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Mariki, Heavenlight

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Pattern and composition of wildlife roadkill across urban-rural gradient in an African expanding city

Heavenlight L. Mariki, Stella T. Kessy, Robert M. Byamungu & Alfian A. Rija

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Abstract

Urban roads are known to affect wildlife fauna but most assessments of the impacts of roads have been done in cities of the developed world with comparable studies still lacking from sprawling cities of the developing countries. This gap precludes the ability of the city management authorities in designing the appropriate mitigation and conservation measures especially during this era where the road networks in African cities is expanding steadily. We surveyed 48 km of roads transcending an urban-rural gradient in Morogoro city, Tanzania to understand the patterns of road kills, taxonomic composition and used the Generalized linear modeling to determine the ecological and environmental factors mostly influencing the road kill abundances. We also assessed the conservation status of the road kills to propose measures to improve biodiversity conservation in this urban landscape bordering a global biodiversity hotspot. We found 929 killed animals belonging to 62 families and 23 orders and 5 taxa (classes) with the majority kills being insects. There was a significant difference on road kill abundance between taxa but no significant difference in kill abundance across the urban-rural gradient. Furthermore, we found that designated road speed limit was significantly positively associated with increased road kills with the insect taxon occurring most abundant in the kill. Additionally, we found three species involved in the animal-vehicle collision threatened with extinction and over 50% of the recorded road kills lacking information on their conservation status on the red list at all. These data may be useful in improving the strategies to reducing the animal-vehicle collisions and to inform the potential biodiversity monitoring in the study area and elsewhere in Africa's cities faced with similar urbanization challenges.