Wilson Bull., 103(3), 1991, pp. 366–372

DISTRIBUTION AND NEST SITES OF THE MONK PARAKEET IN BOLIVIA

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ABSTRACT.—A little-known, distinctive subspecies of Monk Parakeet, *Myiopsitta monachus luchsi,* was observed during 13 days from December 1981 to March 1982 in the arid intermontane valleys in south central Bolivia. Twenty-seven flocks (2 to 22 parakeets per flock) were observed at elevations between 1300 and 3000 m. Seventeen active stick nests were located on cliffs. No nests were found in trees, where the other subspecies always build their nests. A museum search and literature review produced 35 specimens of this subspecies, 32 with specific localities. The known range includes the departments of Chuquisaca, Cochabamba, La Paz, and Santa Cruz. *Received 10 Dec. 1990, accepted 3 April 1991.*

The Monk Parakeet (*Myiopsitta monachus*) is a familiar and generally common bird throughout much of its large range in southern South America (Ridgely 1981, Forshaw 1989). As summarized by Forshaw (1989), the species is primarily a lowland bird, rarely occurring above 1000 m elevation, and is found in low rainfall areas in open forest, trees along watercourses, savannah woodland, dry *Acacia* scrubland, palm groves, farmlands, and orchards. The parakeet is particularly common in the vicinity of human habitation. The nest, unique among parrots, is a bulky structure built from dry twigs placed in the topmost branches of a tree, which contains one or more nest chambers and is occupied throughout the year by one or more pairs (Forshaw 1989).

One subspecies, however, is not common or widespread. *M. m. luchsi* is little-known, seldom recorded, and apparently rare and very local (Ridgely 1981, Forshaw 1989). *M. m. luchsi* is the most distinctive of the four recognized subspecies, with the forehead and fore crown uniformly pale grey and not brownish, the breast uniformly pale grey without barring, the band across upper abdomen purer yellow and less olive, and the outer webs of the primaries pale blue without green margins (Salvadori 1891, Short 1975, Forshaw 1989; including color plate on p. 509). The following notes, by Carriker (in Bond and Meyer de Schauensee 1943:191), are the only published observations of *M. m. luchsi*: "Several flocks of these birds were seen at Ele-Ele . . . moving up in the valley. They are not particularly shy. They were always seen along the river in heavy vegetation." Carriker collected five males and five females at Ele Ele (1450 m elevation, Fig. 1) during 8–17 October 1937 (Bond and Meyer de Schauensee 1942, 1943). There is abundant xerophytic vegetation at Ele Ele, with thorny

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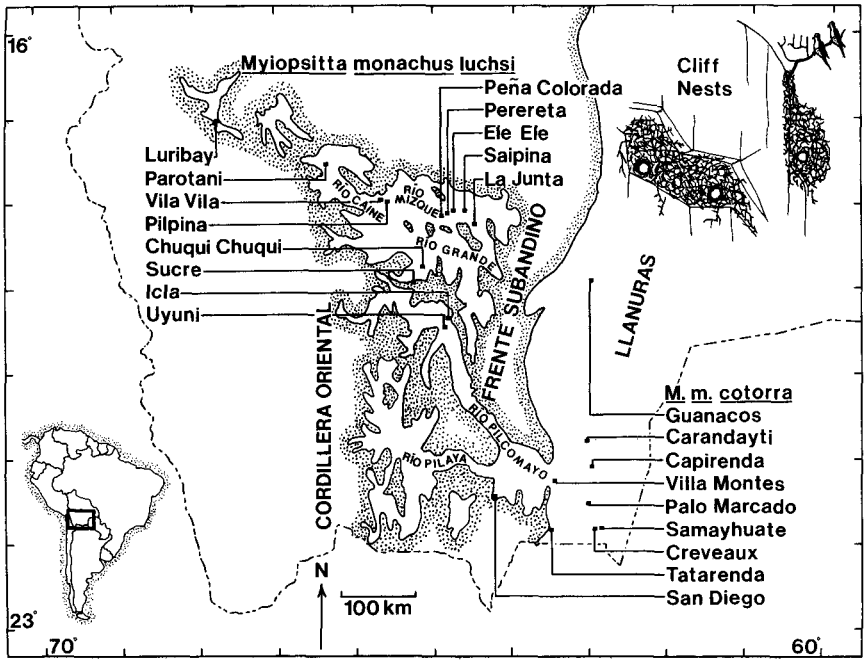

FIG. 1. Map of southern Bolivia with the localities for the Monk Parakeet *Myiopsitta monachus luchsi*) in the arid intermontane valleys and nearby localities for *M. m. cotorra.* The cliff nests are representative of those built by *M. m. luchsi.*

scrub and a tremendous variety of cacti, some 12 m tall (Bond and Meyer de Schauensee 1942).

Ridgely (1981) surveyed the status of parrots in ecologically similar areas east of Ele Ele in March and April 1977 and October 1979 and was unable to find *M. m. luchsi.* I searched for *M. m. luchsi* between late December 1981 and early March 1982 while studying the Red-fronted Macaw (*Ara rubrogenys*) in south central Bolivia.

STUDY AREA AND METHODS

The study was conducted in the arid intermontane valleys along the eastern slope of the Andes in south central Bolivia (Fig. 1). The study area has been described in Lanning (1991).

I searched for *M. m. luchsi* during six weeks between late December 1981 and early March 1982 while hiking 340 km up and down the valleys and canyons of the eastern Andes. I observed the parakeets and their nests on an opportunistic basis, while studying the Red-fronted Macaw (Lanning 1991). All measurements of the parakeet's stick nests and cliffs are visual estimates. I did not carry technical climbing equipment and, therefore, was not able to examine nest chambers. I corresponded with biologists and curators from 1985 to 1989 for information on *M. m. luchsi* and *M. m. cotorra* in southern Bolivia.

RESULTS

Distribution and activities.—I observed 27 flocks of Monk Parakeets (all *M. m. luchsi*) during 13 days between 20 December 1981 and 1 March 1982 in the departments (dptos.) of Cochabamba, Santa Cruz, and Chuquisaca. Eighteen flocks (104 parakeets) were sighted along the drainage of the Río Mizque between Peña Colorado and Ele Ele and between Saipina and La Junta (Fig. 1). Nine flocks (59 parakeets) were sighted in the Río Pilcomayo drainage from near Icla to Uyuni (Fig. 1). The flock size ranged from two to 22 birds ($\bar{x}$ = 6.4 ± 4.6 [SD]). All individuals were in the arid intermontane valleys at elevations between 1300 and 3000 m. The parakeets were locally distributed; I did not find them in many areas of apparently suitable terrain and vegetation.

Monk Parakeets were active throughout the day. When first sighted, 13 flocks were flying, five flocks were in the vicinity of their nests, four flocks were perched on large caraparí columnar cacti (*Neocardenasia herzogiana*), two flocks were perched in *Acacia* sp. shrubs, and three flocks were perched in unidentified trees. The Monk Parakeets ate the small oval fruits on the top of the caraparí cacti and the seed pods of *Acacia furcatispina* (acacia identified by D. Wasshausen, pers. comm.).

Nest sites.—I located 16 Monk Parakeet stick nests on four sheer cliffs (at 1300 to 1800 m) along the Río Mizque drainage and one Monk Parakeet stick nest on a sheer cliff (at 2200 m) along the Río Pilcomayo drainage. Monk Parakeets were active at all cliffs with nests. Parakeets regularly were entering and leaving chambers in the nests, but I was not able to determine the stage of nesting at any of the nests.

The 17 stick nests contained between one and six chamber entrances ($\bar{x}$ = 2.5 ± 1.8). The smallest nest was 0.5 m long and 0.5 m diameter. The largest nest was 5 m tall and 1 m diameter. The volume of the stick nests varied from 0.1 to 5.0 m^3 ($\bar{x}$ = 0.9 ± 1.5). The nests were constructed with interwoven twigs, mostly with thorns. The twigs were usually 20 to 40 cm long. Fifteen nests were anchored to the face of the cliff by twigs wedged in crevices in the rock (Fig. 1). Two nests (1.5 m long and 0.5 m diameter) were hanging over the top edge of a smooth cliff (without crevices), each nest attached with twigs woven around the base of a small shrub growing at the cliff edge (Fig. 1).

The largest cliff, containing three nests, was 50 m tall and 600 m long. There were two nests at a cliff 40 m tall and 100 m long, six nests at a cliff 15 m tall and 75 m long, five nests at a cliff 15 m tall and 40 m long, and one nest at a cliff 10 m tall and 10 m long. All nests were at least 5 m above the base of the cliff, and all but one were on the upper half of the cliffs. The nests were on cliffs that faced west, north, and east. The cliffs were present both near the rivers and on the upper slopes.

Museum specimens.—A museum search and literature review produced

35 specimens of *M. m. luchsi.* (See "Acknowledgments" for museum abbreviations.) The earliest specimen (MNHN; M. d'Orbigny 195), collected in 1829 and examined by Souancé, has "Uruguay, Banda orientale" listed as the locality on the label. Voisin (pers. comm.) feels that Uruguay is probably an error and that "Banda orientale" may mean the oriental part of Bolivia. "Banda oriental" translates as "eastern band or edge" and may refer to the Cordillera Oriental of the Andes. Two adults (BMNH 1846.9.9.41 for both syntypes), collected by T. Bridges and purchased in 1846, have only "Bolivia" listed as their locality (Salvadori 1891).

The other 32 specimens have specific localities. One male (ZMB 87.5) was collected or purchased at Perereta (1500 m, Fig. 1) by F. Behn in April 1847. Two females (ZMB 87.6, 87.7) were collected at Luribay (2600 m, Fig. 1) by A. Stöcker in April 1913; Stöcker's label notes give the impression that these were wild birds (G. Mauersberger, pers. comm.). The Perereta and Luribay locations were mentioned without the additional distribution data in Peters (1937). Two males (BMNH 1902.3.13.1328, 1902.3.13.1329) were collected at Parotani (2500 m, Fig. 1) by P. O. Simons in April 1901. One female and one male (BMNH 1902.3.13.1326, 1902.3.13.1327) were collected at Sucre (2600 m, 2500 m; Fig. 1) by Simons in September 1901. Nine females and four males (SMNH) were collected at Vila Vila (2550 m, Fig. 1) by A. M. Olalla in January 1939. One female and one male (SMNH) were collected at Pilpina (2700 m, Fig. 1) by Olalla in January 1939. Eight of Carriker's 10 specimens from Ele Ele are at ANSP, and two were traded to the U. Mich. Mus. Zool. in 1978 (R. Ridgely, pers. comm.).

DISCUSSION

Distribution.—Bond and Meyer de Schauensee (1943) discuss the specimens from Ele Ele in Dpto. Cochabamba, and Forshaw (1989) states that the subspecies is known only from Dpto. Cochabamba.

There is a recent sighting (19 April 1987, Fjeldså 1987) of an unlisted number of *M. m. luchsi,* in *Prosopis* woodland with large columnar cacti, along a tributary of the Río Grande between Chuqui Chuqui and Sucre (1800 m, 2800 m; Fig. 1). Fjeldså told N. Krabbe (pers. comm., both on the same trip) that there were about five to 10 parakeets flying low.

Based on both observations and specimen records, *M. m. luchsi* has been found at 1300 to 3000 m in the arid intermontane valleys of south central Bolivia. The locations (from north to south) are in the dptos. of southeastern La Paz, southern Cochabamba, western Santa Cruz, and northern Chuquisaca. All records are from the thorn steppe, thorn woodland, and dry forest life zones in the arid intermontane valleys on the eastern side of the Andes.

Nest sites.—*M. m. luchsi* stick nests on cliffs appeared similar to de-

scriptions of stick nests in trees, where the other subspecies always build their nests. Monk Parakeet nests in trees vary in height from nests "easily reached from the ground" in talas (*Celtis tala*) up to nests in the tops of eucalypts (*Eucalyptus* spp.) 30 m tall (Gibson 1919). Monk Parakeet nests in trees are attached among the forking limbs or are hanging from the ends of branches (photos in Laubmann 1930, Naumburg 1930, and Conway 1965; color plate in Forshaw 1989), analogous to the positions of cliff nests attached into crevices or hanging from a small shrub at the top of the cliff. Twigs 40 cm long seemed very large for a bird only 29 cm in length (Forshaw 1989); however, Harrison (1973) found the same species to use twigs about 40–45 cm long at the London Zoo.

I found no evidence that *M. m. luchsi* constructs stick nests in trees. I did not find references to other subspecies of Monk Parakeets building their stick nests on cliffs. I do not know why *M. m. luchsi* nests only on cliffs; there were trees in the vicinity of the cliff nests and throughout the valleys that were of sufficient stature to support the parakeet's stick nests. "Cliff Parakeet" would be an appropriate English name for this bird (Ridgely, pers. comm.).

M. m. cotorra.—Four *M. monachus* specimens (CMNH) were collected at Guanacos (500 m, Fig. 1), Dpto. Santa Cruz, during August 1909 and September 1915 and seven specimens (LACM) were collected 30 km southeast of Carandayti (600 m, Fig. 1), Dpto. Chuquisaca, during July and August 1957 (Remsen et al. 1986). The 11 specimens are all *M. m. cotorra* (K. L. Garrett and K. C. Parkes, pers. comm.). Two *M. m. cotorra* specimens (LACM) were collected at Capirenda (750 m, Fig. 1), Dpto. Santa Cruz, during July 1957. Seven *M. m. cotorra* specimens were collected at Villa Montes (450 m, Fig. 1), Dpto. Tarija, during May 1926 (Laubmann 1930). Laubmann (1930) considered the parakeets infrequent at the edge of the Andes and abundant throughout the lowlands of the Gran Chaco. Eisentraut (1935) observed small flocks of *M. m. cotorra* during the dry season near Villa Montes and found the parakeets and their stick nests abundant farther down the Río Pilcomayo at Palo Marcado and Samayhuate, Dpto. Tarija (400 m, Fig. 1). Lönnberg (1903) wrote of small flocks of about eight or 10 *M. monachus* occurring at Creveaux and Tatarenda (400 m, 650 m; Fig. 1), Dpto. Tarija, from March to May 1902. Two specimens of *M. monachus* were shot at San Diego (1600 m, Fig. 1), Dpto. Tarija, in March 1902 (Lönnberg 1903). These two specimens (SMNH) are indeed *M. m. cotorra* and represent the farthest west and the highest known records for this subspecies.

M. m. luchsi and M. m. cotorra.—There are no specimens intermediate between *M. m. luchsi* and *M. m. cotorra,* despite the fact that their known ranges come within 175 km of each other. Their altitudinal ranges overlap

slightly, and both forms inhabit similar thorn woodland and dry forest life zones. Field work is needed between the known ranges of the two forms along the drainages of the Río Grande and Río Pilcomayo and along the drainage of the Río Pilaya (Fig. 1), a major tributary of the Río Pilcomayo. All of these drainages are accessible by hiking, by river travel via rafts, and by some rough roads. Few, if any, collectors and biologists have ever traversed these rugged valleys and canyons.

What remains unknown is whether Monk Parakeets occur continuously in the region between *M. m. luchsi*'s and *M. m. cotorra*'s ranges in southeastern Bolivia, or whether the apparent gap is real. It is also unknown what types of nest substrates are used in the intervening area. Answers to these questions will determine whether *M. m. luchsi* is worthy of full species status.

ACKNOWLEDGMENTS

I appreciate the encouragement and logistical support by W. King and R. Ridgely and the acacia identification by D. Wasshausen. I thank the following persons and organizations for their correspondence and museum support: G. Cowles and the British Museum (Natural History) at Tring (BMNH), J. Forshaw, G. Frisk and the Swedish Museum of Natural History in Stockholm (SMNH), K. Garrett and the Natural History Museum of Los Angeles County (LACM), N. Krabbe, J. Marshall, G. Mauersberger and the Zoologisches Museum in Berlin (ZMB), K. Parkes and the Carnegie Museum of Natural History in Pittsburgh (CMNH), J. Remsen, and R. Ridgely and the Academy of Natural Sciences of Philadelphia (ANSP), and C. Voisin and the Muséum National d'Histoire Naturelle in Paris (MNHN). I appreciate the reviews of this paper by C. Blem, J. Remsen, R. Ridgely, N. Snyder, S. Tornquist, and an anonymous reviewer. I acknowledge the financial support for the Red-fronted Macaw survey from the Pan American Section of the International Council for Bird Preservation and the New York Zoological Society. Finally, I thank Macario Brito, Angel Tapia, and the many other residents I met during the survey; this study would not have been possible without their gracious assistance and hospitality.

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