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BIRDS OF THE CENTRAL RIO PARACTI VALLEY, A HUMID MONTANE FOREST IN DEPARTAMENTO COCHABAMBA, BOLIVIA

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Resumen. – Avifauna del valle central del Río Paracti, un bosque húmedo montañoso en el Departamento de Cochabamba, Bolivia. – Basado en colectas ornitológicas realizadas en 1979 y entre los años 2000 y 2004, caracterizamos la avifauna del valle del Río Paracti, un valle húmedo en el pie de monte andino del Departamento de Cochabamba, Bolivia. Adyacente al Parque Nacional Carrasco, el valle del Río Paracti es caracterizado por bosques húmedos de Yungas que albergan un diverso ensamble de aves de pie de monte. Reportamos los registros mas sureños de la Pava maraquera (*Chamaepetes goudotii*) y del Monjilla lanceolada (*Micromonacha lanceolata*). Reportamos además el cuarto y quinto espécimen del Tiluchi de lomo amarillo (*Terenura sharpei*) para Bolivia y proporcionamos una descripción formal del plumaje adulto de la hembra. Presentamos también los primeros especimenes del Frutero de pico corto (*Chlorospingus parvirostris*) para el Departamento de Cochabamba. En adición a la lista anotada de especies, presentamos registros de nidificación del Picoplano pechifulvo (*Rhynchocyclus fulvipectus*), Mosquero negro (*Sayornis nigricans*), Atrapamoscas corona dorada (*Myiodynastes chrysocephalus*), Titira enmascarada (*Tityra semifasciata*) y la Oropendola verde (*Psarocolius atrovirens*). Estimamos que el 50 % de los fácilmente accesibles bosques a lo largo del camino que baja al Río Paracti desde la carretera principal Cochabamba–Santa Cruz fué convertido en áreas de agricultura entre 2000 y 2004. El Parque Nacional Carrasco proporciona protección para muchas especies de aves, aunque la destrucción de hábitat en la periferia de esta área protegida la está convirtiendo en una isla en medio de un conjunto de hábitats intervenidos antropicamente. Especies restringidas a rangos altitudinales limitados, tales como el Tiluchi de lomo amarillo, son vulnerables especialmente a la destrucción de su hábitat.

Abstract. – Based on ornithological collections and surveys conducted in 1979 and from 2000 to 2004, we characterized the avifauna of the humid Río Paracti valley in the Andean foothills of Departamento Cochabamba, Bolivia. Adjacent to Carrasco National Park, the Río Paracti valley is characterized by humid Yungas forest that supports a diverse assemblage of foothill species. Here we report the southernmost sight record of Sickle-winged Guan (*Chamaepetes goudotii*) and the southernmost specimen record of Lanceolated

Monklet (*Micromonacha lanceolata*). We report the fourth and fifth specimens of Yellow-rumped Antwren (*Terenura sharpei*) from Bolivia, and provide a description of the adult female plumage. We present the first specimen records of Short-billed Bush-Tanager (*Chlorospingus parvirostris*) for Cochabamba department. In addition to an annotated list of species from the Río Paracti valley, we present nesting records for the Fulvous-breasted Flatbill (*Rhynchocyclus fulvipectus*), Black Phoebe (*Sayornis nigricans),* Golden-crowned Flycatcher (*Myiodynastes chrysocephalus*), Masked Tityra (*Tityra semifasciata*) and Dusky-green Oropendola (*Psarocolius atrovirens*). We estimate that 50% of the easily accessible forest along the road that descends to the Río Paracti from the main Cochabamba– Santa Cruz highway was converted to agriculture between 2000 and 2004. Nearby Carrasco National Park affords some protection for birds, but rapid habitat destruction outside the park may soon make Carrasco an island in a sea of human-modified habitats. Species restricted to narrow elevational ranges, such as the Yellow-rumped Antwren, are especially vulnerable to such habitat destruction. *Accepted 14 March 2007*.

Key words: Birds, Río Paracti valley, *Micromonacha lanceolata, Terenura sharpei*, Cochabamba, Bolivia.

INTRODUCTION

The Yungas comprise the sub-tropical montane evergreen and semi-deciduous forests that carpet much of the eastern slope of the Andes (~500 to 3700 m elevation) from extreme southeastern Peru to northern Argentina (Stattersfield *et al.* 1998). South of the Serrania de Cochabamba in Bolivia, an Andean spur of the Cordillera Central that extends eastward from the city of Cochabamba to near Santa Cruz de la Sierra, the climate is much drier and Yungas forest is restricted to those peaks of sufficient elevation to be enveloped in clouds year round (Schulenberg & Awbrey 1998). Schulenberg & Awbrey (1998) characterized the habitats on either side of the Serrania de Cochabamba as "probably the most dramatic shift in flora and vegetation anywhere along the entire eastern slope of the Andes." The shift is due in part to large differences in mean precipitation. The southeastern tradewinds that carry moisture-laden Amazonian air to the northeast slope of the serrania do so to a much lesser extent south of the serrania because of the bend in the Andes from a northwest-southeast axis to a more north-south axis (García 1994).

The Serrania de Cochabamba represents the distributional limit for many foothill taxa (Anderson 1997). Remsen & Traylor (1989) estimated that at least 110 eastern slope avian species reach their southern limit in this region. In addition, several species (e.g., *Penelope dabbenei, Amazona tucumana*) that are endemic to the eastern Andean slope forests south of the Serrania de Cochabamba have not been recorded north of it. Here we present the results of ornithological surveys of the humid Río Paracti valley (also known in the literature as San Onofre and San José, Reynolds & Foster 1992), situated on the north slope of the Serrania de Cochabamba, approximately 43 km west of Villa Tunari, provincia Chapare, departmento Cochabamba, Bolivia (c. 17°08'S, 65°46"W) (Locality 3 in Fig. 1). The study area is located outside the northern boundary of Carrasco National Park, a large protected area that encompasses approximately 622,600 ha of montane forest (Fig. 1). Our surveys documented the occurrence of many Yungas species near the southern limit of their distribution.

STUDY AREA AND METHODS

Birds were intensively surveyed over an area of about 4 km^2 along the lower reaches of the Río Paracti valley. Geographic position was measured using a Magellan 12 XL GPS

FIG. 1. Landsat ETM image (232–072, 14 July 2000) of the Río Paracti valley. Localities mentioned herein include: (1) Locotal, 2) Miguelito, (3) San Onofre, (4) San Pedro, and (5) San José. The white line represents the limits of Carrasco National Park, the large gray and black line is the main Cochabamba-Santa Cruz highway, and the smaller gray and black lines are gravel roads. Our campsite was on the eastern side of the bridge crossing the Río Paracti at San Onofre.

receiver. Elevation was measured using a handheld altimeter. We accessed the valley by a gravel road that heads north from the main Cochabamba/Villa Tunari Highway, approximately 98 km east of Cochabamba (~1900 m a.s.l.; Reynolds & Foster 1992). The gravel road runs along the ridge several kilometers before beginning a winding descent to the Río Paracti (~1500 m a.s.l.). The river has very strong rapids and, because the bridge across it was washed-out, could only be crossed by a small cable car in 2000 and a narrow foot-

bridge in 2002. In 2002, the winding descending part of the road was washed out and impassable where it crossed several small drainages.

From 2000 to 2002, and in 2004, researchers from the Louisiana State University Museum of Natural Science (LSUMZ, Baton Rouge), the University of Washington's Burke Museum of Natural History (UWBM, Seattle), and the Museo de Historia Natural Noel Kempff Mercado (MNKM, Santa Cruz de la Sierra) conducted ornithological collecting expeditions and surveys to the central Río Paracti valley. Fieldwork was conducted on 26 July–7 August 2000 (R.T.B., C.G. Schmitt, D.C. Schmitt, G. Sánchez and A.M. Mamani), 9–17 April and 19–29 August 2001 (O.M.Z., G. Sánchez and E. Caballero), 11–15 April 2002 (R.T.B., O.M.Z., R.C. Faucett, V.G. Rohwer and R. Strem), and 16–18 October 2004 (G. Sánchez and M.A. Aponte). Additionally, O.M.Z. and E. Caballero spent 26–28 August 2001 at a small camp in the San José village (Locality 5 in Fig. 1), Río Mascota Mayu (17°04'25"S, 65°46'29"W, 1500 m), which lies c. 6.5 km north of San Onofre.

To our knowledge, the only other recent ornithological collections from the Río Paracti valley were made by Mercedes Foster from 25 October to 21 November 1979, with the official locality "Bolivia: depto. Cochabamba; Prov. Chapare, road to San Onofre, 3.3 km N road to Villa Tunari at Point 97.5 km from Cochabamba." These specimens were deposited into the collections of the Museum of Vertebrate Zoology (MVZ, University of Berkeley). A discussion of the herpetological fauna collected during that trip is presented in Reynolds & Foster (1992). Historically, several ornithological collections were made in the region of the Río Paracti valley at Miguelito, Locotal, and the Río San Jacinto valley (Fjeldså & Krabbe 1989, LeCroy & Sloss 2000). The upper parts of the gravel road leading down the Río Paracti valley are visited regularly by bird-watching groups. The gravel road is referred to as the Substation Trail (Rubey & Hennessey 2005), because it provides access to the San Jose Electricity Substation.

The species list (Appendix 1) is based primarily on specimens collected by shotgun or mist-nets from 2000 to 2002, but is supplemented by data from visual observations and tape-recordings. During 2000, approximately 20 nets, and in 2001 and 2002, approximately 10 nets were run daily (~8 h/day) for a total of approximately 2900 net-h. From 2000 to 2002, birds were also collected with two to four shotguns. All specimens were deposited into the ornithological collections of the MNKM, LSUMZ, or UWBM. In addition to a study skin or skeleton, samples of frozen tissue were preserved from all specimens collected in 2000 and 2002. Nests, eggs, embryos and young collected in 2001 and 2004 were deposited in the MNKM. Taxonomy follows the online classification proposal by Remsen *et al.* (2007).

Geologically, the Río Paracti valley is in a region that is part of the geomorphological formation known as the northern Subandean belt, a tectonic transition between the Amazon basin and the Eastern Cordillera of the Andes that encompasses the Yungas forest. The topography is extremely complex, with steep slopes having inclinations up to 80 degrees, but which range mainly between 30 and 60 degrees. The climate in this region is very humid, with a mean annual precipitation of 2694 mm and a mean annual temperature of approximately 19.6° C (Locotal climatic observatory, Navarro 2002). Because of the high rainfall and humidity, many small, high-flow, sinuous streams flow out of the higher valleys, and, upon reaching lower elevations, form a network of turbulent, stone-bottom rivers such as the Mascota Mayu, Ronco, Miguelito, San Jacinto and Santa Isabel that

join the Río Paracti, a tributary of the Río Juntas de Corani (Fig. 1).

Biogeographically, the Río Paracti valley comprises part of the Andina region, Yungas province, sector of the Yungas of Ichilo, district of the Yungas of Chapare (*sensu* Navarro 2002). The vegetation is classified as cloud forest (Reynolds & Foster 1992) or humid montane forest (Lötters & Köhler 2000, Maillard Z. & Caballero 2003). During our work there, the forest canopy was 20 to 25 m high, with a dense understory of shrubs and saplings. Most trees were heavily covered with a diversity of vascular epiphytes, including orchids and bromeliads, mosses, hepatics, ferns and lichens. Small patches of tree ferns (*Cyathea*) and bamboo (*Guadua, Chusquea*) were prevalent along the ridge top.

Timber in this region is cut primarily to create fields for farming, but it also provides an important resource to locals for fuel, construction of houses and production of agricultural implements. Colonization of this area probably began (or intensified) around 1952 when the Agrarian Reform took place after the Bolivian revolution. During the time we worked there, the area was inhabited by approximately 16 quechua-speaking families, mainly from nearby villages such as Colomi and Locotal. These families depended primarily on subsistence agriculture; the main cultivated species were yacón (*Polymnia sonchifolia*), ajipa (*Pachyrrhizus ahipa*), gualusa (*Xamthosoma sagittifolium*), and some fruits (e.g., banana, papaya, citrus). Most hunting pressure was on medium-sized mammals such as the paca (*Cuniculus paca*) and brown agouti (*Dasyprocta variegata*). Mammals observed on the study site included the night monkey (*Aotus*), capuchin (*Cebus*), tree squirrel (*Sciurus*), southern tamandua (*Tamandua tetradactyla*) and coati (*Nasua nasua*). Discussions with local people suggested the presence of spectacled bear (*Tremarctos ornatus*) in densely forested areas close to San Pedro village (also called San Pedrito, locality 4 in Fig. 1).

SPECIES ACCOUNTS

Sickle-winged Guan (Chamaepetes goudotii). An individual of this cracid was observed briefly by M. Aponte on 17 October 2004 at 07:15 h (1500 m) as the bird perched on the top branches of a tall *Cecropia* sp. (Cecropiaceae) tree. No other individual was seen in the area. This record represents a southeastern range extension within Bolivia (c. 250 km), the first published record from Cochabamba department (Hennessey *et al.* 2003b), and the third published record for Bolivia (Cardiff & Remsen 1981, Remsen & Traylor 1983). A specimen would be extremely desirable in corroborating this record. To our knowledge, the only other Bolivian record of this species is a sight record by F. Sagot below Pelechuco (S. Herzog, pers. comm.).

Lanceolated Monklet (Micromonacha lanceolata). On 29 July 2000, a male was netted in the understory forest along the descending road, approximately 500 m from the river. The bird was prepared as a study skin and partial skeleton (LSUMZ 171211, skull 100% oss., body mass 22.0 g, light subcutaneous fat, no molt or bursa, left testis 3 x 1 mm, right testis 1 x 0.5 mm). The specimen was collected from a higher elevation (~1500 m) than was previously reported for the species in Bolivia (1300 m; Hennessey *et al.* 2003b). This represents the southernmost record for the species, the first specimen record of the species for Bolivia, the first record for Cochabamba Department, and the fourth documentation of the species in Bolivia (Hennessey *et al.* 2003a). Hennessey *et al.* (2003a) noted an unpublished July 1998 observation of this species in Carrasco National Park by Allan Mee, which would constitute the southernmost record and the first record for Cocha-

bamba Department. This record is probably an error, however, because an unpublished report by A. Mee *et al.* detailing their ornithological survey of Carrasco (7 August to 8 October, 1998) mentioned only a 26 October 1998 sight observation by Rebecca Denny in Cotapata National Park that represented the southernmost record. Our efforts to contact A. Mee to confirm the sighting were unsuccessful.

Yellow-rumped Antwren (Terenura sharpei). This small thamnophilid inhabits the canopy and borders of humid montane forests in western Bolivia and southeastern Perú at elevations from 750 to 1700 m (Remsen *et al.* 1982, Collar *et al.* 1992, Ridgely & Tudor 1994, Zimmer & Isler 2003). The Yellow-rumped Antwren is a poorly known species, currently categorized by BirdLife International (2000) as vulnerable based on its small geographical range. Other than a few sight records (e.g., Hennessey & Gomez 2003), the species is known in Bolivia from the type specimen [a male collected from "Quebrada Onda, e. Yungas", Departamento Cochabamba (Berlepsch 1901)] and, more recently, from a male and female collected at Serrania Bellavista, 35 km by road N Caranavi, 1350 m in La Paz Department (Remsen *et al.* 1982). There have been no published specimen reports since that time. On 3 August 1993, Steven W. Cardiff collected a female from a mixed species canopy-flock in humid forest at 83 km by road E Charazani, Cerro Asunta Pata, 1300 m in La Paz Department (15º03'S, 68º29'W). On 31 July 2000, R.T.B. collected a male from a mixed species flock in the Río Paracti valley (1500 m). The male, foraging only about 4 m above the forest floor, climbed up the main stalk of saplings, gleaning insects from live leaves along the way. The specimen (LSUMZ 171313; 8.1 g; left testis 3.5 x 2 mm; right testis 2 x 1 mm; skull 100% oss.; no bursa; trace fat) is typical in plumage of the male LSUMZ specimen from La Paz. Its voice was not recorded.

A recent description of the female plumage (Zimmer & Isler 2003) included a reference to the "lower back and rump" as "yellowish-olive." This description of the rump is inconsistent with the female collected in 1993 (LSUMZ 162682; 7.6 g; ovary 6 x 3 mm; largest ova 0.5 mm; oviduct 2 mm wide convoluted and thickened; skull 50% oss.; no bursa; light fat), which, like the male, has a bright yellow rump. We suggest that this specimen more likely represents the adult female plumage, and that previous descriptions (Remsen *et al.* 1982, Zimmer & Isler 2003) refer to a juvenile female plumage or perhaps to the juvenile plumage of both sexes. The closely related Rufous-rumped Antwren (*T. callinota*) also has pigmented rumps in the adult plumages of both sexes (Zimmer & Isler 2003).

Based on the 1993 specimen, a formal description of the adult female morphology is: maxilla (in life) black; mandible (in life) dark gray with dull flesh at center of base; throat and chin dull white, darkening to greyish-white on chest, this fading to dull white in center of middle belly and becoming bright greenish-yellow in center of lower belly; sides and flanks yellowish-green; under-tail coverts pale dull yellowish-green; supraloral region and forehead pale dusky buff with dull buffy white superciliary extending from lores to auricular region; auriculars pale gray; back bright olive-green with a few bright yellow feathers in middle back; rump bright yellow with posterior-most feathers tipped olive-green; upper tail-coverts olive-green; primaries and secondaries dark dusky with bright olive-green outer edges extending to within 1 cm of feather tips; greater and median primary and secondary coverts dark dusky, each feather with broad bright whitish-yellow tip; underwing-coverts bright yellow; rectrices dusky, outer webs

edged olive-green; tarsi and feet (in life) dull leaden-blue.

The availability of only four modern specimens made concluding anything about geographic variation or sexual dimorphism in the Yellow-rumped Antwren somewhat speculative. The two female specimens were in different plumages as noted above, and the males from La Paz and Cochabamba Departments did not show any obvious differences in plumage color or pattern. Measurements (to nearest 0.5 mm) by R.T.B. with dial calipers suggested that the sexes may differ in wing-length (chord of unflattened wing from bend of wing to longest primary), but not in culmen-length (from anterior edge of nare to tip), bill-width (at its base), tail-length (measured from point of insertion of central rectrices to tip of longest rectrix), or tarsus-length (from the joint of tarsometatarsus and tibiotarsus to the lateral edge of last undivided scute). Wing-length measurements for the males were 54.3 mm (LSUMZ 90723) and 53.7 mm (LSUMZ 171313), and for the females 51.0 mm (LSUMZ 90722) and 50.8 mm (LSUMZ 162682).

Gonad information from the four specimens indicates that the nesting season in Bolivia probably begins in late August or early September. The relatively enlarged ovary and convoluted and thickened oviduct in the 1993 bird, collected on 3 August, indicate that she was coming into breeding condition. Both males had relatively enlarged testes.

Fulvous-breasted Flatbill (Rhynchocyclus fulvipectus*).* An individual of this species was observed by G. Sánchez and M. Aponte on 16 October 2004, perched on a dead branch at the edge of the Río Paracti (1500 m), approximately 0.4 m over a pendant, closed and pyriform nest. The bird entered the nest with a winged insect in its bill. The nest (MNKM 4181), positioned 12 m above the river, was constructed on a branch (thickness 1.8–3.2 mm) of an epiphytic *Peperomia* sp. (Piperaceae). The nest was constructed of thin roots, grasses, dead leaves, twigs and others plant fibers. The structure and dimensions (overall length 47 cm, chamber outside 17.5 x 24.5 x10.5 cm, tubular entrance 10 x 4.5 cm) were similar to those reported by Greeney *et al.* (2004), but differed from nests described by Parker & Parker (1982). Approximately 70% of the nest was covered with living mosses (*Meteoridium remotifolium*, *Orthostichella versicolor, Phyllogonium fulgens, Porotrichum filiferum, Rhynchostegium* cf. *scariosum, Thuidium tomentosum*) and hepatics (*Marchesinia brachiata*, *Omphalanthus filiformis, Plagiochila longiramea, Radula* cf. *javanica*). The nest contained two well-feathered nestlings of body mass 30 g and 33 g, respectively. The juvenal plumage of these specimens appears like that of the adults. To our knowledge this is only the fourth nest reported for this species, and the first nest description for Bolivia. We also note that there are relatively few records of this species from the lower Bolivian Yungas.

Black Phoebe (Sayornis nigricans*).* An adult was seen by O.M.Z. on 23 August 2001 incubating two white eggs (23.2 x 15.2 mm and 24.5 x 16.2 mm) in a cup nest (MNKM 4184) located 1.5 m under the Río Paracti bridge. The outer diameter of the nest was approximately 9.5 cm, the outer height of the cup was 5.7 cm, and the inner depth 3 cm. On 27 August, 2001 at Río Mascota Mayu, E. Caballero discovered a nest containing two unfeathered nestlings and one partially incubated egg. The nest was located 1.3 m above the river.

Golden-crowned Flycatcher (Myiodynastes chrysocephalus). On 16 October 2004, G. Sánchez and M. Aponte observed two individuals perched on an epiphyte catching insects and carrying them to a nest 4.5 m above the water

surface. This appears to be the first nesting report of this species for Bolivia.

Masked Tityra (Tityra semifasciata). Between 14 and 17 April 2001, O.M.Z., E. Caballero and G. Sánchez observed two individuals carrying nest material to an abandoned woodpecker hole in a *Cecropia* sp. (diameter ca. 46 cm), ca. 5 m above ground at a forest border. A male (MNKM 3536) collected on 27 July 2000, had a testis (8 x 5 mm) of apparent breeding size and was not molting. Hennessey *et al.* (2003a) reported a Masked Tityra collecting nest material in July in the Pilón Lajas Biosphere Reserve and Communal Lands (La Paz and Beni departments).

Magpie Tanager (Cissopis leverianus*)*. On 14 April 2001, O.M.Z., E. Caballero and L. Acosta observed a flock of five individuals in moderately dense scrub at 1700 m. On 16 and 17 October 2004 several individuals were observed by G. Sánchez and M. Aponte moving in the upper canopy of the disturbed forest along the San Onofre–San José trail (1450 m). Both records represent the highest elevation reported for the species in Bolivia. The highest previous record was 1000 m (Hennessey *et al.* 2003b).

Rust-and-yellow Tanager (Thlypopsis ruficeps). During our fieldwork in 2000, this species was one of the most common midstory and canopy forest birds, with groups of 20 to 30 individuals seen daily flocking with Common Bush-Tanager (*Chlorospingus opthalmicus*). In 2002, this species was conspicuously absent, suggesting these austral migrants may have not yet arrived (Hennessey *et al.* 2003b).

Short-billed Bush-Tanager (Chlorospingus parvirostris). On 30 July 2000, a male was netted in the forest understory near a small stream approximately 100 m from the river. On 3 August 2000, a female was netted in the same area. Both were prepared as study skins (male: MNKM 3620, skull damaged, not ossified, body mass 22.0 g, no fat, no body molt, testis 3 x 3 mm; female: LSUMZ 171456, skull 100% oss., body mass 19.5 g, no molt or bursa, ovary 5 x 3 mm and granular). These represent the first and second specimen records for Cochabamba department. The only other published documentation of the species' occurrence in the department was a sighting from the Cordillera de Cocapata (MacLeod *et al.* 2005) to which Hennessey *et al.* (2003b) made reference.

Dusky-green Oropendola (Psarocolius atrovirens). On 28 August 2001, O.M.Z. and L. Acosta collected two nests (MNKM 4182, 4183) of this species from nesting colonies along the San Onofre–San José trail. The nests were hanging from an *Aiphanes* sp. palm (Arecaceae), approximately 5 m above ground. The nests dimensions were 90 cm (entrance-bottom 49 cm) and 105 cm (entrance-bottom 60 cm) length, respectively, by 21 and 22 cm wide. Nest materials included c. 4–180 cm long flexible vines, stems, grasses, leaves and others plant fibers. Both nests contained dry and green leaves that weighed 54.3 g (MNKM 4182; Bromeliaceae 43%, Musaceae 27%, unidentified 26%, Arecaceae 4%) and 55 g (MNKM 4183; unidentified 45%, Musaceae 23%, Bromeliaceae 24%, Arecaceae 8%). Each nest contained two light greenish-white eggs with small spots, blotches and varied shades of black, brown and gray that were heaviest around the broader end. This description differs somewhat from that provided by Jaramillo & Burke (1999), "off-white, with brown splotching which is concentrated at the broader end of the egg." Average egg measurements (n = 4) were 40.5 x 26.3 mm. Subsequently, on 29 August, O.M.Z. observed four nests hanging from two moss-covered branches (<5 cm diameter) in a tree, c. 10 m above the water

surface. The nests were on the south side of the Río Mascota Mayu, at an elevation of 1350 m. Several adults were observed outside the nests.

Two specimens were collected on 27 July 2000. The female (LSUMZ 171503, ovary 12 x 5 mm; largest ova 1.5 mm; oviduct 3 mm wide convoluted) showed enlarged gonads, while the male (MNKM 3538, testis 3 x 1 mm) was not in reproductive condition. On 21 August 2001, G. Sánchez collected a male (MNKM 2115, testis 10.14 x 6.9 mm) in breeding condition.

DISCUSSION

Based on our collecting expeditions in 2000, 2001, and 2002, a 1979 expedition by M. S. Foster, and visits made in 2004, we tallied 121 species of birds in the Río Paracti valley (Appendix 1). We found most species in the humid forests along the winding and descending road, with the rest occurring as fly-overs [Turkey Vulture (*Cathartes aura*)], Andean Condor (*Vultur gryphus*), Swallow-tailed Kite (*Elanoides forficatus*)] or associated with the river [Torrent Duck (*Merganetta armata*), Ringed Kingfisher (*Megaceryle torquata*), Torrent Tyrannulet (*Serpophaga cinerea*), Black Phoebe (*Sayornis nigricans*), White-capped Dipper (*Cinclus leucocephalus*)]. Excluding species that were only observed passing over the study site, the remaining 118 species represent the core avifauna (Remsen 1994).

That M. S. Foster collected several species in 1979 that we did not observe during our recent trips (e.g., *Amazona mercenaria, Aulacorhynchus coeruleicinctus, Xiphorhynchus triangularis, Myiophobus inornatus, Platycichla leucops*) may be attributed to her focus on the upper reaches of the road and our focus on the lower reaches of the road. From the main highway, the road to the Río Paracti descends approximately 8 road km before reaching the river. Approximately 95% of our mist-netting and hunting effort extended no more than 2 km beyond our campsite at the river's edge (~ 1500–1700 m a.s.l.). Differences in the avifauna between the forest along the river and habitat along the ridge (the road follows the top of a ridge before descending to the river) were apparent. For example, the Upland Antshrike (*Thamnophilus aroyae*) was found exclusively along the lower reaches of the road near the river and the Variable Antshrike (*T. caerulescens*) was found exclusively along the upper reaches of the road. The two were never observed syntopically. Other species pairs that appeared to replace each other elevationally and which were never observed syntopically included *Aulacorhynchus derbianus*/*A. coeruleicinctus* and *Xiphorhynchus ocellatus*/*X. triangularis*.

Austral migrants represented a small percentage of the core avifauna. We observed Vermilion Flycatcher (*Pyrocephalus rubinus*) in April 2001 and 2002, but did not collect any specimens that would enable us to assess reproductive condition or fat. Chesser (1997) reported three November and one early December specimen records of this species from Cochabamba Department, suggesting it could be a breeder here. Other possible austral migrants include a Euler's Flycatcher (*Lathrotriccus euleri*; LSUMZ 171371) collected on 27 July 2000, two Dusky-capped Flycatchers (*Myiarchus tuberculifer atriceps*; MNKM 4180, UWBM 7291) collected on 2 August 2000 and 14 April 2002, and Rust-and-yellow Tanager (see Species Account).

One to two understory mixed-species flocks were encountered daily along the road near our camp. Most of these flocks included a male and female Versicolored Barbet (*Eubucco versicolor*), as well as Masked Trogon (*Trogon personatus*), Golden-olive Woodpecker (*Piculus rubiginosus*), Spotted Barbtail (*Premnoplex brunnescens*), Montane Foliage-gleaner (*Anabacerthia striaticollis*), Olivaceous Wood-

creeper (*Sittasomus griseicapillus*), Marble-faced Bristle-Tyrant (*Phylloscartes opthalmicus*), Slaty-capped Flycatcher (*Leptopogon superciliaris*), Cinnamon Flycatcher (*Pyrrhomyias cinnamomeus*), Common Bush-Tanager, and Slate-throated Redstart (*Myioborus miniatus*). The male Yellow-rumped Antwren that we collected was part of one of these flocks. Mixed-species tanager flocks observed in this same area included Orange-eared Tanager (*Chlorochrysa calliparaea*), Golden Tanager (*Tangara arthus*), Saffron-crowned Tanager (*Tangara xanthocephala*), Spotted Tanager (*Tangara punctata*), Blue-necked Tanager (*Tangara cyanicollis*), and Blue Dacnis (*Dacnis cayana*). Mixed-species mid-story/canopy flocks near camp contained Slaty-capped Flycatcher, Bolivian Tyrannulet (*Zimmerius bolivianus*), Marble-faced Bristle-Tyrant, Brown-capped Vireo (*Vireo leucophrys*), eight to twelve individuals of Rust-and-yellow Tanager (only observed in year 2000), four to eight individuals of Common Bush-Tanager, Tropical Parula (*Parula pitiayumi*), and Orange-bellied Euphonia (*Euphonia xanthogaster*). Two kilometers upslope from the camp we observed mixed-species flocks along the road composed of Blue-winged Mountain-Tanager (*Anisognathus somptuosus*), Capped Conebill (*Conirostrum albifrons*), Rusty Flowerpiercer (*Diglossa sittoides*), Deep-blue Flowerpiercer (*Diglossa glauca*), Masked Flowerpiercer (*Diglossa cyanea*), and Common Bush-Tanager. In accord with Hennessey *et al.* (2003a) we note that the species composition of these flocks was more fluid than has been reported in Amazonian mixed-species flocks.

Between 2000 and 2004 we estimate that 50% of the easily accessible forest along the lower reaches of the road was converted from forest to farm, and it seems likely that within the next few years most accessible forest along the road will be converted to arable land. Carrasco National Park affords some protection in this region, but, with intense deforestation outside the park, it may soon become an island of forest in a sea of human-modified habitats. Species that are restricted to narrow elevational ranges are especially vulnerable to habitat destruction, because their biology disallows an escape to intact forests that may persist at higher or lower elevations. Although we were able to spend only a relatively short amount of time surveying the site, we recorded six of the 15 restricted-range species identified by Stattersfield *et al.* (1998). The conservation status of one of these, the Yellow-rumped Antwren is considered Vulnerable (BirdLife International 2000). Situated in one of the most biologically diverse regions of the world, it is our hope that Carrasco National Park and the beautiful and easily accessible Río Paracti valley will present a foundation for the development of land use practices that benefit both the local community and its birds (Chicchon 2000).

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APPENDIX 1. Species list of birds encountered in the Río Paracti valley. Numbers indicate the number of specimens collected for each species along with information in parentheses as to where the specimen is archived (L = Louisiana State University Museum of Zoology, N = Museo de Historia Natural Noel Kempff Mercado, B = University of Washington's Burke Museum of Natural History, M = Museum of Vertebrate Zoology). Species that were observed, but not collected, are indicated by an "x" if seen or a "v" if heard. Relative abundance codes are referable to those presented by Stotz *et al.* (1996): C = greater than or equal to 10 individuals observed per day, FC = 4–10 individuals per day, U = 1–3 per day, and R = less than 1 per day. Avian taxonomy follows the classification of the South American Checklist Committee (Remsen *et al.* 2007).

English names	Scientific names	Oct.–Nov. 1979	July–August 2000	April 2001	August 2001	April 2002	October 2004	Relative abundance
Brown Tinamou	*Crypturellus obsoletus*			1 (N)	x	x	x	U
Torrent Duck	*Merganetta armata*		x	x		x		U
Andean Guan	*Penelope montagnii*			1 (N)			x	R
Sickle-winged Guan	*Chamaepetes goudotii*						x	R
Turkey Vulture	*Cathartes aura*		x	x	x	x	x	FC
Andean Condor	*Vultur gryphus*				x			R
Swallow-tailed Kite	*Elanoides forficatus*		x		x			R
Sharp-shinned Hawk	*Accipiter striatus*		1 (N)					R
Roadside Hawk	*Buteo magnirostris*			x	1 (N)			U
Sunbittern	*Eurypyga helias*					1 (N)	x	R
Band-tailed Pigeon	*Patagioenas fasciata*			x	x			FC
Plumbeous Pigeon	*Patagioenas plumbea*		1 (B)	x	2 (N)	x	x	FC
Green-cheeked Parakeet	*Pyrrhura molinae*		3 (L)	x	x	1 (N)	x	C
Red-billed Parrot	*Pionus sordidus*		1 (L)	x	x	x	x	FC
Scaly-naped Parrot	*Amazona mercenaria*	1 (M)					x	C
Squirrel Cuckoo	*Piaya cayana*		1 (L), 1(N)	x	1 (N)	1 (N)	x	FC
Owl	*Pulsatrix* sp.			v	v	v		U
Great-billed Hermit	*Phaethornis malaris*		1 (L)	x	x	2 (N)	x	C
Green-fronted Lancebill	*Doryfera ludovicae*		1 (L)		x			U
Sparkling Violet-ear	*Colibri coruscans*		1 (L)	x		x	x	C
Rufous-crested Coquette	*Lophornis delattrei*		1 (L)					FC
Fork-tailed Woodnymph	*Thalurania furcata*		3 (L)	x	x	x		C

APPENDIX 1. Continued.

English names	Scientific names	Oct.–Nov. 1979	July–August 2000	April 2001	August 2001	April 2002	October 2004	Relative abundance
Speckled Hummingbird	*Adelomyia melanogenys*	3 (M)	5 (L)		x	1(N)		C
Violet-fronted Brilliant	*Heliodoxa leadbeateri*		1 (L)					U
Booted Racket-tail	*Ocreatus underwoodii*			x	x	1 (N)		U
Long-tailed Sylph	*Aglaiocercus kingi*					1(N)		U
Wedge-billed Hummingbird	*Schistes geoffroyi*		1 (L)					R
Masked Trogon	*Trogon personatus*		1 (L), 2 (N)		x		x	FC
Ringed Kingfisher	*Megaceryle torquata*			x	x	x		U
Black-streaked Puffbird	*Malacoptila fulvogularis*		1 (L), 3 (N)		x	1 (B)		FC
Lanceolated Monklet	*Micromonacha lanceolata*		1 (L)					R
Versicolored Barbet	*Eubucco versicolor*		5 (L), 4 (N)		x	3 (B), 3 (N)	x	C
Channel-billed Toucan	*Ramphastos vitellinus*		x					U
Chestnut-tipped Toucanet	*Aulacorhynchus derbianus*		5 (L), 3 (N)	x	x	2 (B)	x	FC
Blue-banded Toucanet	*Aulacorhynchus coeruleicinctis*	1 (M)						U
Smoky-brown Woodpecker	*Veniliornis fumigatus*		2 (L), 1 (N)				x	U
Golden-olive Woodpecker	*Piculus rubiginosus*		1 (L), 1(N)	1 (N)	2 (N)	1 (B), 2 (N)	x	U
Crimson-mantled Woodpecker	*Piculus rivolii*		1 (L)					U
Lineated Woodpecker	*Dryocopus lineatus*			1 (N)			x	U
Red-necked Woodpecker	*Campephilus rubricollis*		1 (N)	x	1 (N)		x	U
Azara's Spinetail	*Synallaxis azarae*		1 (N)					FC
Spotted Barbtail	*Premnoplex brunnescens*		2 (L), 5 (N)		x	1 (B)	x	FC
Montane Foliage-gleaner	*Anabacerthia striaticollis*	1 (M)	5 (L), 2 (N)	x	x	1 (B), 1 (N)		FC
Rufous-rumped Foliage-gleaner	*Philydor erythrocercum*		1 (L)	x				FC
Striped Treehunter	*Thripadectes holostictus*		2 (L), 1 (N)					FC
Streaked Xenops	*Xenops rutilans*		1 (L)		x			U
Olivaceus Woodcreeper	*Sittasomus griseicapillus*		3 (N)	1 (N)	1 (N)		x	FC
Strong-billed Woodcreeper	*Xiphocolaptes promeropirhynchus*		1 (L)	x	x		x	U
Ocellated Woodcreeper	*Xiphorhynchus ocellatus*		3 (L), 2 (N)		x	1 (N)	x	FC
Olive-backed Woodcreeper	*Xiphorhynchus triangularis*	2 (M)						U
Upland Antshrike	*Thamnophilus aroyae*		4 (L), 1 (N)	x	x	1 (B)	x	FC

APPENDIX 1. Continued.

English names	Scientific names	Oct.–Nov. 1979	July–August 2000	April 2001	August 2001	April 2002	October 2004	Relative abundance
Variable Antshrike	*Thamnophilus caerulescens*		20 (B)	x	1 (N)	5 (B)	x	FC
Plain Antvireo	*Dysithamnus mentalis*		x	x		1 (B)		U
Stripe-chested Antwren	*Myrmotherula longicauda*		1 (N), 2(L)	x	x	2 (B)		FC
Yellow-rumped Antwren	*Terenura sharpei*		1 (L)					R
White-backed Fire-eye	*Pyriglena leuconota*		1 (L), 4 (N)	x		x	x	FC
Short-tailed Antthrush	*Chamaeza campanisona*		x	x	x	1 (B), 1 (N)	x	FC
Scaled Antpitta	*Grallaria guatimalensis*		1 (L)		x		x	FC
Slaty Gnateater	*Conopophaga ardesiaca*		3 (L), 1 (N)	x			x	FC
Bolivian Tapaculo	*Scytalopus bolivianus*			x	x	1 (N)	x	FC
Torrent Tyrannulet	*Serpophaga cinerea*				x	x	x	U
Bolivian Tyrannulet	*Zimmerius bolivianus*		1 (L), 1(N)		x	1 (B)		FC
Marble-faced Bristle-Tyrant	*Phylloscartes opthalmicus*		4 (L), 1 (N)	x	x	1 (B)		FC
Streak-necked Flycatcher	*Mionectes striaticollis*	2 (M)	4 (L), 5 (N)		x		x	FC
Slaty-capped Flycatcher	*Leptopogon superciliaris*		6 (L), 6 (N)		x	1 (B), 1 (N)		FC
Yungas Tody-Tyrant	*Hemitriccus spodiops*		3 (L), 1 (N)			1 (B)		FC
Ochre-faced Tody-Flycatcher	*Poecilotriccus plumbeiceps*		1 (L)	x				U
Fulvous-breasted Flatbill	*Rhynchocyclus fulvipectus*						2 (N)x	U
Unadorned Flycatcher	*Myiophobus inornatus*	2 (M)						U
Cinnamon Flycatcher	*Pyrrhomyias cinnamomeus*		1 (N)			1 (B)		FC
Euler's Flycatcher	*Lathrotriccus euleri*		1 (L), 1(N)	x	x			U
Black Phoebe	*Sayornis nigricans*		1 (L), 1(N)	x	1 (N)	1 (N)	x	U
Vermilion Flycatcher	*Pyrocephalus rubinus*			x		x		U
Dusky-capped Flycatcher	*Myiarchus tuberculifer*		1 (L), 1(N)			1 (B)		U
Pale-edged Flycatcher	*Myiarchus cephalotes*		1 (L)		x		x	U
Band-tailed Fruiteater	*Pipreola intermedia*					2 (N)		R
Andean Cock-of-the-rock	*Rupicola peruvianus*		1 (L)	x	x	1 (N)	x	U
Amazonian Umbrellabird	*Cephalopterus ornatus*		x	x	x		x	R
Yungas Manakin	*Chiroxiphia boliviana*	4 (M)	3 (L), 5 (N)		x		x	C
Masked Tityra	*Tityra semifasciata*		1 (N)	x	x		x	FC

APPENDIX 1. Continued.

English names	Scientific names	Oct.–Nov. 1979	July–August 2000	April 2001	August 2001	April 2002	October 2004	Relative abundance
Wing-barred Piprites	*Piprites chloris*		1 (L), 2 (N)					U
Brown-capped Vireo	*Vireo leucophrys*		1 (L), 1(N)		x	1 (N)		FC
Green Jay	*Cyanocorax yncas*						x	U
Moustached Wren	*Thryothorus genibarbis*		2 (L), 1 (N)	x		x	x	FC
Gray-breasted Wood-Wren	*Henicorhina leucophrys*			x		1 (B)	x	FC
White-capped Dipper	*Cinclus leucocephalus*		x	x	1 (N)	x	x	U
Andean Solitaire	*Myadestes ralloides*		3 (L), 2 (N)			1 (N)		U
Spotted Nightingale-Thrush	*Catharus dryas*		1 (L), 1(N)	x	1 (N)	x		U
White-eared Solitaire	*Entomodestes leucotis*				x	1 (N), 1 (B)	x	U
Pale-eyed Thrush	*Platycichla leucops*	1 (M)						U
Slaty Thrush	*Turdus nigriceps*		1 (L), 2 (N)		1 (N)	x		FC
White-necked Robin	*Turdus albicollis*		1 (L), 3 (N)	x	3 (N)	x	x	FC
Magpie Tanager	*Cissopis leverianus*		x	x			x	U
Rust-and-yellow Tanager	*Thlypopsis ruficeps*		2 (L), 6 (N)			x		FC
Black-eared Hemispingus	*Hemispingus melanotis*		1 (L), 2 (N)			1 (B)		FC
Silver-beaked Tanager	*Ramphocelus carbo*		1 (N)	x		x	x	FC
Blue-winged Mountain-Tanager	*Anisognathus somptuosus*		1 (L)		x	2 (N)		FC
Orange-eared Tanager	*Chlorochrysa calliparaea*		1 (L)					U
Golden Tanager	*Tangara arthus*		1 (L)			2 (B)		FC
Saffron-crowned Tanager	*Tangara xanthocephala*		1 (L), 1(N)	1 (N)	x	3 (B), 4 (N)	x	FC
Spotted Tanager	*Tangara punctata*		1 (L), 1(N)			2 (B)	x	FC
Blue-necked Tanager	*Tangara cyanicollis*		1 (L), 1(N)	x	1 (N)	1 (B)		U
Capped Conebill	*Conirostrum albifrons*	2 (M)						FC
Rusty Flowerpiercer	*Diglossa sittoides*		2 (L), 1 (N)					FC
Deep-blue Flowerpiercer	*Diglossa glauca*					1 (B)		U
Masked Flowerpiercer	*Diglossa cyanea*		x					U
Common Bush-Tanager	*Chlorospingus ophtalmicus*	1 (M)	3 (L), 2 (N)	x	x	6 (B), 6 (N)	x	C
Short-billed Bush-Tanager	*Chlorospingus parvirostris*		1 (L), 1 (N)					R
White-winged Tanager	*Piranga leucoptera*		1 (L)		1 (N)		x	U

APPENDIX 1. Continued.

English names	Scientific names	Oct.–Nov. 1979	July–August 2000	April 2001	August 2001	April 2002	October 2004	Relative abundance
Stripe-headed Brush-Finch	*Buarremon torquatus*		2 (N)	x	1 (N)	1 (N)		U
Rufous-naped Brush-Finch	*Atlapetes rufinucha*		1 (L), 1(N)		x			U
Buff-throated Saltator	*Saltator maximus*		1 (N)	x	1 (N)			FC
Slate-throated Redstart	*Myioborus miniatus*		1 (L), 1 (N)		x			FC
Two-banded Warbler	*Basileuterus bivittatus*		1 (L)				x	U
Three-striped Warbler	*Basileuterus tristiatus*		8 (L), 6 (N)	x		x	x	C
Russet-backed Oropendola	*Psarocolius angustifrons*				1 (N)		x	U
Dusky-green Oropendola	*Psarocolius atrovirens*		1 (L), 1(N)	x	1 (N)	1 (N)	x	FC
Giant Cowbird	*Molothrus oryzivorus*		1 (L)	x	x	x	x	FC
Hooded Siskin	*Carduelis megallanica*		x	x	x			U
Bronze-green Euphonia	*Euphonia mesochrysa*		1 (N)		x	x		U
Orange-bellied Euphonia	*Euphonia xanthogaster*	1 (M)	1 (L), 1(N)			1 (B)	x	U