

THE AVIFAUNA OF PÁLPITE, CIÉNAGA DE ZAPATA, CUBA, AND THE IMPORTANCE OF THE AREA FOR GLOBALLY THREATENED AND ENDEMIC BIRDS

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Resumen.—LA AVIFAUNA DE PÁLPITE, CIÉNAGA DE ZAPATA, CUBA, Y LA IMPORTANCIA DEL ÁREA PARA AVES GLOBALMENTE AMENAZADA Y ENDÉMICO. Presentamos aquí los resultados de trabajo de campo en el bosque semideciduo y bosque de ciénaga temporalmente inundados en la región de Pálpite, Ciénaga de Zapata, Cuba, durante los años de 1998 al 2002, y los meses de enero-mayo, julio, septiembre y octubre. En total, 99 especies de aves han sido registradas en la área, incluyendo seis globalmente amenazadas o casi-amenazadas, y 15 endémicos, una proporción bastante alta de especies. La abundancia relativa en todas estaciones se presenta para todas las especies, con notas sobre la nidifación, estructura de la vegetación, alimentación y hábitat. Adicionalmente, el Potú *Nyctibius jamaicensis* ha sido registrado en la área, el cual se registró recientemente para Cuba y conocido en pocas localidades. Notas sobre las poblaciones de especies amenazadas en la área son presentadas, con otros interesantes registros.

Palabras clave: avifauna, Catharus fuscescens, Ciénaga de Zapata, Cuba, endémico, especies amenazada, Geotrygon caniceps

Abstract.—We present the results of fieldwork in the semi-deciduous and seasonally inundated woodland around Pálpite, in the Ciénaga de Zapata, Cuba, from 1998 to 2002, in January–May, July, September, and October. In total, 99 bird species occur in the area, including six considered globally threatened or near threatened, and 15 that are Cuban endemics, a remarkably high proportion of the overall total. Relative and seasonal abundance is presented for all species, along with notes concerning habitat use, foraging strata and breeding. Additionally, Northern Potoo *Nyctibius jamaicensis* has been recorded in the area, a species only recently found in Cuba and still known from few localities in the island. Notes concerning the populations of threatened species in the area are also presented, along with other interesting records.

Key words: avifauna, Catharus fuscescens, Ciénaga de Zapata, Cuba, endemics, Geotrygon caniceps, threatened species

INTRODUCTION

THE LAST TWO DECADES have witnessed the publication of basic avifaunal lists for diverse areas of Cuba (e.g., Hernández Suárez *et al.* 1999; Kirkconnell 1998; Kirkconnell *et al.* 1993; Navarro *et al.* 1997; Peña *et al.* 2000a,b) but, thus far, few such have been presented for any part of the ornithologically rich Zapata Peninsula (only González Alonso *et al.* 1992, 1993). A complete list of those species known from the Ciénaga de Zapata was presented at a recent conference of the SCO (Bacallao Mesa *et al.* 1999), however, and an earlier and less complete list of birds and other terrestrial vertebrates was published by Garrido (1980). Such inventories provide important material for environmental planners and decision-makers, as they represent an invaluable first step in the prioritization and targeting of conservation resources. As part of a broader project to identify the key sites for birders visiting the Zapata region, we prepared avifaunal lists for 19 such areas (Kirkconnell *et al.* in prep.), one of which, the woodland immediately to the west of the village of Pálpite, was surveyed regularly in several months, and is the subject of this paper.

STUDY AREA

Pálpite lies approximately 5 km north of Playa Larga, which is at the head of the Bahía de Cochinos (Bay of Pigs). The principal area of semideciduous forest in the vicinity of the settlement, and that investigated by us, lies immediately to the west and south, and is included within the Ciénaga de Zapata Biosphere Reserve, but not in the Ciénaga de Zapata National Park. Typical tree species of this forest, which grows on thin soils with a limestone substrate, include Cedrela odorata, Bursera simaruba, Cordia gerascanthus, Spondias mombin, and Oxandra lanceolata (see Garrido and Kirkconnell 2000). Canopy height is typically 7-10 m. Ground cover is comparatively sparse. Mean dbh of canopyheight trees was calculated as 66.1 cm from 30 randomly selected trees within 2 m of the main trail. These woodlands become partially inundated seasonally, principally in June-October. Basic climatic data for the Zapata region were presented by Alfonso et al. (1985): mean daily temperatures range from 20°C in January to 27°C in July. The nature of the study area was fundamentally impacted by Hurricane Michelle in early November 2001, with many small areas being partially cleared as a result of tall trees being felled in its wake, and other, much larger, areas of up to several hectares or more now solely containing dead trees. In addition, the woodland is subject to small-scale human impacts, with subsistence hunting and tree harvesting, principally for house construction, occurring locally. Indeed, the destruction of much of Pálpite as a result of the same hurricane, placed additional, short-term pressure on these forests.

METHODS

We performed transects along the first 2.5 km of a human trail that runs south from Pálpite towards Playa Larga. These surveys were undertaken on a

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total of 28 days from September to May (the majority in January to April) in the years 1998-2002, with more detailed fieldwork being undertaken from 17 to 26 July 2000 and 12 to 26 July 2002. Surveys were usually conducted in the first or last three hours of daylight, on days without rain or strong winds, to coincide with the peaks in bird activity, although were occasionally performed at other less ideal times of day, and were designed only to gain an impression of those bird species present and their general level of abundance, using broad indices suggested by Parker et al. (1996), not to establish specific estimates of density. At other times of day we censused adjacent areas, around the village, principally areas of second growth and gardens. In total, 52 days of fieldwork were undertaken. All contacts with a bird species were registered, both aural and visual (the two senior authors are thoroughly familiar with the vocal characteristics of virtually all species recorded in Cuba), and we occasionally made voucher tape recordings. For this purpose, Kirwan used a Marantz PMD-201 recorder and Sennheiser ME-66 microphone, and Kirkconnell a Sony TCM-5000 recorder and Sennheiser ME-66 microphone. Several recordings by Kirwan have been archived at the National Sound Archive, London (UK). In addition, we noted any direct evidence of breeding activity (e.g., observations of food-carrying, nest attendance, adults feeding dependent young).

RESULTS

Ninety-five species, of which 15 are Cuban endemics, have been recorded in the study area. With the exception of one, Northern Potoo Nyctibius jamaicenis, all were recorded during the course of our surveys. Nyctibius jamaicensis was only recently discovered in Cuba, and has thus far been recorded from five localities, including Pálpite (Martinez et al. 2000, Kirwan 2001). It is worth noting that we have specifically searched for this species at the study site, most recently in July 2000, using tape playback, but without success. In addition, we recorded six species of global conservation concern (BirdLife International)-Gundlach's Hawk Accipiter gundlachi (Endangered), Gray-headed Quail-Dove Geotrygon caniceps (Vulnerable), Blueheaded Quail-Dove Starnoenas cyanocephala (Endangered), Cuban Parrot Amazona leucocephala (Near Threatened), Cuban Parakeet Aratinga euops (Vulnerable), and Bee Hummingbird Mellisuga helenae (Near Threatened). Given the recent proposal that nominate G. caniceps (in Cuba) and the form leucometopius (from Hispaniola) be treated specifically (Garrido et al. 2002), all five of these

Table 1. Seasonal abundance, habitat foraging height and threat status of all bird species recorded at Pálpite, Ciénaga de Zapata, Matanzas province, Cuba. Those species
highlighted in bold text are Cuban endemics (see note in the main text concerning Grey-headed Quail-Dove Geotrygon caniceps and Cuban Martin Progne cryptoleuca).
Codes defining seasonal abundance are taken from Parker <i>et al.</i> (1996): $U = uncommon (1-4 pairs per km^2)$, $R = rare (less than one bird/km^2)$, $C = >15 birds/km^2$. In the
Habitat column, 'Other' refers to areas immediately around the village, including gardens and scrub therein, and a small pool just to the east of the settlement. In the breeding
evidence column, all species for which we have observations indicating nesting in the study area are denoted 'B'. Threat status is taken from BirdLife International (2000).

Species	Scientific name	Habitat	Strata	Dec–Feb	Mar–May	Jun–Jul	Aug–Nov	Breeding	Threat status
Great Blue Heron	Ardea herodias	Other					R		· · · · · · · · · · · · · · · · · · ·
Cattle Egret	Bubulcus ibis	Other			R	R			
Green Heron	Butorides virescens	Forest	Low			R			
Black-crowned Night-Heron	Nycticorax nycticorax	Other							
Wood Stork	Mycteria americana	Other		R			R		
Turkey Vulture	Cathartes aura	Edge/Other		С	С	С	С		
Gundlach's Hawk	Accipiter gundlachi	Forest	Canopy	R	R	R			Endangered
Broad-winged Hawk	Buteo platypterus	Other			R				C C
Red-tailed Hawk	Buteo jamaicensis	Other			R	R			
American Kestrel	Falco sparverius	Edge/Other		U	U	U	U	В	
Spotted Rail	Pardirallus maculatus	Other					R		
Limpkin	Aramus guarauna	Other					R		
Killdeer	Charadrius vociferus	Other			U			В	
Black-necked Stilt	Himantopus mexicanus	Other			R			В	
Lesser Yellowlegs	Tringa flavipes	Other			R				
Solitary Sandpiper	Tringa solitaria	Other			R				
White-crowned Pigeon	Columba leucocephala	Forest	Canopy	С	С	С	С		
White-winged Dove	Zenaida asiatica	Edge		U	U	U	U		
Zenaida Dove	Zenaida aurita	Forest	All	U	U	U	U		
Mourning Dove	Zenaida macroura	Edge		U	U	U	U		
Common Ground-Dove	Columbina passerina	Edge		С	С	С	С		
Key West Quail-Dove	Geotrygon chrysia	Forest	Low	U	U	U	U		
Gray-headed Quail-Dove	Geotrygon caniceps	Forest	Low	U	U	U	U		Vulnerable
Ruddy Quail-Dove	Geotrygon montana	Forest	Low	U	U	U	U		
Blue-headed Quail-Dove	Starnoenas cyanocephala	Forest	Low	U	U	U	U		Endangered
Cuban Parakeet	Aratinga euops	Edge				R			Vulnerable
Rose-throated Parrot	Amazona leucocephala	Forest/Edge	Canopy	U	U	U	U	В	Near Threatened
Yellow-billed Cuckoo	Coccyzus americanus	Forest	Mid						
Great Lizard-Cuckoo	Saurothera merlini	Forest	Low/Mid	С	С	С	С		
Smooth-billed Ani	Crotophaga ani	Other		С	С	С	С		
Cuban Pygmy-Owl	Glaucidium siju	Forest	Mid/Cano	py U	U	U			
Stygian Owl	Asio stygius	Edge				R	R		
Short-eared Owl	Asio flammeus	Edge					R		
Northern Potoo	Nyctibius jamaicensis	Forest	Mid/Canoj	ру					see Martínez <i>et</i> <i>al</i> . (2000)

Species	Scientific name	Habitat	Strata	Dec–Feb	Mar–May	Jun–Jul	Aug–Nov	Breeding	Threat status
Common Nighthawk	Chordeiles minor	Edge					R		
Antillean Nighthawk	Chordeiles gundlachii	Edge			С	С			
Cuban Nightjar	Caprimulgus cubanensis	Forest/Edge	Low	U	U				
Cuban Emerald	Chlorostilbon ricordii	Forest	Low/Mid	С	С	С	С		
Bee Hummingbird	Mellisuga helenae	Forest	All	С	С	С	С		Near Threatened
Cuban Trogon	Priotelus temnurus	Forest	Mid/Canop	y C	С	С	С		
Cuban Tody	Todus multicolor	Forest	Low/Mid	C	С	С	С		
Antillean Palm-Swift	Tachornis pheonicobia	Other			R	R			
Belted Kingfisher	Ceryle alcyon	Other				R			
West Indian Woodpecker	Melanerpes superciliaris	Forest/Edge	Mid	С	С	С	С	В	
Yellow-bellied Sapsucker	Sphyrapicus varius	Forest	Mid	С	U				
Cuban Green Woodpecker	Xiphidiopicus percussus	Forest	Mid/Canop	y C	С	С	С	В	
Northern Flicker	Colaptes auratus	Forest	Mid/Canop			Ū			
Crescent-eyed Pewee	Contopus caribaeus	Forest	Low/Mid	C	С	С	С	В	
La Sagra's Flycatcher	Myiarchus sagrae	Forest	All	C	C	C	C		
Eastern Kingbird	Tyrannus tyrannus	Forest/Edge	All				R		
Gray Kingbird	Tyrannus dominicensis	Forest	Canopy		U	U		В	
Loggerhead Kingbird	Tyrannus caudifasciatus	Forest	Low/Mid	С	Č	Č		B	
White-eyed Vireo	Vireo griseus	Forest	Mid	•	-	-	R		
Cuban Vireo	Vireo gundlachii	Forest	Low/Mid	С	С	С	C	В	
Yellow-throated Vireo	Vireo flavifrons	Forest	Mid	e	C	e	R	2	
Red-eyed Vireo	Vireo olivaceus	Forest	Mid						
Black-whiskered Vireo	Vireo altiloquus	Forest	Mid/Canop	v	С	С		В	
Cuban Crow	Corvus nasicus	Other	inital currep	U	Ŭ	Ŭ		2	
Cuban Martin	Progne cryptoleuca	Other		0	C	Ř			
Free Swallow	Tachycineta bicolor	Other		R		it.			
Northern Rough-winged Swallow	Stelgidopteryx serripennis	Other				R			
Cave Swallow	Petrochelidon fulva	Other			R				
Blue-gray Gnatcatcher	Polioptila caerulea	Forest	Mid	С	C		С		
Veery	Catharus fuscescens	Forest	Low	R	C		C C		
Red-legged Thrush	Turdus plumbeus	Forest	Low/Mid	C	С	С	С	В	
Gray Catbird	Dumetella carolinesis	Forest	Low/Mid	Č	Č	e	C C	2	
Northern Mockingbird	Mimus polyglottos	Edge	Lowning	č	č	С	С		
Blue-winged Warbler	Vermivora pinus	Forest	All	R	÷	~	C		
Northern Parula	Parula americana	Forest	All	C	U		U		
Magnolia Warbler	Dendroica magnolia	Forest	All	C	U		U		
Black-throated Blue Warbler	Dendroica caerulescens	Forest	Low/Mid	č	C		C		
Black-throated Green Warbler	Dendroica virens	Forest	All	U	U		U		
Yellow-throated Warbler	Dendroica dominica	Forest	Mid/Canop		U		0		

Species	Scientific name	Habitat	Strata	Dec-Feb	Mar–May	Jun–Jul	Aug–Nov	Breeding	Threat statu
Prairie Warbler	Dendroica discolor	Forest	Low/Mid	U	U		U		
Palm Warbler	Dendroica palmarum	Forest/Edge	Low/Mid	U	U		U		
Black-and-white Warbler	Mniotilta varia	Forest	Low/Mid	Ċ	C	R	C		
American Redstart	Setophaga ruticilla	Forest	All	С	C		C		
Worm-eating Warbler	Helmitheros vermivorus	Forest	Low/Mid	U	-		U		
Ovenbird	Seiurus aurocapillus	Forest	Low	Ū	U		Ū		
Northern Waterthrush	Seiurus noveboracensis	Forest	Low	Ū	_		-		
Louisiana Waterthrush	Seiurus motacilla	Forest	Low			R			
Common Yellowthroat	<i>Geothlypis trichas</i>	Edge		С	С				
Yellow-headed Warbler	Teretistris fernandinae	Forest	Low/Mid	С	C	С	С	В	
Hooded Warbler	Wilsonia citrina	Forest	Low/Mid	R	-	-	R	_	
Bananaquit	Coereba flaveola	Edge			R				
Red-legged Honeycreeper	Cyanerpes cyaneus	Forest	Mid/Canor	ov R		R			
Western Spindalis	Spindalis zena	Forest	Mid/Canor	5	U	U		В	
Summer Tanager	Piranga rubra	Forest	Mid	5		R			
Scarlet Tanager	Piranga olivacea	Forest	Mid		R				
Cuban Bullfinch	Melopyrrha nigra	Forest	Low/Mid	С	С	С	С		
Yellow-faced Grassquit	Tiaris olivacea	Forest	All	C	C	Ċ	C	В	
Rose-breasted Grosbeak	Pheucticus ludovicianus	Forest	All				R		
Tawny-shouldered Blackbird	Agelaius humeralis	Other		С	С	С	С		
Cuban Blackbird	Dives atroviolacea	Other		Ċ	Č	Č	Č		
Greater Antillean Grackle	<i>Quiscalus niger</i>	Other		Č	Č	Č	Č		
Shiny Cowbird	Molothrus bonariensis	Other		Č	Č	Č	Č		
Greater Antillean Oriole	Icterus dominicensis	Forest	Low/Mid	С	C	C	C	В	
Baltimore Oriole	Icterus galbula	Forest	Low/Mid	-	-	-	-		
House Sparrow	Passer domesticus	Other		С	С	С	С	В	

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may be considered endemic. Among the 19 sites reviewed by Kirkconnell *et al.* (in prep.), just six support more endemic species than Pálpite and yet, in contrast, only seven areas hold a lower total number of species, demonstrating the relatively high proportion (16%) of endemics within the avifauna of the study area. (Note that for our present purposes, and our work in progress, we consider Cuban Nightjar *Caprimulgus cubanensis* as an endemic species (following Garrido and Reynard 1998) and Cuban Martin *Progne cryptoleuca* an endemic breeder, whose wintering grounds are subject entirely to speculation. Otherwise, our taxonomy and nomenclature follows American Ornithologists' Union 1998.)

In Table 1, we present the relative abundance of all species recorded in the area, according to the two main seasons. Those species for which specific evidence of breeding in the area is available are denoted, and notes on the habitats used around Pálpite and principal foraging strata for those species recorded in forest are also presented.

SPECIES ACCOUNTS

Gundlach's Hawk *Accipiter gundlachi.*—Only rarely recorded in the study area: one in typical low dashing flight on 15 February 1999, one on 26 July 2000, one in soaring flight on 24 April 2002, a pair alarm-calling on 17 July 2002, and a recent kill which was presumed to belong to this species (given that it clearly was that of an *Accipiter*) on 21 July 2002.

Spotted Rail *Pardirallus maculatus*.—One was found dead in the town on 9 September 2002; it had probably hit an overhead electric wire at night.

Gray-headed Quail-Dove Geotrygon caniceps.-Reasonably common, being recorded on most transects and in the wet season (May to October) appears to be the commonest quail-dove at the study site. We have no definite evidence of breeding at this locality but cannot conceive that it does not do so, and perhaps in some numbers. We have records from 10 localities in the Zapata region (one of which was largely destroyed by Hurricane Michelle), which is clearly one of the species' major strongholds, and acquires even greater importance if one considers G. c. caniceps at the specific level (Garrido et al. 2002; Kirkconnell et al., in prep.). It is important, therefore, that areas such as the woodlands surrounding Pálpite, as part of the Biosphere Reserve, are adequately protected.

In addition, we take the opportunity here to com-

ment further on apparent differences between nominate caniceps and leucometopius of the Dominican Republic. In an earlier contribution to this issue, Garrido et al. (2002) remarked on the lack of specific vocalization data to compare the two forms in this respect. In particular, the lack of recordings from Hispaniola thwarts effective analysis of any differences, but it is worth noting the overlooked remarks of Wetmore and Swales (1932) that leucometopius changes from its fast song to the slow song. Neither Garrido or Kirwan have experience of this form's ability to change from one song-type to another (Kirwan having heard only the fast song), but both observers, and Kirkconnell, have vast experience with nominate *caniceps*, which we have only witnessed to change from the slow to the fast song. Whether this potential difference in the vocalizations of the two forms is real must be the subject of future research.

Blue-headed Quail-Dove *Starnoenas cyanocephala.*—At Pálpite, this species appears to be the rarest of the four quail-doves. Whereas all are treated as Uncommon in Table 1, according to the criteria for assessing general status employed here, the number of encounters with this species during our fieldwork suggests that *Starnoenas* is rarer than the three *Geotrygon* in the area.

Cuban Parakeet Aratinga euops.—Few records in the study area, and perhaps almost certainly largely absent in the dry season (November to April). Most regularly recorded in July 2002 when three were observed on 16th, four on 18th, one on 19th, and four on 21st. These records may suggest local movements in response to local changes in food supplies following Hurricane Michelle, localized habitat changes caused by the same climatic event, or more probably that the species exhibits seasonal foraging patterns (though the species was not recorded in July 2000, when equal-effort fieldwork was conducted in the study area), for which limited evidence is available from the mountains around Trinidad (Collar 1997; Kirkconnell, pers. obs.).

Bee Hummingbird *Mellisuga helenae.*— Recorded regularly throughout the study period, with up to six recorded per day. Singing males were most frequently encountered in April to July. According to our research, Pálpite appears to be one of the species' strongholds in the Zapata region, which, in turn, is perhaps the most important area on the island for this Near-Threatened species.

Common Nighthawk *Chordeiles minor.*— Garrido and Kirkconnell (2000) consider it to be an uncommon transient through Cuba, making the observation of 40 on 9 September 2002 somewhat unusual.

Eastern Kingbird *Tyrannus tyrannus.*— Considered a rare transient in Cuba (Garrido and Kirkconnell 2000) making the observation of c. 100 on active migration on 9 September 2002 exceptional.

Veerv Catharus fuscescens.-One on 26 February 2001 is the first February record in Cuba and the West Indies of a scarce transient through the region (Raffaele et al. 1998, Garrido and Kirkconnell 2000). Remsen (2001) re-evaluated the winter range of this species. For his purposes, he defined winter as being from 2 December to 20 February; all records from this period were from three small areas at the periphery or south of the Amazon basin, in South America. He located no records from the West Indies, Mexico, and Belize from November to March, or from elsewhere in Central America from December to February. Given Remsen's findings, it seems unlikely that the Pálpite record was anything other than an exceptionally early migrant (a hypothesis we favor). However, the possibility exists that tiny numbers could perhaps winter somewhere/ occasionally in the Caribbean region, a supposition perhaps confirmed by the presence of one with a damaged leg, which was photographed, at Soroa, Pinar del Río province, on 1 January 2003 (P. Morris, in litt. 2003). That this latter individual had a damaged leg does mean that it may have been forced to winter in the West Indies. However, the date of the record does suggest that it was either able to do so, despite its injury, or that it had already 'elected' to winter in the Caribbean and only incurred the damaged leg subsequently.

Black-and-white Warbler *Mniotilta varia.*—A female present within a flock of Black-whiskered Vireos *Vireo altiloquus*, Yellow-headed Warblers *Teretistris fernandinae* and Cuban Bullfinches *Melopyrrha nigra*, on 20–22 July 2002 at least, is the earliest fall report for Cuba (Garrido and Kirk-connell 2000).

Bananaquit *Coereba flaveola.*—One in a garden in the village on 23 July 2000 is the first record from the well-watched Zapata region, and one of only four localities in mainland Cuba where the species, which is mysteriously scarce in the country, has been found (Wallace *et al.* 1999, Mazar Barnett and Kirwan 2001).

Scarlet Tanager Piranga olivacea.—A male on

4 May 2002 is the latest spring report in Cuba of this rare transient, which is more frequently noted in the fall (Garrido and Kirkconnell 2000), and probably one of the few West Indian records in this month (Raffaele *et al.* 1998).

Records of the following species are also of interest, they being uncommon in Cuba: Blue-winged Warbler *Vermivora pinus* (male on 15 February 1999), and Summer Tanager *Piranga rubra* (female/immature on 29 October 1999).

DISCUSSION

Cuba and its related cays was considered an Endemic Bird Area (Stattersfield et al. 1998), which harbors 25 endemic species (a total which did not include Geotrygon caniceps and several other taxa that will probably be considered as species in forthcoming taxonomic revisions). Ten species that are treated as range-restricted (i.e., their historical ranges are judged to occupy less than 50,000 km²) are known from Cuba (Stattersfield et al. 1998) but only one of these, Yellow-headed Warbler Teretistris fernandinae, has been recorded in our study area. However, of the 23 globally Threatened or Near-Threatened species known from Cuba (BirdLife International 2000), six have been recorded at Pálpite. Just five of the 19 sites in the Zapata region identified by Kirkconnell et al. (in prep.) hold more threatened or near-threatened birds (all harbor seven). Thus, given the occurrence of so many species of conservation concern and endemic to Cuba within this small area, the conservation of the seasonally dry deciduous forests around Pálpite should be considered a priority within the overall protection of biodiversity in the Zapata region. Despite the entire Zapata Peninsula having been designated a protected area (Scott and Carbonell 1986), considerable threats still face many bird species in the area; those threatening some of the hole-nesters were succinctly illustrated by Mitchell et al. (2000). An environmental education project is currently underway in the region (Lowen 2002), which should provide a much-needed boost to conservation efforts in Zapata. Visiting birdwatchers are urged to ensure that landowners, hotel owners, and local people are made aware of their interest in birds and natural history, and their reason for visiting the area. Only through such actions will the local population be made more clearly aware of the exceptional importance of the Zapata region to wildlife, and the need to protect the area.

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