NEGATIVE IMPACTS OF ROADS ON THE RELATIVE ABUNDANCE OF GIANT ANTEATERS IN THE BRAZILIAN CERRADO

ALBERICI; Vinicius [1], DESBIEZ; Arnaud Léonard Jean[2], CHIARELLO; Adriano Garcia[3]

RESUMO

The giant anteater (Myrmecophaga tridactyla) is one of the species most affected by roadkill in the Cerrado of Mato Grosso do Sul, Brazil. If this trend continues, it could drive entire local populations of this vulnerable species to extinction. To address this threat, the Anteaters & Highways Project is evaluating the impacts of roads on giant anteater populations in the Cerrado. To assess the effects of road and landscape variables on giant anteaters, we sampled 120 landscapes within a 10km buffer zone of two paved roads – MS-040 and BR-267, with low and high traffic volume, respectively. We sampled each landscape with three camera-traps for 30 days, during the dry season of 2018 and 2019, with a total effort of 10,529 days of sampling. We used Royle-Nichols occupancy models, assuming that the probability of detecting the species is conditional on its local abundance. Preliminarily, we ran logistic regression models to select the best spatial scale (200ha, 400ha or 600ha) for the effect of each landscape covariate on giant anteater occurrence. We then used sampling effort and landscape covariates (i.e. distance from road, density of water, percentages of each land cover class and Shannon diversity index) as predictors of detection (r) and relative abundance (Lambda) of the giant anteater. Model selection was based on Akaike Information Criterion corrected for small samples (AICc). Giant anteaters were present in 85 of 120 landscapes sampled. We found that the detection probability of the giant anteater was positively related to the sampling effort and the percentage of native forest in the landscape (600ha), while the relative abundance of the species was positively related with road distance, being lower closer to the road and higher far from it. Interactive models indicated that the relative abundance of giant anteaters decreases more steeply with the proximity of MS-040 than BR-267. One possible explanation for this result is an overall higher abundance of giant anteaters in MS-040, than in BR- 267, where the population could be more depleted due to higher roadkill rates. MS-040 is much more recent than BR-267 and probably had less impact on giant anteaters' population over time. Another hypothesis, supported by telemetry data, is that MS-040 is not acting as a barrier for giant anteater movement – more individuals crossed MS-040 than BR-267. This could be explained by characteristics of the landscape, but also due to a time-lag in giant anteaters' behavioral response. In this case, it is possible that the MS-040 is indeed impacting the population of giant anteaters more intensely, at least at these two particular road sections, which are both roadkill hotspots. Further modeling indicated a possible threshold distance for the road effect: the relative abundance of the species is constant and minimal up to a distance of ~3km from the road, from which it increases linearly. Despite our results indicating that both the linear and the threshold response were equally plausible, this should be explored further, especially considering that it could be an important guide for the implementation of specific mitigation measures.

PALAVRAS-CHAVE: Myrmecophaga tridactyla, Occupancy modeling, Road ecology, Xenarthra

[1] Laboratório de Ecologia e Conservação (LAEC), alberici@usp.br
[2] Departamento de Biologia, adesbiez@hotmail.com
[3] Universidade de São Paulo (USP), bradypus@ffclrp.usp.br