. On 14 July, an adult Little Blue Heron (*Egretta caerulea*) and a Great Egret (*Ardea alba*) were observed flying over the colony. On 15 July, only nesting Cattle Egrets and Neotropic Cormorants were seen. On 21 July, a spotting scope was used to census the colony. There were about 150 egret nests interspersed with 18 cormorant nests. On 28 July, an adjacent stand of willows contained about 30 egret and eight cormorant nests. On 4 August, the number was stable (about 180 egret and 26 cormorant nests).

Both Cattle Egrets and Neotropic Cormorants usually begin nesting in early April (Telfair and Morrison 2005, Telfair 2006); and, they usually nest among other colonial waterbird species. Thus, this late-nesting colony containing only the two species is unusual. In some years, Neotropic Cormorants also breed in the fall in addition to spring breeding (Telfair and Morrison 2005). So, this late breeding colony of Cattle Egrets may have stimulated the breeding by this group of cormorants.

The nearest known breeding colony of colonial waterbirds is Cedar Creek Islands Wildlife Management Area in Cedar Creek Reservoir about 24 km east in Henderson County. There, Cattle Egrets and Neotropic Cormorants nest with Great Egrets, Little Blue Herons, Snowy Egrets (*E. thula*) , Tricolored Herons (*E. tri-*

color), and Black-crowned Night-Herons (*Nycticorax nyticorax*).

The young fledged and left the colony between 22-29 September. However, this phenology is still within the span of the breeding season in Texas for both Cattle Egrets (early April to late-September (normal) or late October (late) and Neotropic Cormorants (early April to late-September (normal) or late December (late) (Telfair and Morrison 2005, Telfair 2006).

I thank Mr. K. Braddock, Manager of the Rosewood Ranch, Inc. for providing geographic and historical information.

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AN UNUSUAL BARN SWALLOW NEST

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The Barn Swallow (*Hirundo rustica*) usually builds a nest of distinct layers of mud pellets and grass stems. Birds seem to prefer building on top of a ledge or other protruding objects from the substrate, probably to give the nest more support; but, often where there is nothing underneath, the nest is attached to the wall solely by its sides. Construction begins by making a narrow mud shelf, large enough for the bird to sit on, and the, builds up the sides. When attached to a vertical wall, the nest has a semicircular half-cup shape (Brown and Brown 1999).

In mid-June 2007, an atypical Barn Swallow nest (Fig. 1) was constructed on the back porch of Mark and Monica Jones in Ellis County in a hay field agricultural area bordering State Highway 34 about 11.3 km northeast of Ennis. The unusual aspect of the nest was a long vertical central column that extended 17.8 cm along the wall to a horizontal molding strip. Construction began at the molding strip; proceeded upward along the column; then, terminated with nest construction of typical shape and size. The nest was attached near the

Figure 1. Atypical Barn Swallow nest (photo courtesy of Mark, Daniel, and Monica Jones). The yellow scale is a carpenter's rule measured in inches.

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edge of a vented panel at the bottom of which a chain was attached to hold a wind chime. So, mud attachment should not have been a problem. Therefore, the function of the column is not clear. Measurements were: from rim of nest to concrete floor of porch (2.47 m), space between nest and ceiling (3.8 cm), width of nest cup (15.2 cm), height of nest cup (8.2 cm), height of column (17.8 cm), width of column (9.5 cm), and thickness of column (3.8 cm).

A clutch of five eggs was laid; but, they disappeared in early July, probably as result of snake predation; and, the nest was abandoned. Texas Rat Snakes (*Elaphe obsoleta lindheimeri*) are commonly seen in the vicinity (Mark Jones pers. comm.).

I thank Mark Jones for informing me about this unusual nest.

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SWAINSON'S THRUSH (*CATHARUS USTULATUS*) CAUGHT IN WEB OF GOLDEN SILK ORB WEAVER (*NEPHILA CLAVIPES*)

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Hurricane Humberto passed through High Island, Galveston County, Texas on 13 September 2007. On 16 September 2007, while inspecting damage and cleaning foliage debris along trails at the Houston Audubon Society's Boy Scout Woods Nature Sanctuary, we noticed a Swainson's Thrush (*Catharus ustulatus*) caught in a web of a Golden Silk Orb Weaver (*Nephila clavipes*) at 1545 h. We immediately rescued the bird, trapped in an upside down position a little above the center of the web, which measured approximately 0.8 m in diameter. We inspected the bird and it appeared in good condition with moderate fat levels on the breast. Upon release the bird flew approximately 20 m in a curved-arc flight path approximately 1.3 m above the ground before disappearing behind vegetation.

The case of a bird this large being trapped in a web is rarely documented. *Catharus ustulatus* weigh approximately 20–30 g, whether migrating through Texas (HMNS VO 2001) or the South American tropics (Brooks et al. in press).

Densities of spider webs at lower forest strata may increase following a hurricane or tropical storm that diminishes the upper canopy. We noticed a high density of active *N. clavipes* at sanctuaries in the region following category 1 Hurricane Humberto. While the effects of hurricanes in northern subtropical forests have often documented direct causes to species population declines (e.g., Willig and Gannon 1994), we document a case of an indirect negative effect to a species due to a natural catastrophe. The reduced canopy from the hurricane can lead to increased densities of Orb Weaver webs at lower forest strata, which could ostensibly trap more migrant songbirds that are more active in the lower strata.

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WHITE-WINGED DOVES NESTING IN PALM TREES

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White-winged Doves (*Zenaida asiatica*) are medium sized New World columbids that ranges from southwest U.S. thorough Mexico and south throughout Central America (Small et al. 2006). In recent years, breeding populations of White-winged Doves have become established throughout most of Texas with the largest population occurring in San Antonio (Schwertner et al. 2002, West 1993). Herein I report the use of palm trees for nesting by White-winged Doves in an urban lot in San Antonio, Texas.

The lot (.08 ha) contains a mix of trees including wax leaf ligustrum (*Ligustrum japonicum),* pecan (*Carya illinoinensis)*, southern magnolia (*Magnolia grandiflora)*, netleaf hackberry (*Celtis laevigata var. reticulata),* Arizona ash (*Fraxinus velutina)*, Texas mountain laurel (*Sophora* secundiflora) and numerous Mexican fan palms (*Washingtonia robusta*).

Prior to 2006, monthly nest searches revealed White-winged Doves nesting in pecan, hackberry, and ash but not in ligustrum, magnolia, and palms. In 2006, a dove constructed a nest at the base of a palm leaf (Fig.1). Two young successfully fledged from the nest, which was then reused. Because the doves were not marked, it is not know if the same pair renested in the palm. In 2007 a nest was discovered on the blade of a palm leaf (Fig.2) as well as the same location as the 2006 nest. A search of 14 palms revealed three additional nests. All were in the base of the petiole of the palm leaf. A literature review documented only a single case of a White-winged Dove nesting in a palm (Alamia 1970). The petiole of the Mexican fan palm is covered along the margins with curved thorns (Henderson et al. 1995) which may provide defense against predators. While domestic cats have been observed in various trees at the site they have never been observed in palms. Another possibility explaining the use of palms as nesting sites is their continued presence of leaves. This continual green cover allows nest construction before native deciduous trees have produced leaves, thus providing cover and making them attractive nest sites. (Small per comm.).

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Figure 1. Nest with egg at base of palm leaf petiole.

Figure 2. Nest with eggs on surface of palm leaf.

[1]E-Mail: jce@cstbinc.org

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Use the following abbreviations: sec (second), min (minute), h (hour); report temperature as °C (i. e., 15° C). In text, do not abbreviate day, week, month, or year; months should be abbreviated in figures and tables. Define and write out acronyms and abbreviations the first time they appear in text; abbreviate thereafter: "Second-year (SY) birds . . . We found SY birds in large numbers."

Present all measurements in metric units. Use continental dating (i. e., 15 August 2007), the 24-hour clock (i. e., 0500, 1230), and local standard time. Specify time as Standard Time (i. e., CST for Central Standard Time) at first reference to time of day. **Study site location(s) should be identified by latitude and longitude**. Present latitude and longitude with one space between each element (i. e., 28° 07' N, 114° 31' W). If latitude and longitude are not available indicate the distance and direction from the nearest permanent location. Abbreviate and capitalize direction (i.e., north = N, southwest = SW, or 5 km W Abilene, Taylor County). Also capitalize regions such as South Texas or Southwest United States.

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rev. 05-Oct-2007

ERRATUM

Fernando Cerra's name was mistakenly printed as Fernando Cena in *Texas Birds Annual* 2007. We regret the error. editor

Sanctuary Fund Request

TOS Members,

This summer we nearly doubled the size of our sanctuary at Magic Ridge near Indianola in Calhoun County. This purchase was the result of many years of hard work and donations from many TOS members. Next spring we are planning a dedication in conjunction with a TOS field trip to this special part of the Texas coast. The only negative associated with this purchase is it now leaves our *Sanctuary Fund* depleted.

For this reason, TOS is seeking donations[1] to reseed the general *Sanctuary Fund* with $10,000 or more. Although not as compelling as the purchase of an entire piece of property. these funds are important for the following reasons.

- It will allow timely acquisition of small tracks of land as they become available at auction. This can mean adjacent lots to existing property or in some cases lots surrounded or nearly surrounded by TOS property.
- Maintenance of existing facilities including water for bird-attracting drips and young live oaks at Magic Ridge (estimated at $1000/year) and tallow control at Schroeder Island. Fortunately, user fees now offset such expenses at High Island and Sabine Woods.
- Improvement of existing properties. Planting a motte can cost upwards of $10,000.
- Emergency funds to cover unexpected legal issues.

This fund drive has already been kicked off by Ted Eubanks who saw the need before we could even ask and donated the first $1000. Checks should be made out to TOS with *Sanctuary Fund* indicated on the information line.

Send them to: **Texas Ornithological Society**
1508 Red Oak Cove
Schertz, TX 78154

Thanks for your consideration and see you in the field!

Ron Weeks

Ron Weeks
TOS President

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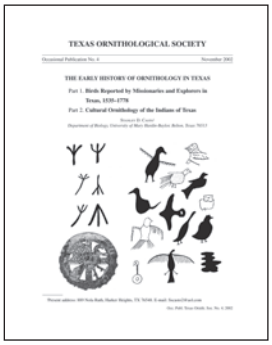

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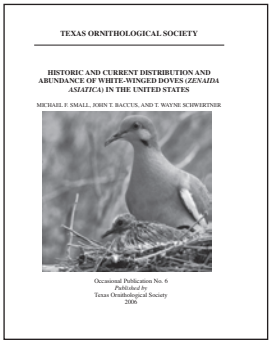

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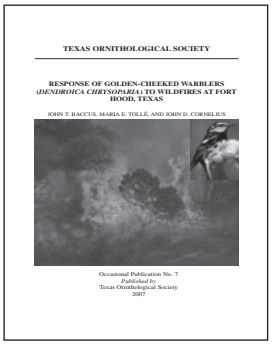

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