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Field Report

Human threats to hoary and crab-eating foxes in central Brazil

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Abstract

We report threats to hoary *Lycalopex vetulus* and crab-eating foxes *Cerdocyon thous* at cattle farms in the southeast of Goiás State, Brazil, and on a federal road at Minas Gerais state, including the possible first documented crab-eating fox intentionally poisoned in Brazil. Greater awareness and understanding of the threats faced by Brazilian carnivores will help with conservation plans for these species in the future.

Introduction

The hoary fox *Lycalopex vetulus* is a small canid, endemic of *cerrado* vegetation in Brazil (Dalponte, 1995; Eisenberg and Redford, 1999), and considered by IUCN/Canid Specialist Group one of the seven less studied canids of the world. Although originally found in open areas of *cerrado*, apparently it also adapts to insect-rich livestock pastures and agricultural areas (Dalponte and Courtenay, 2004). Its diet consists mainly of termites, but other insects, fruits, birds, and small rodents are also consumed (Dalponte 1995; Juarez and Marinho-

Filho, 2002; Dalponte, 2003; Jácomo et al., 2004; Courtenay et al., 2006; Dalponte, 2009). The crab-eating fox is considered one of the most versatile of canids due its ability to use a variety of habitat types (Berta 1982, Eisenberg and Redford 1999, Courtenay and Maffei 2004) and to exploit a great number of different food items (Montgomery and Lubin 1978, Juarez and Marinho-Filho 2002, Facure et al. 2003, Courtenay and Maffei 2004, Jácomo et al. 2004), including anthropic ones. Despite its wide distribution, few data are available on the species' population dynamics and the threats it faces in wild and human-inhabited areas. The same gap of knowledge exists for the hoary fox, however both species are listed as Least Concern by the IUCN Red List (Courtenay and Maffei 2008, Dalponte and Courtenay 2008), and listed in Appendix II of CITES.

All range countries have some specific protective legislation (Courtenay and Maffei 2008), and in Brazil, the hunting of any wildlife is illegal (MMA 2008, Courtenay and Maffei 2008). However, hoary foxes and crab-eating foxes are known to be persecuted and killed by farmers for preying on domestic fowl (Courtenay and Maffei 2004, Dalponte and Courtenay, 2004). Road traffic accidents and killing by domestic dogs may also have a significant impact on the species.

The aim of this paper is to investigate the threats facing these canids in central Brazil, presenting data on poisoning, killing by domestic dogs and road traffic accidents. Recommendations are made to facilitate their future conservation.

Methods

The data presented is part of an ongoing project on hoary fox and crab-eating fox ecology and conservation being carried out on cattle farms (18°22'S, 48°07'W) in the southeast of Goiás State, and at the Triângulo Mineiro region, Minas Gerais State, Brazil (Figure 1).

The farms are located in the *cerrado* (savannah biome) and comprise the Limoeiro Region, which presents a total area of more than 15,000ha, of which c. 85% is covered by pasture and the other 15% by natural vegetation (gallery forest and *cerrado sensu stricto*). Since April 2008 the project team has captured 18 hoary foxes and 19 crab-eating foxes, collected blood and parasite samples and fitted VHF transmitters.

Data on road-killed mammals were collected through monitoring of a 50km stretch of the Brazilian Federal road BR-050, from 25 January to 28 December 2005, between the study area (Limoeiro region) and the municipality of Araguari, Minas Gerais State. The road was checked for carcasses one to three times per month, totaling 14 surveys. When a carcass was found, the species and location was identified. We also present preliminary data of road kills at dirt roads of the study site.

Results

Poisoning

Crab-eating fox # 0107 was captured in May 2008 and fitted with a VHF transmitter (model 1950, Advanced Telemetry System Inc.), with activity/mortality sensors. Clinical evaluation during capture found #0107 to be in good health and body condition with no signs of infection or disease. The fox was being monitored twice a week and in early June 2008 was observed foraging normally and appeared robust and healthy. Two months later, it was found dead in the edge of a forest fragment.

From the state of decomposition it was estimated that it had died at the beginning of July. There were no signs of predation by wild carnivores nor by domestic dogs. Under its body there were dead flies (Diptera *sp.*), and a dead vulture *Coragyps atratus* was found close by, with no apparent signs of predation. Nearby there was a plastic bag filled with the remains of meat and dead flies. It was not possible to carry out any chemical analysis on the carcass due to the extent of decomposition.

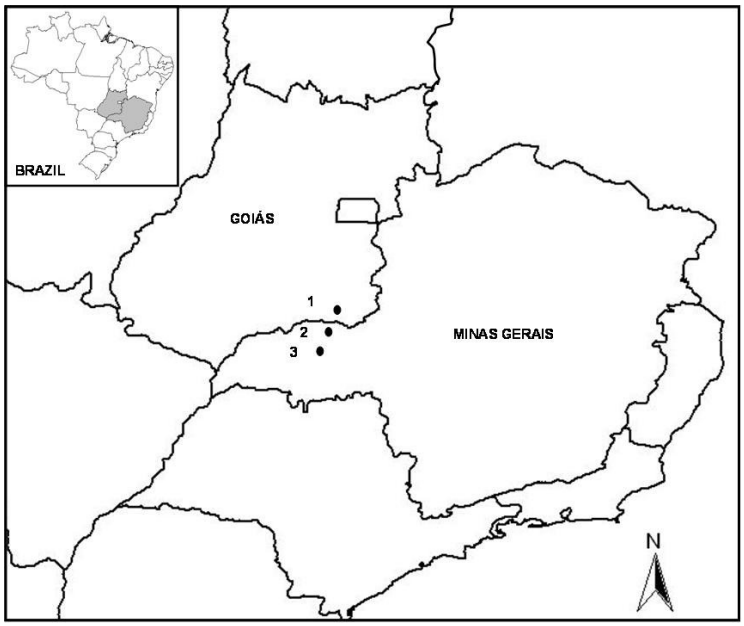

Figure 1. Study area of the Hoary fox and Crab-eating fox Ecology and Conservation Project. Limoeiro region, southeast Goiás state, municipality of Cumari, and Araguari, Minas Gerais state, Brazil. 1) Cumari, 2) Araguari, and 3) Uberlândia. Map by F. C. Azevedo.

Killing by domestic dogs

Six encounters between foxes and domestic dogs have been recorded since April 2008. On three occasions solitary hoary foxes were chased by domestic dogs. Two escaped into armadillo holes, while one fox attempting to enter a hole was killed by a dog. Similarly, on three occasions crab-eating foxes foraging/resting in pastures were chased by domestic dogs. On two occasions foxes escaped from the dogs by entering into a cattle grid. A third crab-eating fox escaped running away to the bush, after being chased for 100 metres.

Road traffic accidents

Road-kills of 11 species of medium and large mammals were recorded in 700km of surveys. Although only one male hoary fox has been registered, the crab-eating fox was the most common casualty (n = 4). Three of the crab-eating foxes and the hoary fox were found during the dry season.

Three hoary foxes and one crab-eating fox were road killed at dirt roads that cross the study area in the period of one year; two were female collared hoary foxes (Figure 2). All foxes were found during the dry season.

Figure 2. Monitored hoary fox road-killed at a dirt road, Limoeiro region, Cumari, Goiás state, Brazil. Photo by F. G. Lemos.

Discussion

Our observations confirm that hoary and crab-eating foxes face several human-related threats in central Brazil. Although the crab-eating fox is considered common throughout much of its range, such threats should be quantified in order to understand how popu-

lations might be affected. The same is true of the lesser-known hoary fox.

In countries where it is legal, the use of poison is a very common and traditional method for controlling carnivores (Sillero-Zubiri and Switzer 2004). Although we had no means of carrying out chemical analysis on the dead fox to confirm poisoning, during an interview with the owner of the area # 0107 used as its home-range, he admitted using poison regularly to kill predators in his area. Despite our team efforts to offer assistance to farmers regarding predation problems, poisoning seems to be a common technique used by Limoeiro farmers to eliminate predators (Lemos and Azevedo, pers. comm.).

According to a study on fox diet carried out at the study site (Lemos et al in press), domestic fowl were never found in hoary fox scats, and in low numbers in crab-eating fox scats. However, ranchers are indiscriminately killing possible predators of domestic animals based on suspicion rather than fact. The use of poison in this way may affect other levels of the food chain (Sillero-Zubiri and Switzer 2004), such as other sympatric canids e.g. the threatened maned wolf *Chrysocyon brachyurus,* other carnivores, and scavengers such as vultures.

Killing or removing the problem animal is not the most effective way of solving human-predator conflicts (Rabinowitz 1995, Pitman et al. 2002, Sillero-Zubiri and Switzer 2004). Prevention of attacks is a better solution, but this relies on farmers to change their husbandry practices (Oli et al. 1999, Conforti 2006). Better education and greater awareness may offer a more long-term solution to the problem (Bejerke et al. 1998).

Regarding interactions with domestic dogs, Brady (1979) also reported domestic dogs chasing crab-eating foxes. These dogs, most of which are not vaccinated, carry the risk of transmitting epidemic diseases (some fatal).

Road traffic accidents have a strong negative impact on foxes, and should be better quantified in other regions where the species occur. Another study being carried out in Goiás state also shows that the most frequently killed species on roads and railways are crab-eating foxes, while hoary foxes are killed more at dirt roads (Lemos and Azevedo, pers. comm.). Data also shows that the number of road kills is higher during the dry season; however more long-term studies are needed to confirm this.

Most roads in Brazil, with the exception of a few private administration ones, currently do not offer any means of avoiding such accidents such as faunal corridors or road signs in regions with high concentrations of wildlife. We believe more work should be carried out in order to produce more quantitative data which may be provided to stakeholders when creating new roads or improving old ones.

In Brazil, there is a lack of basic knowledge of many carnivores, mainly the smaller species (Morato et al. 2004) as the hoary fox. Data on the threats Brazilian canids face are mostly speculative and brief (e.g. Sillero-Zubiri et al. 2004, , Sillero-Zubiri 2009); however such data should be better quantified since it may be important in the future to establish action plans, and conservation and management priorities. Studies in human-inhabited areas remain scarce (e.g. Dalponte and Lima 1999, Juarez and Marinho-Filho 2002, Lemos et al. in press), although agriculture and farming occupy a great proportion of the available habitat for native canids in this country.

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References

Bejerke T., Reitan O. and Kellert S. R. 1998.

Attitudes toward wolves in southeastern Norway. Society and Natural Resources 11: 169-178.

Berta, A. 1982. *Cerdocyon thous. Mammalian Species* 186:1-4.

Brady, C. A. 1979. Observation on the behaviour and ecology of the crab-eating fox (*Cerdocyon thous*). In: J. F. Eisenberg (ed.), *Vertebrate ecology in the northern neotropics*. Smithsonian Institution Press, Washington D.C., USA.

Conforti V. A. 2006. Local perceptions toward large carnivores in livestock raising areas. In: R. G. Morato, F. H. G. Rodrigues, E. Eizirik, P. R. Mangini., F. C. C. de Azevedo and J. Marinho-Filho (eds.), *J Manejo e Conservaçcao de Carnívoros Neotropicais*. IBAMA, Brazil. Pp. 183-191.

Courtenay, O. and Maffei, L. 2004. Crab-eating fox *Cerdocyon thous* (Linnaeus, 1776). Pp. 32-38. In: C. Sillero-Zubiri, M. Hoffmann and D.W. Macdonald (eds.). *Canids: Foxes, Wolves, Jackals and Dogs*. IUCN/SSC Canid Specialist Group. Gland, Switzerland and Cambridge, UK.

Courtenay, O. and Maffei, L. 2008. *Cerdocyon thous*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. <www.iucnredlist.org>. Downloaded on **17 June 2010**.

Dalponte, J. C. (1995). The hoary fox in Brazil. Canid News, 3, 23-24.

Dalponte, J. C. (2009). *Lycalopex vetulus* (Carnivore; Canidae). Mammalian Species, 847, 1-7.

Dalponte, J. C. and Lima, E. S. 1999. Disponibilidade de frutos e a dieta de *Pseudalopex vetulus* (Carnivora - Canidae) em um cerrado de Mato Grosso. *Revista Brasileira de Botânica* 2:325-332.

Dalponte, J. C. and Courtenay, O. (2004). Hoary fox *Lycalopex vetulus*. In C. Sillero-Zubiri, M. Hoffmann & D.W. Macdonald (eds.), Canids: foxes, wolves, jackals and dogs (p. 72-76). Switzerland and Cambridge, UK, IUCN/SSC Canid Specialist Group Press.

Dalponte, J. C. and Courtenay, O. 2008. *Pseudalopex vetulus*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.1. www.iucnredlist.org>. Downloaded on **14 September 2010**.

Eisenberg, J. F. and Redford, K. H. 1999. *Mammals of the Neotropics, the Central Neotropics*. The University of Chicago Press, Chicago, USA and London, UK.

Facure, K. G.; Giaretta, A. A. and Monteiro-Filho, E. L. A. 2003. Food habits of the crab-eating-fox, *Cerdocyon thous*, in an altitudinal forest of the Mantiqueira Range, Southeastern Brazil. *Mammalia* 67:503-511.

IUCN 2008. Red list of the threatened species of the world: *Cerdocyon thous*. www.iucnredlist.org

Jácomo, A. T. A., Silveira, L. and Diniz-Filho, J. A. F. 2004. Niche separation between the maned-wolf (*Chrysocyon brachyurus*), crab-eating-fox (*Cerdocyon thous*) and the hoary-fox (*Dusicyon vetulus*) in the Cerrado of Central Brazil. *Journal of Zoology* 262:99-106.

Juarez, K. M. and Marinho-Filho, J. 2002. Diet, habitat use, and home ranges of sympatric canids in central Brazil. *Journal of Mammalogy* 83:925-933.

Lemos, F. G., Facure, K. G. and Azevedo, F. C. in press. A first approach to the comparative ecology of the hoary fox and the crab-eating fox in a fragmented landscape in the Cerrado biome at central Brazil. In: L. M. Rosalino and C. Gheler-Costa (eds.), *Middle-sized carnivores in agricultural landscapes.* Nova Science Publishers

MINISTÉRIO DO MEIO AMBIENTE – MMA 2008. Livro Vermelho da Fauna Brasileira Ameaçada de Extinção. WWW.mma.gov.br/port/sbf/fauna/index .

Montgomery, G. G. and Lubin, Y. D. 1978. Social structure and food habits of crab-eating fox (*Cerdocyon thous*) in Venezuelan llanos. *Acta Cientifica Venezolana* 29:392-393.

Morato, R. G., Rodrigues, F. H. G., Eizirik, E., Mangini, P. R., Morato, R. L. G. and Azevedo, F. C. C. 2004. *Plano de ação: pesquisa e conservação de mamíferos carnívoros do Brasil*. Centro Nacional de Pesquisa e Conservação dos Predadores Naturais – CENAP, IBAMA, São Paulo, Brazil.

Oli M. K., Taylor I. R. and Rogers M. E. 1999. Snow leopard *Panthera uncia* depredation of livestock: an assessment of local perceptions in the Annapuma Conservation Area, Nepal. *Biological Conservation* 68: 63-68.

Pitman M. R. P. L., Oliveira T. G. de, Paula R. C. and Indrusiak C. 2002. Manual de identificação, prevenção e controle de pradação por Carnívoros. IBAMA, Brazil.

Rabinowitz A. R. 1995. Jaguar conflict and conservation, a strategy for the future. In: Bissonette J. A. and Krausman P. R. (eds.), *Integrating people and wildlife*. Wildlife Conservation Society, Maryland, USA. Pp. 364-367.

Sillero-Zubiri, C., Hoffmann, M. and Macdonald, D. W. 2004. *Canids: Foxes, Wolves, Jackals and dogs, 1st edition*. IUCN/SSC Canid Specialist Group. Gland, Switzerland and Cambridge, UK.

Sillero-Zubiri, C. and Switzer, D. 2004. Management of canids near people. Pages 257-266. In: Sillero-Zubiri, C., M. Hoffmann and D.W. Macdonald (eds.), *Canids: foxes, wolves, jackals and dogs. Status survey and conservation action plan, 2nd edition*. IUCN Canid Specialist Group, Gland, Switzerland and Cambridge, UK.

Sillero-Zubiri, C. The Canidae in 2009 in Wilson, D. E. and Mittermeier, R. A. (eds.) 2009. *Handbook of the Mammals of the world. Vol 1. Carnivores*. Lynx Edicions, Barcelona, Spain.

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