

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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