PROGRESS REPORT

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Perception and Knowledge of Road Users to the Roadkill Mortality in Nyungwe National Park.

Roads spanning the national parks have huge negative effects on the biotic community of living organisms and consequently leading agent to decline of wildlife population (Fahrig and Rytwinski 2009). Mortality due to roadkill remains of global concerns in the tropical areas. Despite an increasing body of data documenting the frequency and distribution of roadkill, and its consequences for specific animal populations, scientists and engineers alone have been unable to develop solutions that challenge the prevailing indifference to the problem. To answer the question of (Roedenbeck et al. 2007) "Under what circumstances do roads affect population persistence?", different research has been conducted in different area of the world (Fahrig and Rytwinski 2009; Filius, Hoek, and Hooft 2020; Goosem 2007; Hetman et al. 2019; Laurance, Goosem, and Laurance 2009), and several factors have been identified to be the main cause of roadkill mortality. Animal-related parameters (animal density, ranging behaviour, diet, and body size) have been identified to be the major cause of roadkill. In addition, there are other important factors identified to influence the roadkill which are the road type, vehicle speed, and traffic volume (Drew 1995; Freitas, Sousa, and Bueno 2013). On the other hand, limited knowledge and low attitude to the wildlife conservation of road users especially drivers, can positively influence the increase in road killing mortality. Although Nyungwe Management Company documented the pattern of roadkill in Nyungwe National Park, there is still a gap of understanding the attitude and knowledge of road users to the roadkill mortality in Nyungwe National Park. The current study is aimed at assisting park managers in developing park management plans by understanding the attitude and knowledge of road users in Nyungwe National Park.

The specific objectives will be: (1) to understand the level of knowledge/awareness of road users especially drivers to the road kill mortality, (2) to understand their point of view to the cause of animal vehicle collusion in NNP and (3) to examine their reaction when different wildlife species were seen on the road by drivers and how they rate the value of wildlife from mammals to a small animals like birds and reptiles. The findings will help park management in designing better management plans for the conservation of wildlife in Nyungwe National Park especially those edge tolerant animals including l'Hoest's monkeys.

Methods

Study Area - Project Site

Nyungwe National Park is a Key Biodiversity Area (KBA) located in south west Rwanda (latitude 2° 15' and 2° 55'S, longitude 29° 00' and 29° 30'E) and it is one of most biologically important Afromontane forests in Africa (Plumptre et al. 2007). With an area of 1,019km^2, and altitudinal range between 1600m and 2950m, it is the largest and most floristic protected area in Rwanda (Plumptre et al. 2007). The Park is part of the Albertine Rift and is protected for its conservation importance and high levels of endemism. The NNP supports a diverse abundance of flora and fauna, including many endangered, rare and endemic species adapted to the montane forest

landscape. It is a home for more than 13 non-human primate species of which the eastern chimpanzee *(Pan Troglodytes schweinfurthii*) is classified as endangered and three other species (*Allochrocebus lhoesti*, *Colobus angolensis ruwenzorii* and *Cercopithecus hamlyni*) are classified as vulnerable on the IUCN Red list of threatened species. In addition, it hosts 19 of 89 mammals, six of 280 bird species, five of 33 amphibian species and 12 of 1105 plant species which are globally threatened (Plumptre et al. 2007). Nyungwe has one main (tarmac) road used as a connection of southern province with Western province known as Kigali-Rusizi and other secondary roads like Pindura to Bweyeye, Uwinka-Banda and many others are not used by many people. This study will use the section of the main road known as Kitabi-Gisakura.

Data collection

Sixty to a hundred questionnaire surveys will be conducted among drivers at bus stops in Kitabi, Pindura, Uwinka and Gisakura to determine driver attitudes, knowledge, and level of awareness of AVCs. Public transport drivers will be highly targeted because they frequently use the road and therefore were assumed to be more informed about animal-vehicle interactions on the road. The second target will be motorcycle drivers from Bweyeye who always their transport within the forest do to understand the level of their knowledge. Passengers will be asked questions at the bus stations of Uwinka and Pindura. Both Drivers and passengers will be asked to rate the main causes (accidental, speed, darkness, bad weather, animal behavior, intentional, bad weather) of AVC on a scale (5 = strongly agree, 4 = agree, 3 = neutral, 2 = disagree, 1 = strongly disagree). But only drivers will be asked about their reactions (on a score 2 =strongly agree, 1= agree, 0 = disagree) on seeing a number of animals, including l'Hoest's monkey, baboons, vervet monkeys, reptiles and other wild animals crossing the road. The reactions will be categorised as hit, swerve, slow and stop.

Data analysis

Data will be analyzed using SPSS and R Core Team (2022). Descriptive statistics will be used to analyse the respondent's demographics. A Chi Square test will be used to test the level of significance of binary response like to test whether Animal Vehicle Collusions (AVCs) occur during the day or night, whether the driver thought that AVCs is a major problem or not on the roads, whether the driver showed respect to wildlife on the road or not, and whether the driver had attended educational awareness programs on impacts on roads or not.

Output

At the end of this study, a report highlighting the level of knowledge and attitude from road users will be produced. In addition, an awareness campaign of local leaders and security organs in the districts where Nyungwe National Park overlaps will be prepared. Furthermore, the paper will be published in a peer-reviewed journal to make the findings available worldwide.

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