

New camera-trap records for bush dog (*Speothos venaticus*) in Colombia

Paola Rodríguez-Castellanos¹, Germán Garrote^{2*} & Fernando Trujillo¹

1. Fundación Omacha, Calle 84 No. 21 - 64, Barrio El Polo, Bogotá D.C., Colombia.

2. Instituto de Biología de la Conservación, 23391 Torres de Albánchez, Jaén, España.

*Autor para correspondencia: gergarrote@gmail.com

The bush dog *Speothos venaticus* (Lund, 1824) occurs in Central and South America, from Costa Rica to Argentina and it is globally listed as Near Threatened (DeMatteo *et al.* 2011) on the basis of an estimated decline of 20–25% over the past 12 years that is attributable to multiple threats, including continuous habitat loss and fragmentation, a reduction in prey abundance due to illegal hunting, predation by domestic dogs, and the increased risk of infection by canid-related diseases (DeMatteo *et al.* 2011). The few available data on the distribution and ecology of the bush dog are chiefly derived from opportunistic sightings since standard field techniques have had little or no success in detecting this species (DeMatteo & Loiselle 2008). It is thus one of the least known Neotropical canids (DeMatteo & Loiselle 2008).

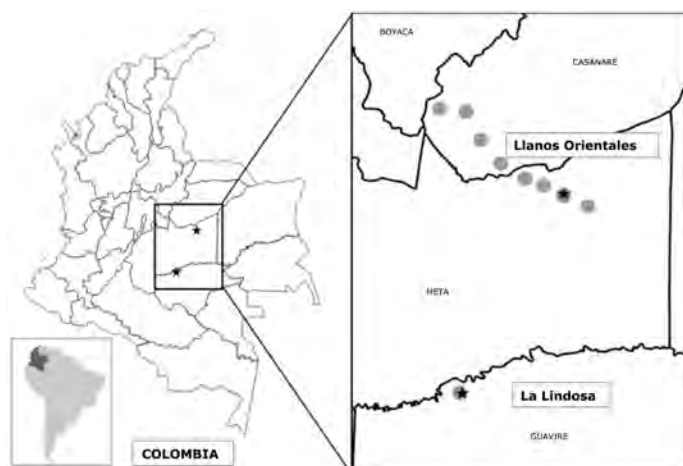
The scientific literature on the species in Colombia is very scarce and mostly out of date (Herskovitz 1957, Defler 1986). Records and data from scientific collections, virtual databases and surveys are available in its distribution range in South America, however they are scarce in

Colombia (DeMatteo & Loiselle 2008, Gil & Lobo 2012). Despite the widespread recorded decline in bush dog populations occurring throughout its range (DeMatteo *et al.* 2011) this species does not count with enough information to assess its extinction risk at the national level and it is not listed in any threat category in the Red Book of the Mammals of Colombia.

Using camera-trap data, we document in this short note the occurrence of the bush dog in Colombia in the Llanos Orientales in the Orinoco Basin (Meta Department) and Serranía de la Lindosa (Guaviare Department).

The first of the study areas was located in the Llanos Orientales (Department of Meta, hereafter 'Meta', and Department of Casanare, hereafter 'Casanare'; Fig. 1). The study area included as main ecosystem the Altillanura, with savannas or with flat or slightly wavy surfaces dominated by herbaceous and grasses plants (Romero 2004). The region's most representative habitats (savannas, gallery forests and moriche palms (*Mauritia flexuosa*); Trujillo *et al.* 2011), are currently threatened by changes

Figure 1. Study area. Eight sectors surveyed in Llanos orientales and one sector in La Lindosa (grey dots). Black stars shows *Speothos venaticus* detection.



to the landscape caused by the mechanization of agriculture, overpopulation, intensive hunting and the growth of the oil industry in Casanare and Meta, all factors that have led to an increase in the number of roads and vehicular traffic (Trujillo *et al.* 2011). Surveys were conducted in eight sectors (four in both Casanare and Meta), from the area of influence of the Llanos Orientales Pipeline, which runs for 327 kilometres perpendicular to the river Meta from Campo Rubiales (Meta) to Monterrey (Casanare) (Fig. 1). In each sector five camera traps were installed according to habitat type: three in riparian forest, including gallery forests and moriche palms and two in savannas. All camera traps were installed 30 cm above the ground along roads or trails and were separated by at least 500 m. Sample periods were carried out in the area of influence of the Llanos Orientales between July and November 2012 and then repeated between July and November 2013. The duration of each sampling period varied between 7 and 18 days.

The second study area, Serranía de la Lindosa (hereafter 'Lindosa', Department of Guaviare), is located near the capital of Guaviare, San José del Guaviare, in the transition zone between the Orinoco and the Amazon in the north of the Colombian Amazon (Cárdenas-López *et al.*, 2008). The most representative habitats are rock outcrops covered with a mosaic of rock-loving vegetation, dense natural forest, shrubs and bushes, fragmented natural forest (secondary), grassland and savannah, and opencast mines. The most serious impacts on the area are mining, which generates severe erosion, and agriculture. This latter activity is often accompanied by burning aimed at regenerating pasture for cattle, which in recent years has reached the highest rocky areas and transformed some of the region's most vulnerable ecosystems (Cárdenas-

López *et al.* 2008). In November and December 2012, 36 camera traps were installed 30 cm above the ground along roads and trails, separated by at least 1 km. We used attractants such as Obsession, sardines, and Catnip. The cameras were active for 45 days.

In Llanos Orientales two photo-captures of bush dogs (n=3 pictures and one video) were obtained from two different cameras in the same sector (Meta Department) in July 2013 (Table 1; Fig. 2), a total of 0.10 captures per 100 trap/nights. In Lindosa two photo-captures of bush dogs (n=4 pictures) were obtained from two different cameras in November 2012 (Table 1: fig. 2), a total of 0.18 captures per 100 trap/nights. The captures were obtained in gallery forest and secondary forest located in the margins of permanent or temporary water course. Other carnivore species detected both in Llanos Orientales and Lindosa localities were *Cerdocyon thous*, *Eira barbara*, *Leopardus pardalis* and *Puma concolor*. While in Lindosa, *Leopardus wiedii*, *Puma yagouaroundi* and *Panthera onca* were also detected.

Despite the limited data, our results confirm prior information regarding the species, namely, that the bush dog is primarily diurnal (Beisiegel & Zuercher 2005) (Table 1), moves or forages near water-courses and is a social species (Beisiegel & Ades 2002). Although it has been reported also occurring in open habitats (Defler 1986, Zuercher & Villalba 2002), photographs were only obtained from inside forests. Our results also confirm the fact that, in camera-trap studies in which bush dog data are obtained, the probability of detecting this species is low (Table 2). Population densities are one of the determinants of sampling success in camera-trap studies (Rowcliffe *et al.* 2008) and as such it is likely that very low population

Table 1. Camera-trap bush dog records obtained in this study. *Sunrise: 5:25 h / Sunset: 17:55 h.

Area	Meta	Meta	Lindosa	Lindosa
Date	15/07/2013	18/07/2013	16/11/2012	15/11/2012
Time (24h)*	7:10	7:03	4:56	6:53
Captures	1	1	1	1
NºPhotographs	3	1 Video	2	2
Hábitat	Gallery forests	Gallery forests	Secondary forest	Secondary forest
NºIndividuals	1	2	3	2
Coordinates	4° 00' 31" N	4° 00' 54" N	2° 28' 43.55" N	2° 28' 15.76" N
	71° 49' 08" W	71° 48' 56" W	72° 46' 3.76" W	72° 46' 3.76" W

densities explain the poor sampling success for bush dogs (Beisiegel & Ades 2002). Despite these low detection rates, insufficient to establish adequate density estimates, occasional records obtained by

camera-traps are providing important contributions to the knowledge of the distribution of the species throughout its range (Michalski 2010, Fusco-Costa & Ingberman 2012, Meyer *et al.* 2015). Due to the



Figure 2. Camera-trap photograph of Bush dogs *Speothos venaticus* in A) Serranía de la Lindosa (Guaviare department) and B) Llanos Orientales (Meta department).

Table 2. Effort (trap/night), Bush dogs captures and detection rates (captures per 100 trap / night) in this study and other publications where species were detected.

Data Origin	Effort	Captures	Detection rates	StudyArea Department (country)
Beisiegel 2009	4,818	1	0.02	Sao Paul (Brasil)
Michalski 2010	6,721	2	0.03	Mato Grosso (Brasil)
Fusco-Costa & Ingberman 2012	4,112	3	0.07	Paraná (Brasil)
Meyer <i>et al.</i> 2015	830-24,641	1 - 5	0.02 -0.12	Various locations (Panamá)
This study	1,920	2	0.10	Meta and Casanare (Colombia)
This study	1,109	2	0.18	Guaviare (Colombia).

low success obtained by traditional field techniques in detecting bush dog (DeMatteo & Loiselle 2008), camera-traps seems to be the most suitable tool for the study of the presence and distribution of the species.

Our data provide new information on the distribution of this canid in Colombia where existing information on its presence is extremely scarce. The study of the distribution and abundance of bush dogs in Colombia should be a priority in order to fully establish the threat level to this species and formulate an appropriate conservation strategy.

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