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## Traffic mammals attraction of the highway MT-358.

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**Abstract:** The main ecological impacts caused by roads are: changes in behavior; stress and / or removal of native species; modification in the food chain; fragmentation and alteration of habitats by edge effect; population isolation and loss of individuals due to vehicle collision. This work was carried out on the highway MT-358, which connects the city of Nova Olímpia to the State University of Mato Grosso campus of Tangará da Serra, with approximately 40 km of route. The records of the trampled animals were carried out between December 2016 and December 2017. A total of 21 monthly samplings were recorded during the study period. Thirty-eight mammals were recorded on the MT-358 highway during the study period, totaling 13 species of mammals distributed in 08 families. The most abundant species were *Tamandua tetradactyla* (23.7%), *Euphractus sexcinctus* (15.8%) and *Cerdocyon thous* (15.8%). These three most abundant species account for 55.3% of occurrences. Therefore, we suggest that road management institutions use methods that will help ensure adequate migration to the fauna and reduce the risk of impact of running over fauna on already paved roads.

**Key words:** Run-off, Tamanduá-mirim, Highway.

### Introduction

In Brazil, mammals are represented in 720 species distributed in 246 genres (PERCEQUILLO & GREGORIN, 2018). This represents about 13% of the world's mastofauna. These numbers mean that Brazil has the greatest mammal wealth of the entire neotropical region (FONSECA *et al.*, 1996). Mammals occurring in the Cerrado total about 195 species, of which 18 are endemic and 17 are included in the national list of Brazilian endangered species (MMA, 2003).

In a study carried out by Vieira (1996), an annual estimate of 2,700 wild mammals hit annually on the main federal highways that cut the threatened Cerrado biome is reported, and certainly the numbers verified by him were an underestimate and the present figures are even higher.

The main ecological impacts caused by roads are: changes in behavior; stress and / or removal of native species; modification in the food chain; fragmentation and alteration of habitats by edge effect; population isolation and loss of individuals due to collision with vehicles (TROMBULAK & FRISSEL, 2000).

Three types of direct effects of highways on vertebrates are considered. The first is the "barrier effect," since roads block or restrict movements of

certain populations. The second is the "avoidance effect" of highways. Several species of large mammals have very low population density in areas distant of 100 m. to 200 m. of highways. The third type of effect is the loss of individuals by trampling (ROMANINI, 2000).

In a survey carried out by the Brazilian Center for Studies on Road Ecology (CBEE) with an application, the Urubu, through statistics can show how high is the number of road accidents, estimated to be hit 470 million animals on Brazilian roads, being the small vertebrates 90% of these, 9% birds and 1% large mammals (ECOLOGY OF ROADS).

This work aims to evaluate the richness of species of mammals hit by the MT-358 highway between the municipality of Nova Olímpia and the State University of Mato Grosso, Tangará da Serra-MT campus.

### Methods

This work was carried out on the MT-358 highway, which connects the city of Nova Olímpia to the State University of Mato Grosso campus of Tangará da Serra, with approximately 40 km of route (Google Earth).

The climate is of type Aw of Köppen, that is, semi-humid tropical, the region presents two defined

seasons, a dry season of May to September and another rainy of October to April (DALLACORT *et al.*, 2011).

The records of the trampled animals were carried out between December 2016 and December 2017. A total of 21 monthly samplings were recorded during the study period.

The routes on the highway were carried out with an average duration of 2 hours on each day of sampling. Being 1 hour in the morning period and 1 hour in the afternoon period. It should be noted, however, that obtaining such records was not the main objective of travel. Therefore, many trampled mammals, particularly in the case of opossums (*Didelphis* sp.), Were not recorded. Only the mammals found dead on the shoulder or lane were recorded.

In the analysis of the data, the relative abundance of each species was estimated through the percentage of records of the species in relation to the total number of individuals of the trampled species.

## Results and discussion

Thirty-eight mammals were recorded on the MT-358 highway during the study period, totaling 13 mammal species distributed in 08 families (Table 1).

The most abundant species were *Tamandua tetradactyla* (23.7%), *Euphractus sexcinctus* (15.8%) and *Cerdocyon thous* (15.8%). These three most abundant species account for 55.3% of occurrences.

The species *Tamandua tetradactyla* accounted for 23.7% of the occurrences, in contrast to a study carried out by Rezini (2010), surveying the mammals struck on the highways of Paraná and Santa Catarina, *T. tetradactyla* represented 1.02% of the occurrences.

Melo and Santos-Filho (2007), recorded the same species with greater abundance in the occurrences, *Cerdocyon thous* with 28.35%, *Euphractus sexcinctus* with 21.26% and *Tamandua tetradactyla* with 18.90%.

The Cachorro-do-mato and Tatu-peba species were also the most frequent in a study by Casella *et al.* (2006), registering the most frequent species of fauna trampling between Campo Grande and Aquidauana-MS, the cachorro-do-mato (*Cerdocyon thous*) with 26.9% of the records, Tatu-peba (*Euphractus sexcinctus*) with 21.3%.

The high number of trampling of these three species can be attributed to the fact that the species of carnivorous mammals, anteaters and armadillos, are species of wide territorial distribution (Caceres *et al.*, 2012), thus necessitating crossing the highways during foraging.

The species *T. tetradactyla* and *E. sexcinctus*, in addition to having a slow movement, have poorly developed vision that can be overshadowed by the headlights of the cars when crossing the highways during the nocturnal period (MELO & SANTOS-FILHO, 2007). According to Emmons & Feer (1997), *E. sexcinctus* is an omnivorous species that feeds even from dead animals and can be attracted to the remains of other animals run over.

Another species with a high mortality rate in this work is *Cerdocyon thous*, which according to Barros *et al.* (2016), the high mortality rate found on *C. thous* roads may be related to habitat changes, such as the use of roads for nocturnal foraging and dispersal. And allied to this is the massive increase in the fleet of vehicles every year.

Among the threatened fauna, three species were found in the vulnerable category by ICMBIO, with a record for each species: *Lycalopex vetulus*, *Myrmecophaga tridactyla* and *Puma yagouaroundi* according to Ordinance No. 444/2014 (IBAMA, 2014).

The highest number of individuals hit by a continuous track will present an intermediate value in the continuous - dotted range presenting a smaller number of trampling in a dotted range, which may indicate that the driver 's visibility interferes directly with the number of individuals hit.

**Table 1** - Number of individuals and percentage by mammal species run over in the MT-358, from December 2016 to December 2017, in the State of Mato Grosso.

Family	Species	Common name	N	%
Canidae	<i>Canis familiaris</i>	Cão-doméstico	1	2,6
	<i>Cerdocyon thous</i>	Cachorro-do-mato	6	15,8
	<i>Lycalopex vetulus</i>	Raposa-do-campo	1	2,6
Caviidae	<i>Hydrochoerus hydrochaeris</i>	Capivara	2	5,3
Cebidae	<i>Sapajus</i> sp.	Macaco-prego	2	5,3
Dasypodidae	<i>Dasybus novemcinctus</i>	Tatu-galinha	2	5,3
	<i>Euphractus sexcinctus</i>	Tatu-peba	6	15,8
Erethizontidae	<i>Coendou</i> sp.	Ouriço-cacheiro	1	2,6
Felidae	<i>Felis domesticus</i>	Gato-doméstico	3	7,9
	<i>Puma yagouaroundi</i>	Gato-mourisco	1	2,6
Myrmecophagidae	<i>Myrmecophaga tridactyla</i>	Tamanduá-bandeira	1	2,6
	<i>Tamandua tetradactyla</i>	Tamanduá-mirim	9	23,7
Procyonidae	<i>Nasua nasua</i>	Quati	3	7,9
<b>Total</b>			<b>38</b>	<b>100,0</b>

## Final considerations

The road in the Serra de Tapirapuã region presents a negative impact factor for the conservation of the fauna, including endemic species of the Cerrado and / or endangered species, according to IUCN data. The direct impact caused by roads that cut places like mountains and reserves affect both day and night animal behavior.

Therefore, we suggest that road management institutions use methods that will help ensure adequate migration to the fauna and reduce the risk of impact of trampling of fauna on already paved roads and, above all, during the licensing process and pavement of the MT-358 the installation of passage of fauna, mainly in the buffer zone of the Serra de Tapirapuã.

## References

BARROS, T. O. *et al. Monitoramento da fauna silvestre atropelada na BR-101/RN/PB/PE. In: Anais do Congresso Brasileiro de Gestão Ambiental e Sustentabilidade - Vol. 4: Congestas*, 2016.

CÁCERES, N. C.; CASELLA, J.; DOS SANTOS GOULART, C. *Variação espacial e sazonal atropelamentos de mamíferos no bioma cerrado, rodovia BR 262, Sudoeste do Brasil. Mastozoología neotropical*, v. 19, n. 1, p. 21-33, 2012.

CASELLA, J.; CÁCERES, N. C.; GOULART, C. S.; PARANHOS-FILHO, A. C. *Uso de sensoriamento remoto e análise espacial na interpretação de atropelamentos de fauna entre Campo Grande e Aquidauana, MS. Simpósio de Geotecnologias no Pantanal*, v. 1, p. 321-326, 2006.

DALLACORT, R.; ARAUJO MARTINS, J.; HIROKO INOUE, M.; LOURENÇO DE FREITAS, P. S.; JUNIOR COLETTI, A. *Distribuição das chuvas no município de Tangará da Serra, médio norte do Estado de Mato Grosso, Brasil. Acta Scientiarum. Agronomy*, v. 33, n. 2, 2011.

*Ecologia de Estradas. Sistema Urubu, Módulo 1. Disponível em: <<http://cbee.ufla.br/portal/imgs/imagesCMS/publicacao/pdf/57.pdf>>. Acesso em junho de 2018.*

EMMONS, L.; FEER, F. *Neotropical rainforest mammals: a field guide*. 1997.

FONSECA, G. D.; HERMANN, G.; LEITE, Y. L. R.; MITTERMEIER, R. A.; RYLANDS, A. B.; PATTON, J.

L. *Lista anotada dos mamíferos do Brasil*. Ocassional Papers in Conservation Biology 4. 1996.

IBAMA. 2014. *Lista das Espécies da Fauna Brasileira Ameaçadas de Extinção. Anexo à Portaria n. 43, de 31 de janeiro de 2014, do Ministério do Meio Ambiente. Disponível em: <[http://www.icmbio.gov.br/cepsul/images/stories/legislacao/Portaria/2014/p\\_mma\\_444\\_2014\\_lista\\_especies\\_amecadas\\_extincao.pdf](http://www.icmbio.gov.br/cepsul/images/stories/legislacao/Portaria/2014/p_mma_444_2014_lista_especies_amecadas_extincao.pdf)>. Acesso em 22 de março de 2018.*

MELO, E. S.; SANTOS-FILHO, M. *Efeitos da BR-070 na Província Serrana de Cáceres, Mato Grosso, sobre a comunidade de vertebrados silvestres. Revista Brasileira de Zoociências*, v. 9, n. 2, 2007.

MINISTÉRIO DO MEIO AMBIENTE - MMA. *Espécies da fauna brasileira ameaçadas de extinção. Instrução Normativa nº 3, de 27 de maio de 2003, publicada no Diário Oficial da União n 101, de 28 de maio de 2003. Seção 1. p. 88-97.*

PERCEQUILLO A. R.; GREGORIN R. 2018. *Mammalia in Catálogo Taxonômico da Fauna do Brasil. PNUD. Disponível em: <<http://fauna.jbrj.gov.br/fauna/faunadobrasil/64>>. Acesso em: 21 Mar. 2018.*

REZINI, J. A. *Atropelamento de mamíferos em rodovias do leste dos Estados do Paraná e Santa Catarina, Sul do Brasil. Dissertação, Universidade Federal do Paraná*, 2010.

ROMANINI, P. U. *Rodovias e meio ambiente. Principais impactos ambientais, incorporação da variável ambiental em projetos rodoviários e sistema de gestão ambiental. Tese (Doutorado em Ciências) - Departamento de Ecologia, Instituto de Biociências, Universidade de São Paulo, São Paulo. 147 p., 2000.*

TROMBULAK, S. C.; FRISSELL, C. A. Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation biology*, v. 14, n. 1, p. 18-30, 2000.

VIEIRA, E. M. Highway mortality of mammals in central Brazil. *Ciência e cultura (São Paulo)*. São Paulo, v. 48, n. 4, p. 270-272, 1996.