SHORT COMMUNICATION

IMPACT OF VEHICULAR TRAFFIC ON BIRDS IN TIRUCHIRAPPALLI
DISTRICT, TAMIL NADU, INDIA

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Impact of vehicular traffic on birds in Tiruchirappalli District, Tamil Nadu, India

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Abstract: Roads have numerous direct and indirect ecological impacts on wildlife. Roads constitute an extensive and integral part of our environment. Collisions with vehicles kill a large number of birds every year. The present study was carried out from January 2016 to December 2016. The data was collected from Nehru Memorial College to Pavithram Lake of Thuraiyur to Namakkal road of Musiri Tiruchirappalli District. During this study, we recorded a total of 64 birds belonging to 12 species killed due to vehicular traffic. A maximum of 11 birds were killed in the months of January and October, and a minimum of two bird kills were observed in the months of September and December. Of the 64 birds, the roadside mortality was observed to the tune of 25%, 20.3%, 14%, 12.5%, 10.9%, 4.6%, and 4.6% for Southern Coucal Centropus parroti, Common Myna Acridotheres tristis, House Crow Corvus splendens, Spotted Owlet Athene brama, Indian Jungle Crow Corvus cumulatus, Yellow-billed Babbler Turdoides affinis, and Large Grey Babbler Turdoides malcolmi. Other birds such as Asian Koel Eudynamys scolopaceus, Indian Roller Coracias benghalensis, Shikra Accipiter badius, White-breasted Waterhen Amuraornis phoenicurus, and White-browed Bulbul Pycnonotus sinensis accounted for 1.5% mortality. Suggestive measures to prevent wildlife loss due to vehicular traffic are presented in this communication.

Keywords: Bird mortality, Common Myna, ecological factors, roadkill, vehicle collision.

Roads are important part of human life for moving from one place to another with the help of vehicles. They restrict animal movement within the landscape and they cause roadside animal mortality due to vehicles (Van der Zande et al. 1980; Forman & Alexander 1998). Roads affect the surrounding environment in many ways to harm their neighboring floral and faunal diversity (Forman & Alexander 1998). Roads can alter animal behavior, with many animals being attracted to them (Santos et al. 2011). For example, ectothermic animals like reptiles visit roads to bask, and birds consume fallen grains from roadside and gravel to aid digestion (Noss 2002). Scavenging birds like corvids and raptors are attracted to the carcasses of other roadkill animals and are often killed themselves (Dean & Milton 2003; Antworth et al. 2005; Collinson 2013).

Road accidents with vehicles lead to death or injury of several groups of animals from small insects to large mammals all over the world. They affect the populations of both common and threatened animal species. Birds utilize roads for foraging, hunting, scavenging, shelter and this can increase their vulnerability to vehicle collisions (Orlowski 2005; Boves 2007; Huijser et al. 2007). Insectivorous and nocturnal birds follow insects that utilize roads for foraging, hunting, scavenging, shelter and this can increase their vulnerability to vehicle collisions (Orlowski 2005; Boves 2007; Huijser et al. 2007). Insectivorous and nocturnal birds follow insects that are attracted to headlight of vehicles during the night making them more vulnerable to collisions.

Most of the roadkill studies on wildlife have been taken up in protected areas and particularly on large mammals.
Impact of vehicular traffic on birds
Siv a & Neelanarayanan

In India, roadkill mortality studies outside protected areas are scarce, a few have been reported by Kumara et al. (2000), Vijayakumar et al. (2001), Sunder (2004), Pragatheesh (2011), Seshadri & Ganesh (2011), and Gubbi et al. (2012). According to Sundar (2004), during wet monsoon season, more number of bird mortality is recorded on the roads compared to the other seasons. These studies underline the importance of understanding how road characteristics and road surroundings influence roadkill numbers and hence the present investigation.

Materials and Methods

Study Area

The study area was selected between Nehru Memorial College and Pavithram Lake of Musiri Taluk (State Highway numbers 62 and 161 between Thuraiyur and Namakkal) (Figure 1). This is one of the busiest routes of this area and it is used commonly by two-wheelers, cars, public transport buses, and goods carriers of various sizes. The length of the road was 41km. The altitude of the chosen study area ranged 110–225 m. On the 41-km road stretch on either side, the following habitats of mostly rainfed crop lands, barren lands, human habitations, and a few forest areas were observed.

Methods

The present study was carried from January 2016 to December 2016. Roadkill surveys were conducted using a two-wheeler. Only birds killed due to vehicular traffic were observed and recorded approximately 10 to 15 days every month. Data on the roadkill species, number of individuals and the place of the kill was noted, and the latitude and longitude recorded using a hand-held Garmin etrax20 device; however, roadkill specimens were not collected from the encountered sites and only photographs were taken to aid in identification. The killed birds were identified up to species level using the field guide by Grimmett et al. (2011).

Results and Discussion

In total, 64 birds were encountered and recorded during the entire study period (Table 1; Image 1–8). There were 12 species of birds which belonged to six orders (Cuculiformes, Passeriformes, Coraciiformes, Accipitriformes, Strigiformes, and Gruiformes) and nine families (Cuculidae, Sturnidae, Corvidae, Coraciidae, Leiothrichidae, Accipitridae, Strigidae, Rallidae, and Pycnonotidae). In the months of January and October, a maximum of 11 dead birds were observed. On the other
Impact of vehicular traffic on birds

Siva & Neelamarayanan

hand, a minimum of two birds were seen in the months of September and December 2016 (Figure 2). Highest mortality in terms of numbers, i.e., 16 were found for Southern Coucal *Centropus parroti* followed by 13 for Common Myna *Acridotheres tristis*, nine for House Crow *Corvus splendens*, eight for Spotted Owlet *Athene brama*, seven for Indian Jungle Crow *Corvus (macrorhynchos) culminatus*, six for Yellow-billed Babbler *Turdoides affinis* and Large Grey Babbler *Turdoides malcolmi*, five for Indian Roller *Coracias benghalensis*, four for White-browed Bulbul *Pycnonotus luteolus*, three for Shikra *Accipiter badius*, and one each for Asian Koel *Eudynamys scolopaceus*, White-breasted Waterhen *Amaurornis phoenicurus*, and White-browed Bulbul *Pycnonotus sinensis*.

Maximum mortality (30) was recorded close to Devarappampatti and the adjacent forest areas (Devarappampatti Reserved Forest). As there are only three speed breakers in the stretch between Kannanurpalayam and Thathaianagarpettai, vehicles cross this distance at high speeds. The commuters traveling on two and four-wheelers near the forest areas throw food including food grains on either side of the road, which attract birds and eventually lead to the mortality of birds. More number of bird mortality in the months of January and October might be correlated with the movement of general public in their own and public vehicles before and after local festivals such as ‘Pongal’ and ‘Diwali’. During these months the vehicular traffic density would be more when compared to all other months in the year and this would have caused a higher number of bird roadkills. Among the recorded birds, there were nine omnivorous, two carnivorous, and one insectivorous bird. Scavengers or omnivorous birds were attracted to carcasses on the roads, and while feeding on them, were hit by vehicles resulting in their death. All the 12 species of recorded birds are common and are listed in the Least Concern category of IUCN but their role in the environment is essential.

The highest mortality of Southern Coucals in the present investigation is due to their habit of low height flight (1–2 m above the road; pers. obs. of first author) when crossing the road. Similarly, babblers also took low height flight while crossing the road. Common Myna has the habit of searching scattered grains and other

Table 1. Birds that were killed due to vehicular traffic in the chosen study area during the study period.

| Order       | Family           | Name of the bird             | Scientific name | Food habit | Number of bird roadkills |
|-------------|------------------|------------------------------|-----------------|------------|--------------------------|
| 1           | Accipitriformes  | Accipitridae                | Shikra          | Accipiter badius | Carnivorous             | 1          |
| 2           | Gruiformes       | Rallida                      | White-breasted Waterhen | Amaurornis phoenicurus | Omnivorous             | 1          |
| 3           | Cuculiformes     | Cuculida                     | Asian Koel      | Eudynamys scolopaceus | Omnivorous             | 1          |
| 4           | Strigiformes     | Strigida                     | Spotted Owlet   | Centropus (sinensis) parroti | Omnivorous             | 16         |
| 5           | Coraciiformes    | Coraciida                    | Indian Roller   | Coracias benghalensis | Insectivores            | 1          |
| 6           | Passeriformes    | Corvidae                    | House Crow      | Corvus splendens | Omnivorous             | 9          |
| 7           |                   | Indian Jungle Crow           | Corvus (macrorhynchos) culminatus | Omnivorous             | 7          |
| 8           |                   | Leiothrichida               | Yellow-billed Babbler | Turdoides affinis | Omnivorous             | 3          |
| 9           |                   | Large Grey Babbler          | Turdoides malcolmi | Omnivorous             | 3          |
| 10          | Pycnonotida      | White-browed Bulbul          | Pycnonotus luteolus | Omnivorous             | 1          |
| 11          | Sturnida         | Common Myna                 | Acridotheres tristis | Omnivorous             | 13         |
| **Total**   |                   |                              |                 |             | **64**                  |            |

Figure 2. Month-wise bird mortality observed and recorded in the study area.
Impact of vehicular traffic on birds

Siva & Neelanarayanan

Journal of Threatened Taxa | www.threatenedtaxa.org | 26 July 2020 | 12(10): 16352–16356

Image 1–8. Birds killed due to vehicle collisions during the study period. 1—House Crow | 2—White-breasted Waterhen | 3—Southern Coucal | 4—Common Myna | 5—Large Grey Babbler | 6—Yellow-billed Babbler | 7—Spotted Owlet | 8—Shikra. © T. Siva.
food particles on and alongside the road. Thus, it can be suggested that the common factors for the mortality of birds is the movement from one side to another side at low height, and getting attracted towards food on the road or along the road sides.

Roadkill studies in India has mainly focused on vertebrates with a few studies on invertebrates. Earlier, in Anamalai Hills, Vijayakumar et al. (2001) reported roadkill of vertebrate fauna such as amphibians, reptiles, birds, and mammals while Jeganathan et al. (2018) reported both invertebrate and vertebrate animals’ mortality. Wildlife mortality due to vehicular traffic in Mudumalai Wildlife Sanctuary and Tiger Reserve has been published by Gokula (1997) and Baskaran & Boominathan (2010). Roadkill of amphibians was earlier recorded by Seshadri et al. (2009) from the Sharavathi River basin in central Western Ghats. Roadkill mortality of snakes in the Malnad region, central Western Ghats, was given by Jagadeesh et al. (2014).

Earlier researchers reported the following factors to affect bird mortality on roads such as the volume of traffic, speed of vehicles, scavenging behaviour, individual configuration of roads, road density, foraging opportunities (Clevenger et al. 2003; Erritzoe et al. 2003; Holm & Laursen 2011; Kociolek & Clevenger 2011). All these factors corroborate the results of the present investigation. This study presents observations made in non-protected areas.

CONCLUSIONS AND RECOMMENDATIONS

It is evident from the results that the chosen study area is prone to bird roadkill due to vehicular traffic. Movement of birds from one side to the other side of the road at low height and feeding on food grains/carcasses found on or near the road could be the major reasons for the roadkill. Awareness about the importance of birds needs to be created among the drivers of vehicles who frequently/regularly use the road.

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