Four more records of Rusty Tinamou *Crypturellus brevirostris* in Colombia and a revision of its known range

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Reportamos aquí cuatro registros adicionales de la Panguanita Oxidada *Crypturellus brevirostris* en la Amazonía colombiana y realizamos una revisión de su distribución conocida. A partir de un muestreo acústico pasivo, detectamos cuatro sitios adicionales a los reportados recientemente en los alrededores de Araracuara, departamento de Caquetá, Colombia. Estos registros pueden soportar iniciativas de uso sostenible de biodiversidad por parte de las comunidades de Araracuara; por ejemplo, fortaleciendo actividades de aviturismo. Futuro trabajo colaborativo con comunidades locales podría ayudar a entender mejor la biología de este poco conocido especialista de suelos pobres amazónicos que muy probablemente es residente de Colombia.

Rusty Tinamou *Crypturellus brevirostris* is a forest-dwelling species discontinuously distributed in northern Amazonia and the Guiana Shield[4,8]. As with other members of the genus *Crypturellus*[19,23], its vocalisations are often the first and only way to detect it in the field[5]. Although this species has been described as "fairly common"[29], there is a lack of studies providing estimates of its global population size and information on its life history[4,8]. Not even its habitat preferences are well known, being reported both in *terra firme*[21,24] and seasonally flooded forests[8,24]. Once thought to be endemic to the upper Amazon basin, *C. brevirostris* was until recently considered hypothetical for north-western Amazonia[3,10,12,16,25].

Recently, Socolar *et al.*[25] reported substantial range extensions for birds near the Araracuara area in the central Amazon of Colombia, including *C. brevirostris*. The study also discusses the distribution of white-sand and other poor-soil specialists in north-western Amazonia, which have proved more widespread and less patchy than previously thought[25,26]. Before Socolar *et al.*'s expeditions[25], *C. brevirostris* was only hypothetical in Colombia[10], with a single observation from Serranía de Naquen in Guainía[16] that prompted its inclusion in Colombian field guides[3]. By the time of Socolar *et al.*'s first expeditions to the remote area of Araracuara (August 2019)[25], OAC was coordinating a research agenda on acoustics for the Instituto Humboldt in Colombia[15] and oversaw the deployment of six autonomous Acoustic Recording Units (hereafter, ARUs)[1] at Loma de Cotudos (Fig. 1)[25]. Revisiting the acoustic data, we detected a vocalisation of *C. brevirostris*. We contextualised our record by reviewing the available distribution information of the species[5,8,9,21,24,25].

Methods

Six ARUs were deployed on a transect at Loma de Cotudos[1,25], Yarí River (Fig. 1), from 8–12 August 2019. The ARUs were programmed to be active for 1 minute and inactive for 9 minutes, gathering 144 recordings per day per site ($n = 3,260$ recordings) at a sample rate of 44.1 kHz and at 16-bit resolution. We used ARBIMON portable recorders, which consist of LG cell phones containing the ARBIMON touch app. The recordings were normalised to ~3 kHz[2], then uploaded to the Rainforest Connection ARBIMON platform (https://rfcx.org), where we reviewed some of the recordings in a non-systematic way. With a single detection of *C. brevirostris* at 20h10 on 11 August 2019 at the site ARU1 (0°32'34.8" S, 72°15'25.2" W; 175 m elevation), we ran a Pattern Matching (PM) model that returned another three detections (Fig. 2A–D). This PM model is a supervised template-matching analysis included in ARBIMON. It uses a window of the spectrogram (a template) to search for similar sounds in time-frequency domain coordinates within a user-defined playlist of recordings[14,20], in our case the entire audio dataset.

To contextualise our records within the distribution of the species, we searched for physical specimens in the Global Biodiversity Information Facility ($n = 18$; only 5 georeferenced). We also extracted eBird records *sensu lato* ($n = 50$) and filtered the records to include only complete checklists (travelling or stationary) ⩽5 km or ⩽5 h[13], which significantly reduced the number of records (n = 7). (For reference, the R code used in these procedures is at https://github.com/OACColombia/RustyTinamou[11,30].) Additionally, we extracted acoustic records from xeno-canto ($n = 13$; http://tinyurl.com/xeno-canto) and Macaulay Library ($n = 6$; http://tinyurl.com/MacaulayLibrary). Then, using the program QGIS v3.14, we combined all these