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LETTERS

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UNUSUAL CONCENTRATION OF BLACK-CHESTED BUZZARD-EAGLES IN CENTRAL ARGENTINA

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In birds, gregariousness has been traditionally explained as a way to enhance individual survival (Beauchamp 2010), although bird aggregations can also be the result of reproductive or social behavior (Wiley et al. 1991, Blanco and Tella 1999). Raptors are usually territorial species that forage alone or in pairs and thus, except in the case of family groups at the end of the breeding season, it is rare to observe more than one or two individuals together (del Hoyo et al. 1994). However, there are some remarkable exceptions. Several vulture species usually forage and roost in groups. Some vultures, kites, falcons, and Ospreys (*Pandion haliaetus*) also breed colonially or semicolonially (del Hoyo et al. 1994). In addition, some species that are solitary breeders can form large flocks during migration (Bildstein 2006) or aggregate in large numbers around predictable food sources or communal roosts, especially during the winter (e.g. Watts and Mojica 2012) but also, in some cases, during the breeding season (e.g., Donázar et al. 1996).

The Black-chested Buzzard-Eagle (*Geranoaetus melanoleucus*) is a large buteonine eagle, widely distributed in South America, from Venezuela to southern Argentina and Chile, where it occupies open areas from sea level to over 4500 masl (Ferguson-Lees and Christie 2005). The eagle's body size, coloration, and habit of foraging over slopes and hilltops make this raptor a conspicuous species in South America, although little is known about its biology (Jiménez and Jaksic 1989).

The species is territorial, so it can be usually seen in pairs or alone (Jiménez and Jaksic 1989). There are records of about a dozen individuals gathering at food sources, specifically in garbage dumps in the province of Mendoza (Argentina) and in the surroundings of Santiago de Chile (Chile; Lobos et al. 2011, Ibarra and De Lucca 2015). In the early 1990s, Hiraldo et al. (1995) found four communal roosts of immature eagles in the area of Junín de los Andes, Province of Neuquén, in the foothills of the Andes. They found a maximum of 14 individuals per roost.

The Provincia de La Pampa, in central Argentina, is a generally flat province that rises gently from around 200 masl in the south and east to 1125 masl in the northwest. It's characterized by a temperate, dry subhumid climate (Cabrera 1976) with an average annual temperature of between 14° and 16°C. The average temperature varies between 8°C in winter (with absolute minimums of –12.7°C) and 25°C in summer (with absolute maximums of 43°C). Average annual rainfall ranges from 200 mm in the west to 750 mm in the northeast. The highest average monthly rainfall occurs in the summer (October to March), but rain is scarce in the winter, generating a significant water deficit (Casagrande and Conti 1980).

This climatic variation, along with soil attributes, broadly determines the characteristics of the three main ecoregions that run northwest–southeast, the Monte (shrub steppes) in the west-southwest, the semiarid forests of the Espinal in the center and the former Pampean grasslands, today mostly transformed to agriculture in the northeast (Cabrera 1976; Fig. 1).

The Black-chested Buzzard-Eagle is a rare breeder in the Provincia de la Pampa, occupying scattered small rocky outcrops (*bardas*) in the Atuel River in the west of the province (M. Galmes pers. comm.), in the southwest and in the "sierras" of Lihuel Calel National Park (small hills that rise about 200 m above the surroundings) in the center of the province (F. Bruno pers. comm.). Although it is not an abundant species, in winter some isolated birds or small groups can be found throughout the province, in both natural and agricultural lands. Individuals have even been observed flying over urban areas such as Santa Rosa, the capital city of La Pampa (J. Grande unpubl. data). During a

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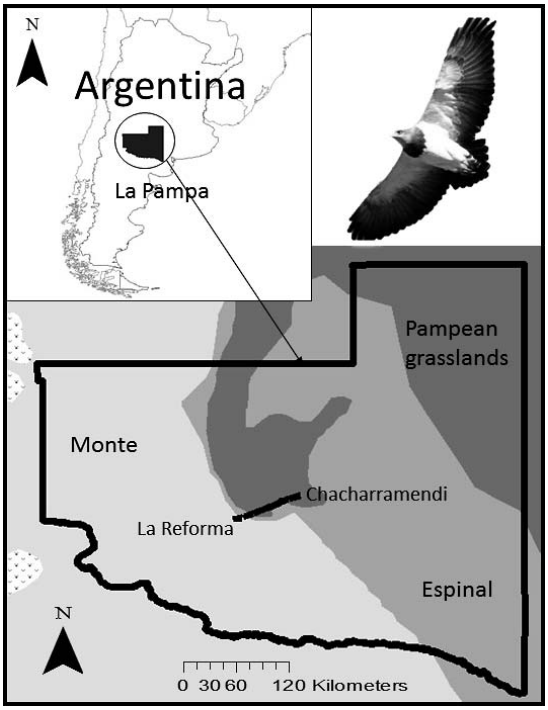

Figure 1. Road segment of Ruta Provincial 20 between Chacharramendi and La Reforma, La Pampa, Argentina, where up to 126 Black-chested Buzzard-Eagles (*Geranoaetus melanoleucus*) were observed between 14 June and 9 July 2016. The three ecoregions that cross the province are also shown.

raptor census in the province, on 14 June 2016, we observed 113 Black-chested Buzzard-Eagles in 30 km along Ruta Provincial 20 (Fig. 1), between the towns of Chacharramendi and La Reforma. Most of them were juveniles and subadults (90%). In that same section of the road, 126 eagles were seen on 3 July and 123 individuals on 9 July, of the same year. The area, located at 200 masl, has gentle hills and valleys, plateaus, and plains. It is covered with shrubs up to 2 m high, and with scattered small *caldén* trees (*Prosopis caldenia*; 3–4 m; Fig. 2A). Most eagles were perched on power poles on a medium-voltage power line and only a few were perched in trees and shrubs, or on the ground. We observed up to three eagles perched together in a single pylon (Fig. 2B). Pylons from electric power lines can be dangerous for raptors, as in fact are the pylons used by eagles in this study (J. Sarasola pers. comm.). However, they often attract raptors, as they are high perching sites on which raptors can hunt, feed, or rest. The raptors can also shade or expose themselves to the sun (Ferrer and Janss 1999). The poles' use as perching sites is more prevalent in habitats with low vegetation, such as our study area, where other good perches are scarce or nonexistent. In particular,

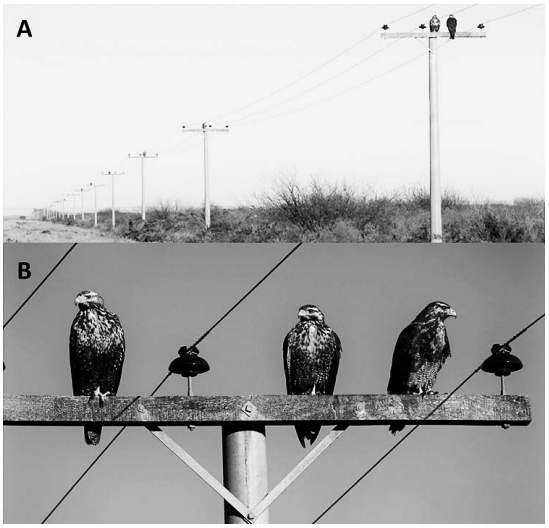

Figure 2. (A) Ten Black-chested Buzzard-Eagles can be distinguished on eight power pylons between Chacharramendi and La Reforma, La Pampa, Argentina. Note the difference in vegetation cover on the two sides of the fence, shrubby vegetation on the ranches to the right of the fence and low, mowed pastures on the road shoulder to the left. (B) Three immature 2–3-yr-old eagles on a single pylon, 14 July 2016.

the power line where eagles were perched in this study was located at the border between ranches covered with shrubby vegetation and a wide extended road shoulder (approximately 50 m on each side of the road) covered with low pasture-like vegetation, ideal for hunting eagles (Fig. 2B).

Although solid data are scarce, some authors suggest that Black-chested Buzzard-Eagles might make migratory or, at least, dispersive movements from the southern part of their range or from the highest and most remote areas of the Andes Mountains to lower elevations with milder winters and high food availability (Capurro and Bucher 1988, Blendinger et al. 2004, Ferguson-Lees and Christie 2005). The unusual concentration of Black-chested Buzzard-Eagles in an area without a significant breeding population suggests there may indeed be some mobility of the species, especially of immature and nonbreeding birds.

Previous records of aggregations of individuals of this species were believed to be related to high and predictable food resources such as garbage dumps (Lobos et al. 2011, Ibarra and De Lucca 2015) or to social roosting aggregations (Hiraldo et al. 1995). We have previously recorded some Black-chested Buzzard-Eagle aggregations in other areas of the country (18 eagles in 13.5 km near Villa Mercedes, San Luis, on 21 June 2012; 15 eagles near Dean Funes, Córdoba, on 8 July 2012; and seven eagles in 10 km

in the west of Santiago del Estero on 30 April 2016). In the first and third localities, large concentrations of Eared Doves (*Zenaida auriculata*), a good prey for the eagles, were observed, but in Dean Funes no obvious food sources were detected. All these concentrations occurred during the austral autumn or winter.

The concentration of individuals reported here is by far the largest recorded for the species and was likely linked to a population explosion of common yellow-toothed cavies (*Galea musteloides*) after an unusually rainy year linked to "El Niño" phenomenon. Although there are no published data, some local ranchers have indicated that large cavy and eagle concentrations do not occur every year, but they do occur periodically, suggesting there may be cycles of rodent abundance, as have been described in other systems (e.g., Korpimäki and Krebs 1996). Undoubtedly, the exceptionally intense precipitation of 2016 at La Pampa, a quite arid environment, is not common but it may occur with periodicity. More research is needed to determine if these rodent cycles exist in the semiarid ecosystems of central Argentina. Further research is also needed to determine the movement patterns of Black-chested Buzzard-Eagles, especially during their early life, as well as to identify the social and environmental factors contributing to individual aggregations such as the one described here.

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