

Short Communication

The bush dog *Speothos venaticus* and short-eared dog *Atelocynus microtis* in a fragmented landscape in southern Amazonia

FERNANDA MICHALSKI

Abstract The bush dog *Speothos venaticus* and the short-eared dog *Atelocynus microtis* are categorized as Near Threatened on the IUCN Red List. I document the occurrence of these two little known canids in a fragmented landscape in southern Amazonia (around Alta Floresta, Mato Grosso state, Brazil) using interviews and two extensive camera-trapping surveys. From a total of 144 interviews conducted during 2001–2002 in forest fragments and continuous forest sites, bush and short-eared dogs were confirmed in only eight (5.6%) and 14 (9.7%) forest sites, respectively. Two camera-trapping surveys, conducted in 2003–2004 and 2007–2008, with a total of 6,721 camera-trap days, recorded two photographs of bush dogs and seven of short-eared dogs, in three continuous forest sites. On the basis of the large sampling effort it appears that these two elusive species occur at low densities in the study region. The continued presence of these species in an agricultural frontier with high deforestation rates makes this information of relevance for long-term conservation initiatives in this region and in other Neotropical agricultural frontiers.

Keywords Amazon, *Atelocynus microtis*, Brazil, bush dog, distribution, Mato Grosso, short-eared dog, *Speothos venaticus*

The bush dog *Speothos venaticus* and the short-eared dog *Atelocynus microtis* are categorized as Near Threatened on the IUCN Red List (IUCN, 2009), in particular because of habitat loss. Data on the distribution and ecology of the bush dog are scarce (Eisenberg, 1989; Redford & Eisenberg, 1992; Silveira et al., 1998; Michalski & Peres, 2005; DeMatteo & Loiselle, 2008; Oliveira, 2009) and mostly based on opportunistic sightings (Peres, 1991; Strahl et al., 1992; Silveira et al., 1998; Barnett et al., 2001). Even less data are available on the distribution and status of the short-eared dog (Peres, 1991; Eisenberg & Redford, 1999; Koester et al., 2008; Leite & Williams, 2008).

FERNANDA MICHALSKI Department of Ecology, Bioscience Institute, University of São Paulo, Rua do Matão 321, Travessa 14, São Paulo, SP 05508-900, Brazil, and Instituto Pró-Carnívoros, C.P. 10, Atibaia, SP 12940-970, Brazil. E-mail fmichalski@procarnivoros.org.br

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The southern Brazilian Amazon has been subjected to large-scale deforestation (INPE, 2008) that has produced a fragmented landscape comprising forest remnants of varying size, shape and connectivity (Michalski et al., 2008). These forest fragments are experiencing multiple disturbance regimes (Michalski & Peres, 2005). Here, I document the occurrence of bush and short-eared dogs in the Alta Floresta region, northern Mato Grosso state, in the southern Brazilian Amazon, based on interview data and camera trapping.

During June–September 2001 and May–July 2002 I obtained data on occupancy of carnivores using interviews with local landowners in 129 forest fragments and 15 sites in continuous forest in a 4,648-km² area (see Michalski & Peres, 2005, for details; Fig. 1). I then conducted two camera trap surveys in a 2,850 km² area of the same region. In the first survey (June 2003–December 2004, total trap days = 3,086) CamTrakker phototraps (Camtrakker, Watkinsville, USA) were distributed across three habitat types on a hexagonal grid (c. 500 m apart): forest fragments < 1,000 ha (n = 18, 1,599 trap days), forest fragments > 1,000 ha (n = 3, 916 trap days) and continuous forest (n = 2, 571 trap days). In the second survey (October 2007–December 2008, total trap days = 3,635) Tigrinus phototraps (Tigrinus, Santa Catarina, Brazil) were used in four habitat types: continuous forest (n = 4, 1,028 trap days), forest fragments > 1,000 ha (n = 20, 1,102 trap days), riparian corridors (n = 12, 660 trap days) and pasture (n = 12, 845 trap days). The distribution of camera traps in the latter three habitats followed perennial streams (c. 500 m apart). In both surveys cameras were placed 30–40 cm above ground, deployed for 30 days, and checked every 3–4 days to renew the scent lure (Hawbaker's Wild Cat Lure 2; Minnesota Trapline Products, Pennock, USA), batteries and film as necessary. Consecutive photos of the same species were defined as independent occurrences if individuals could be unambiguously distinguished or if the interval between photographs was > 30 minutes.

In the interviews bush and short-eared dogs were reported less frequently than all other carnivores (Michalski & Peres, 2005). Bush dogs were reported in only two forest fragments and six continuous forest sites, and short-eared dogs in only four forest fragments and 10 continuous forest sites (Michalski & Peres, 2005).

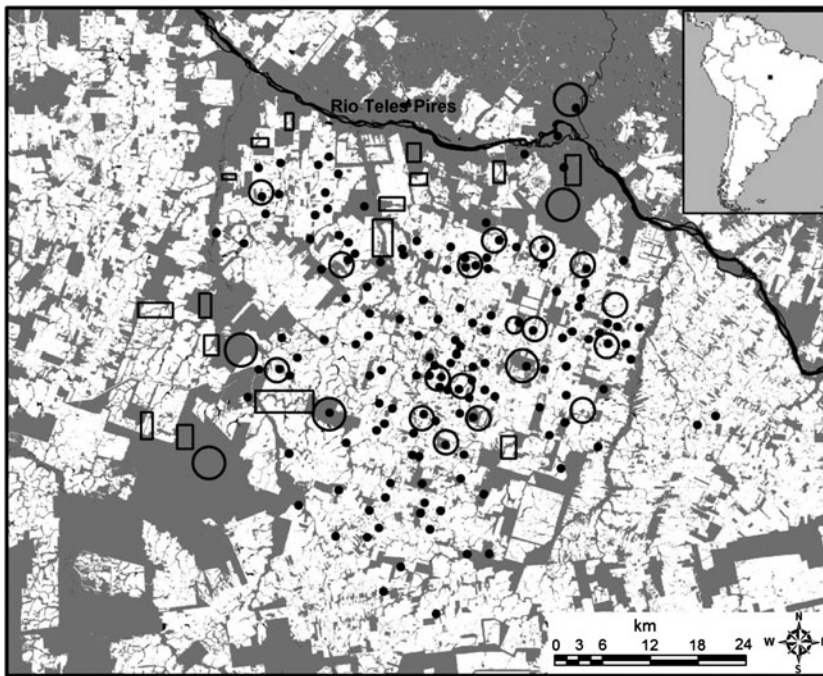


FIG. 1 The study area in Alta Floresta, northern Mato Grosso state, Brazil (see inset for location), showing the 144 forest patches and continuous forest sites where interviews with landowners were conducted (solid circles) and the location of the two camera trap surveys in 2003–2004 (open circles) and 2007–2008 (open rectangles). Grey and white areas represent forest and non-forest cover, respectively.

I obtained 1,167 independent photographs in 3,086 trap days during 2003–2004 and 1,845 independent photographs in 3,635 trap days during 2007–2008. From this total I recorded bush dogs in two photographs and short-eared dogs in seven photographs, in the 2007–2008 survey only (Table 1). These photographs were obtained in three continuous forest sites. The two photographs of bush dogs were from abandoned logging access tracks (5 and 8 years after selective logging), six photographs of the short-eared dogs were obtained along perennial rivers within continuous forest sites, and one photograph was obtained in a continuous terra firme forest. All photographs detected single individuals apart from one of bush dog that recorded two adults and one juvenile (K.E. DeMatteo, pers. comm.). Photographs of short-eared dogs were confirmed by carnivore experts with > 10 years of experience working with these canids (M.R.P. Leite-Pitman, pers. comm.; T.G. de Oliveira, pers. comm.). Landowners of two of the three continuous forest sites where these canids were photographed reported the presence of the two species in 2001–2002. Based on the number of independent photographs obtained and the sampling effort in all habitat types, one photograph required 3,361 trap days for the bush dog and 960 trap days for the short-eared dog. Considering only camera-trapping in forest fragments > 1,000 ha and continuous forest sites, these numbers decrease to 1,065 and 304 trap days per photograph for bush and short-eared dogs, respectively.

Despite its broad distribution and occurrence in a variety of habitats (Silveira et al., 1998; DeMatteo & Loiselle, 2008; Oliveira, 2009) the bush dog seems to be naturally rare throughout its range. Previous data based on tracks recorded the minimum home range for a group to be c.

1,600 ha, with a density estimate of c. 0.04 km^{-2} (Beisiegel & Ades, 2004; Zuercher et al., 2008). The record of only two photographs of bush dogs (three individuals in one and one individual in another) in an area of $2,850 \text{ km}^2$ gives an estimate of 0.001 km^{-2} for the study area. Although the interview data reported the occurrence of bush dogs in 1.6% of the fragments and 40% of the continuous forests surveyed, I never recorded this species by camera traps in pasture, in riparian forests or in forest fragments < 1,000 ha. This contrasts with the finding that 20% of historical bush dog locations were associated with fragmented or altered habitat (DeMatteo & Loiselle, 2008).

Records of short-eared dog show a discontinuous distribution across its range (Emmons & Feer, 1997) and the species is characterized as rare and uncommon (Leite & Williams, 2008). Recent studies (M.R.P. Leite-Pitman, unpubl. data) followed five individuals of this species in Cocha Cashu, Manu National Park, Peru, and estimated density to be 0.5 km^{-2} (Leite & Williams, 2008). Although recorded in seven independent photographs in Alta Floresta, all were obtained in a single continuous forest area. This may confirm the discontinuous distribution described by Emmons & Feer (1997). This species was more frequently reported in forest fragments (3.1%) and continuous forests (66.7%) in interviews, which may suggest that a greater effort is required to record the presence of short-eared dogs in the study area. Another camera-trapping study recorded this species only twice in 905 trap days in 220,000 ha in Rondônia state, Brazil (Koester et al., 2008).

With intensive sampling across several years and seasons, my results highlight the low density of bush and short-eared dogs in a fragmented region in southern

TABLE 1 Summary of photographs obtained during camera-trapping in 2003–2004 and 2007–2008 for bush dog *Speothos venaticus* and short-eared dog *Atelocynus microtis* in the Alta Floresta region, northern Mato Grosso, Brazil (Fig. 1).

| | No. of photos (day, night) ¹ | No. of consecutive photos (interval in minutes) ² | No. of camera stations (mean km apart, SD) ³ | No. of sites with confirmed occurrence |
|---------------------|--|--|---|---|
| <i>S. venaticus</i> | 2 (2, 0) | 0 | 2 (48.6) | 2 |
| <i>A. microtis</i> | 8 (7, 1) | 1 (3) | 3 (1.1, 0.53) | 1 |

¹Daytime photographs were considered those between 05.00 and 18.00

²Obtained in the same day at the same camera-trap station within a 30-minute interval

³Number and distance between camera-trap stations

Amazonia. This is also supported by the interview data, which demonstrated < 40% probability of occurrence for both species in forest areas < 10,000 ha (Michalski & Peres, 2005). Although camera-trapping can produce unpredictable results for rare species, the fact that I surveyed a variety of habitat types and recorded bush and short-eared dogs in only 1.6 and 3.1%, respectively, of forest fragments (through interviews) and did not record either species at camera traps in sites other than continuous forest indicates that these species may avoid disturbed areas or at least use such areas less frequently compared to undisturbed areas. An evaluation of the distribution of bush dogs in northern Brazil also reported that the majority of records of this species are from undisturbed lowland terra firme forest (Oliveira, 2009). My data provide information about these two elusive canids in southern Amazonia and this information is of particular importance for long-term conservation initiatives in this region and in other Neotropical agricultural frontiers.

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Biographical sketch

FERNANDA MICHALSKI has a particular interest in conservation biology and the ecological consequences of habitat fragmentation. For the past 8 years she has been developing and coordinating research projects in the Brazilian Amazon, exploring faunal and floral responses to anthropogenic perturbations. She is now studying the responses of mammals to different patterns of deforestation in a fragmented landscape.