

Distribution Update

Expansion of the bush dog's elevational range in southern Colombia



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Abstract

The bush dog *Speothos venaticus* is a rare and infrequent species in camera trap studies. Its presence has been recorded mainly in lowlands below 1,500 metres above sea level (m a.s.l.) in diverse habitat types, from dense, continuous forests to fragmented and disturbed forests, in some cases close to waterways and human activity. Therefore, its presence alongside domestic dogs has become common, potentially increasing its risk of disease transmission. Since 2011, a community-based participatory wildlife monitoring process using camera traps has been developed in the department of Huila, Colombia, in the Guacharos-Puracé Conservation Corridor Regional Natural Park. A total of five independent records of bush dogs were obtained between April 2022 and April 2023 between 2,131 and 2,408m a.s.l. At least five different individuals were identified based on observations of colouration patterns, recording distances, and marking behaviour. These records represent an expansion of the species' altitudinal range throughout its distribution and includes Andean oak *Quercus humboldtii* forest ecosystems. The recorded area is located south of the Eastern Cordillera, which is considered the faunal exchange area between the Andean and Colombian Amazon regions. There is no verified information indicating that the species was previously present in this environment, and information from local communities seems to corroborate that the species is only now arriving. The records presented in this note indicate the use of dense mountain forests with high levels of human intervention and the presence of domestic dogs, which raises the need for the corresponding territorial environmental authority to define monitoring, research, and conservation strategies.

Introduction

The bush dog *Speothos venaticus* (Lund 1842), a species unique to its genus and globally listed as Near Threatened by the IUCN (DeMatteo et al. 2011), is one of the rarest and least known small South American Canids (4-7kg). It is a robust animal, with short legs, a short tail, small, round ears, and a short face and skull (Berta 1984). It has short brown fur, with a reddish hue on its sides, back, and tail, whereas the head and neck are yellow (Berta 1984; Figure 1). The bush dog is hypercarnivorous (Damasceno et al. 2013) and lives in groups consisting of a mating pair and their extended family. Their dentition is highly modified; Zuercher et al. (2005) point out that the carnassial molars are similar to those found in African wild dogs *Lycaon*

pictus and dholes (Asiatic wild dogs, *Cuon alpinus*), both hypercarnivorous species that hunt in groups. Damasceno et al. (2013) also show that in these three species, both the bite force quotient and the brain volume quotient values were the highest for all canids, precisely due to several acquired adaptations for hypercarnivory (Ruiz et al. 2022). The bush dog is distributed from northern Costa Rica (de la Rosa and Nocke 2000) to northeastern and eastern Paraguay (Zuercher et al. 2002, 2005, DeMatteo et al. 2004, Smith 2022) and northeast Argentina (DeMatteo et al. 2014), with isolated populations to the west of the Andes in Ecuador (Tirira 2001) and Colombia (Mosquera-Guerra et al. 2019).

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The bush dog is uncommon in scientific collections and is rarely recorded on camera traps (Michalski 2010, Gil and Lobo 2012, Azevedo et al. 2016, Rodríguez-Castellanos et al. 2017, Mosquera-Guerra et al. 2019, Hallett et al. 2021, Soto-Werschitz et al. 2003). It is a habitat generalist and is typically found in lowland habitats where it tends to be present near water sources (Beisiegel and Zuercher 2005, Michalski 2010), with available prey populations (Mosquera-Guerra et al. 2019). The bush dog hunts cooperatively, with their favoured prey including lowland pacas *Cuniculus paca*, agoutis *Dasyprocta* sp., mountain rats *Oryzomys* sp. and *Proechimys* sp., common tapeti *Sylvilagus brasiliensis*, opossums *Didelphis* spp., and nine-banded armadillos *Dasyus novemcinctus* (Deutsch 1983, Van Humbeck and Pérez 1998, Zuercher and Villalba 2002, Zuercher et al. 2005, Lima et al. 2012), and it has been known to use the burrows of these species as dens (Lima et al. 2012, Gil and Lobo 2012). Although field data are scarce, there are reports of bush dogs hunting in groups of 5–12 individuals, which allows them to take larger prey (Strahl et al. 1992, Wallace et al. 2002, Beisiegel and Zuercher 2005, Ruiz et al. 2022, Barinova et al. 2023). Urine is essential for communication in bush dogs (DeMatteo et al. 2004, Barinova et al. 2023), and females mark their territory on vertical surfaces with urine by standing on their forelegs and gently dragging their anogenital region against the vertical surface (Biben 1982, Kleiman 1966, Beisiegel and Zuercher 2005; see Supplementary Material [Video 1](#)).

The bush dog inhabits lowland forests (below 1,500 metres above sea level [m a.s.l.]; DeMatteo et al. 2011), including primary forests and large forest fragments (Michalski and Peres 2005, Michalski 2010), riparian forests (Defler 1986), semi-temperate broadleaf forests, and seasonally flooded forests (Aquino and Puertas 1997). Individual bush dogs have been recorded in the Cerrado of Brazil and Paraguay (Silveira et al. 1998, Zuercher and Villalba 2002). In riverine areas and at the edges of the pampas (i.e., humid savannahs; Strahl et al. 1992, Emmons and Ferr 1997), as well as occasional presence in secondary forests, rangelands, and fragmented rangelands of the Cerrado (Zuercher et al. 2005, Lima et al. 2012, Hallett et al. 2021). The species seems to prefer environments away from human activities, although in some cases, it has been observed several kilometres from forest habitat (DeMatteo et al. 2011).

While DeMatteo and Loiselle (2008) reassessed the distribution and status of bush dogs across its widespread range, population estimates and demographics are poorly understood. Research techniques such as telemetry studies (Lima et al. 2012) and detection dogs (DeMatteo et al. 2009, 2014) have provided important information on bush dogs, but more research is needed to better understand the species. Knowledge of its feeding habits is based primarily on anecdotal information and limited studies (Zuercher et al. 2002, Lima et al. 2012), and seasonal or geographic variation needs to be examined. Its habitat associations are not fully understood, and although the species was previously thought to be forest-dependent, current information indicates that it can also be found in open or fragmented habitats (DeMatteo and Loiselle 2008, Lima et al. 2012, Michalski 2010). Similarly, while their behaviour and social structure have been studied in captivity (Portón et al. 1987, Macdonald 1996, Beisiegel and Ades 2002, Barinova et al. 2023), there is currently only limited confirmation in the wild (Lima et al. 2012) and additional information is needed, for example, on interspecific interactions with sympatric carnivores (Zuercher et al. 2004).

Furthermore, the current and historical impact of diseases that may affect their survival is unclear, which is especially relevant considering their increasing overlap with domestic dogs *Canis lupus familiaris* in fragmented and human-occupied areas (DeMatteo et al. 2011, Lima et al. 2012, Gutiérrez-Cruz et al. 2024). The need for these studies is emphasised by the new

data reported in this study, given that the species is present in the highlands of Andean Forest ecosystems, where at least three other wild canids exist, as well as by the increasing presence of domestic dogs in wild areas in Colombia.

In Colombia, the species-specific habitats reported correspond to primary ecosystems below 1,650m a.s.l of subtropical/dry tropical forest, subtropical/tropical humid lowland forests, subtropical/tropical swamp forest, and subtropical/tropical humid mountain forest (DeMatteo et al. 2011). Its presence is frequently recorded in ecosystems of dry or humid savannah, as well as in formations of subtropical/dry tropical scrub and sometimes in artificial grasslands. However, it had never been observed in forests of the Colombian Andean region.



Figure 1. Three bush dog individuals recorded on 22 April 2022 at 09:42:17 at 2,268 metres above sea level in Bruselas Village (camera station #11: 1°43'03.80" N; 76°16'07.58" W) in the municipality of Pitalito by the Porvenir Tierra y Semillas Community Monitoring Group.

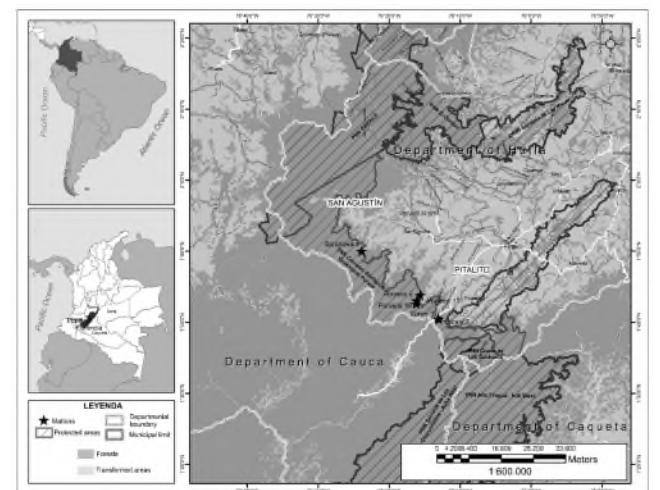


Figure 2. The recorded distribution of the five locations of bush dog camera trap sightings (black stars) in the Guacharos-Puracé Conservation Corridor Regional National Park, in the municipalities of Pitalito and San Agustín, in the department of Huila, Colombia.

Table 1. Registered locations for the bush dog individuals recorded in the Guácharos-Puracé Conservation Corridor RNP, southern Huila province, Colombia.

Record No.	Municipality	Rural District	Station name	Latitude (N)	Longitude (W)	Elevation (m a.s.l)	Registry No.	Date (d-m-y)	Time (h:m:s)
1*	Pitalito	Porvenir	Porvenir 11	1°43'03.80"	76°16'07.58"	2.268	1200006	24-Apr-2022	08:30:53
2			Porvenir 10	1°42'37.11"	76°16'12.05"	2.135	4220008	22-Apr-2022	09:42:11
3			Porvenir 5	1°43'50.71"	76°15'37.27"	2.363	5010006	1-May-2022	06:58:07
				1°43'50.71"	76°15'37.27"	2.363	5010007	1-May-2022	06:59:16
4		El Cedro	Conny 1	1°40'32.5"	76°13'06.4"	2.335	8160032	16-Aug-2022	06:56:25
			Conny 2	1°40'26.0"	76°13'02.3"	2.369	8160033	16-Aug-2022	07:01:34
5	San Agustín	El Oso	Serankwa 4	1°50'0.77"	76°23'53.18"	2.408	DCIM0077	18-Apr-2023	07:08:47

* The date of the video has been corrected, with the video value (20-Jan-2018) incorrect due to camera formatting problems.

The five new records of bush dogs presented in this study represent a significant ecological extension in the species' elevational distribution into Andean forests above 2,100m a.s.l (Table 1). These records were obtained within the framework of the biodiversity community monitoring project in the Guácharos-Puracé Conservation Corridor Regional Natural Park (G-P Conservation Corridor RNP; Rodríguez et al. 2023) in the Cinturón Andino Biosphere Reserve, which covers great extensions of Andean oak forest at altitudes of 2,000m a.s.l, by 1) the Porvenir Tierra y Semillas Community Monitoring Group (CMG) in the municipality of Pitalito, 2) the Environmental and Risk Management Office (OAGR) in the municipality of Pitalito, and 3) the Serankwa CMG in the municipality of San Agustín, in the south of the Huila department.

The first record was noted in three videos (see Supplementary Material [Video 1](#) and [Video 2](#)) on 22 April 2022, 24 April 2022, and 1 May 2022, as well as one photo on 22 April 2022 (Figure 1), in the rural district of Porvenir and municipality of Pitalito, by the Porvenir Tierra y Semillas CMG, which showed the presence of three distinct individuals, presumably a male and two females, one of which seems to be a juvenile showing species-specific urine-marking behaviour (Figure 2). All three records occurred during the early morning hours (06:58–09:42) and ranged between 2,135–2,363m a.s.l. (Table 1). The second set of records were obtained on 16 August 2022 in the rural district of El Cedro and municipality of Pitalito at a camera trap station by the OAGR, which revealed the presence of two individuals. Both records occurred during the early morning hours (06:56 and 07:01) and at elevations >2,300m a.s.l. (Table 1). The third record occurred on 18 April 2023 in the rural district of El Oso and municipality of San Agustín at a camera trap station in the Civil Society Natural Reserve El Paraíso del Turpial by the Serankwa CMG, which showed two individuals (Figure 2). These individuals are presumed different from those registered on 22 April 2022, given the proximity of dates and large distance between the two locations (i.e., approximately 27km in straight-line distance; Figure 2). The videos were recorded in the early morning hours (07:08) and at the highest recorded elevation (2,408m a.s.l.; Table 1).

Of the 65 previously reported records of bush dogs recorded for Colombia (<https://www.gbif.org/dataset>; <https://ipt.biodiversidad.co>; see Table 2), 69.84% correspond to the Amazon region, with a minimum elevation of 75m a.s.l., a maximum of 2,536m a.s.l., and an average of 428m a.s.l. The highest records correspond to data reported for the department of Putumayo by community monitoring groups, obtained from 2020 onwards, at elevations and habitats similar to those reported in this note, and indicate a specimen in the collection of the Barcelona Museum of Natural Sciences, MCNB-Cord (MZB 2003-1742; Quesada and Agulló 2025), obtained in the municipality of Sibundoy, Putumayo, 90km southwest of this study. The records reported in this note are located between 2,135 and 2,408m a.s.l. (Table 1) and are 908m a.s.l. above the upper elevation limit reported (DeMatteo et al. 2011; <https://www.canids.org/amazonian-canidsworking-group>) which, added to the recent information from Putumayo, demonstrates an increase in the known altitude range for bush dogs in the Colombian Andean ecosystem, as well as the lack of information on its presence in these forests at this altitude and the need for an update of the general distribution of the species.

The record of this species in the Andean forests of the G-P Conservation Corridor RNP demonstrates the importance of the Andean-Amazonian corridor for national biodiversity (Barrera et al. 2007, CI 2023). However, the confirmed presence of bush dogs in the highest altitude forests of Colombia (see Figure 2) indicates that further research is needed to determine whether its presence has gone unnoticed due to the difficulty in developing biodiversity studies in the region because of the conditions of armed conflict in the country (Clerice et al. 2019), or its altitudinal expansion may be a consequence of deforestation and climate change throughout the Amazon region, especially in the bordering departments of Cauca, Caquetá, and Putumayo (Murillo-Sandoval et al. 2022). In any case, it is necessary to design a monitoring strategy focused on the species, which allows us to understand its distribution and the use of Andean oak forests in the G-P Conservation Corridor RNP.

While the bush dog is not formally considered under any threat in Colombia (Minambiente 2024), there is no doubt that it faces the same threats as the species does in other parts of its range, including ongoing habitat loss and fragmentation, a decrease in prey due to illegal hunting, predation by domestic dogs, and disease risks related to other canids and domestic animals (DeMatteo et al. 2011). Within the Andean forests of the G-P Conservation Corridor RNP, numerous potential prey species for bush dogs are found,

including both Colombian Paca species *Cuniculus paca* and *C. taczanowskii*, deer *Mazama* sp., multiple rodents (e.g., Central American agouti *Dasyprocta punctata*, wild mice *Cricetidae* sp.), cottontail rabbits *Sylvilagus* sp., and long-nosed armadillos *Dasyurus* sp., as well as at least 23 other mammal species and 19 bird species (Rodríguez et al. 2022).

The presence of this rare species in the Andean forests of the municipalities of Pitalito and San Agustín generates concerns regarding its conservation, which must be assumed by the territorial environmental authority, with the support of regional universities and the participation of the rural population organised into Community Monitoring Groups. These groups are fundamental to the recognition and appropriation of regional biodiversity, which can be demonstrated by the fact that this study could not have been possible without the voluntary work of community monitors.

Table 2. Distribution of bush dogs by department of records for Colombia.

Department	No. Reords	Max elevation	Min. elevation	Average	No data elevation
Amazonas	1	80			
Antioquia	11	1,589	68	670	6
Bolivar	1	17			1
Caquetá	2	239	210		
Cundinamarca	1	600			
Guanía	1	80			
Guaviare	3	209	205	207	
Huila	5	2,408	2,135	2,320	2
La Guajira	1	1,653*			
Meta	20	1,653	153	407	
Putumayo	6	2,536**	334	1,357	
Santander	1				1
Vichada	10	188	75	118	1
Without location	2				

* Indicates maximum altitude at Sierra Nevada de Santa Marta

** Indicates maximum altitude associated with a specimen in collection. Museo de Ciències Naturals de Barcelona: MCNB-Cord (Quesada et al. 2025).

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