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Wildlife Mortality on Single Track Bhalwal Road, Sargodha, Pakistan

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ABSTRACT: *Wild animals are very important for our ecosystem maintenance. In the last few decades, the rate of animal's accident on roads has increased due to heavy traffic. This research was carried out to find the reasons for road mortality of animals on Bhalwal Road, Sargodha, Punjab, Pakistan. It was noticed various animals like rats, porcupines, lizards, snakes, turtles and jackals lived in crops and trees that were found around the road and they were killed by road traffic while crossing the roads. It was seen that almost 80 to 90 % of road mortality was due to over speed driving. Moreover, the travellers were not aware of the importance of these common wildlife, so they did not bother the animals moving on the road. It was observed that most of the animals that killed on roads belonged to reptiles (Monitor Lizards'), amphibians (Frogs and Tortoise) birds (crow) and mammals (Jackals, mouse, dogs, cats and porcupines). It was concluded in the study that there is a need to highlight the importance of wild animals for the locals, travellers and also for the stakeholders that start work on mitigation strategies that help to conserve these wild animals.*

Keyword: *Bhalwal, Sargodha, Mortality, Wildlife, Ecosystem, Mammals*

INTRODUCTION

Isolation of habitat and restricted movements of common wildlife affect the animals that living around the roads. Roads playing a vital role for animals that living on the earth. Most of the species which belonged to class reptiles and amphibians are killed by crossing roads in search of food, habitat or to meet other animal. Some species used roads to get heat, nesting, food or various other purposes (Fahrig and Rytwinski, 2009).

Most of work started in Canada by Canadian Wildlife Service (CWS) in 1970 and 1980 and later in 1992 to 1993 and reported that animals which living in water and land mostly affected by road accidents (Clevenge et al., 1994).

Traffic can affect animal populations in two ways: firstly to kill the animals and secondarily, by dividing the habitat of population into fragments (Gregory et al., 2021). Roads are very important tool for movement of animals from one place to another however, they can create a lot of chances to increase the mortality rate of animals that lived around the roads (Oddone and Nkomo, 2021).

Many other things can affect the mortality rate on the roads such as traffic rush, location of road and climatic conditions of that area (Clevenger et al., 2009). Biologists and zoologists have work on the new and safe movements facilities for the animals that live across the road (Forman et al., 2003). Some solutions such as fencing and channelling across the road can reduce the road mortality due to some new and safe ways of road crossing (Clevenger et al., 2009).

Traffic load on roads causes different types of effects on nature either directly or indirectly such as climatic changes and influences on natural environment. A lot of work is being done by many researchers and road management authorities on different aspects of roads to reduce the ecological effects of wild life on nature (Coffin, 2007).

Wild life conservation possibly driven by different ways such as tunnels constructions, overpasses, fencing around the roads and prevention of road mortality of common wildlife (Bennett, 2017). That effort is a remarkable work to decreased mortality rate of common wildlife in different countries such as America and Canada (Blaustein et al., 1994).

Various ecological changes such as food intake by man, cosmic rays, and acidic concentration of water leads to the transfer of predator species from one area to another that leads towards the decrease in number of wildlife species in certain area. Hundreds of masses of creatures every year murdered by road traffic flow (Rytwinski, 2016).

Because of animals shifting from their habitat to another area they need to cross the road that leads towards road collisions and animal killing. Expansion of roads to make them wide also causes the reduction of wild life as their ecological systems are disturbed (Eigenbrod et al., 2009). Night vision animals have more mortality rate on roads (Mazerolle, 2004). Across the protected area the spreading of the roads has effects on incensement of the large animals (Grosman et al., 2009). In India and mostly many parts of Asia having different kind of religious or sacred places for the completion of their religious worships and gathering all around the nearest areas that consumes the area of flora and fauna near mountains. After creating that kind of situations mostly large animals spare that place but small animals not move and became the victims. From last 50 years the volume of the traffic on roads in Asia has increased (Seshadri et al., 2009). As in rest of the world, there are also certain issues concerning human wildlife conflicts in Pakistan but less documentation available yet (Ahmed et al., 2016). The studies from Pakistan has focused more on the northern regions of the country (Younas et al., 2018), where there is large number of wildlife but area is less human-dominated comparatively (Rehman and Khattak, 2020).

This study was conducted in order to know the mortality rate of various animals, birds, reptiles and amphibians on Bhalwal road, Sargodha and to find out their movement from one habitat to another for their survival.

MATERIAL and METHODS

Study Area

The present study was carried out from March to June 2018 to study the local wild animals such as jackals, dogs, reptiles, amphibians and other animals that live across the road at different sites. The selected sites were Site # 1; Bhalwal to 10NB(2KM), Site # 2; 10NB to Chak 22 NB (1KM), Site# 3; 22 NB to 23 NB(3KM), Site # 4; 23 NB to Ajnala lok (7KM), Site # 5; Ajnala lok to Sargodha (8KM). These sites were selected as these are the connecting

roads among different polluted areas and have running traffic load.

Study Visit Timings

Monthly two visits were done of each place for data collection. Data of killed animals was recorded from these sites. The method that we followed was direct field observation and counting of killed animals and traffic numbers. Beebee. (2013). First step was to tour the road twice a month and capture the pictures of killed animals on Bhalwal road. Second step involved collecting data of traffic vehicles average number in a month.

Road Kill Count

Number of killed animals was recorded during this study. The data was collected by road tours on regular intervals from April to August. We could only count the number but sampling was difficult due to the condition of animals and age was also unidentifiable. Simple counting method was used for this purpose.

RESULTS

A total number of 242 killed animals were calculated during the study period. Mostly the night vision animals were killed by traffic due to heay road traffic such as trucks, loaders and long passenger buses. The number of jackals was high as compared to other animals on that road. It was perceived the carnage of these faunas on Bhalwal road was due to some high-speed heavy traffic on imminent time. The speed limit was above 100km/h without following the allowed limit rules. That was alarming speed on local road across the rural areas. The night idealistic animals used their night strategies to pass the road and mostly strike with high speed vehicles. In these animals mostly the idlest animals were maximum. The load on that road mostly was between 7pm to 8:30 am. During this duration, 34 lizards were found dead from April to August 2018. Due to many reasons' reptiles were killed by the road traffic such as slow speed (Fig. 1).

Fig. 1. Lizard killed on Bhalwal Road, Sargodha, Pakistan

Porcupines were killed by traffic due to nocturnal way to find out the food and its habitats were seen around the roads (Fig. 2).

Fig. 2. Parcoupines killed on Bhalwal Road. Sargodha, Pakistan

Due to unavailability of large water bodies around the road the number of amphibians was less as compared to other animals. Two frogs and one

tortoise were also noticed killed in study time period (Fig. 3).

Fig. 3. Tortoise killed on Bhalwal Road. Sargodha, Pakistan.

Although some seasonal pond had formed by rain. N=145 was the greatest number of killed mammals on the Bhalwal road as compared to other animals in this study duration. Mouse was the smallest animal noticed on Bhalwal road, Sargodha, Punjab, Pakistan (Fig. 4).

Fig. 4. Jackal killed on Bhalwal Road. Sargodha, Pakistan

A jackal was also noticed killed on road and has shown in (Fig. 5).

Fig. 5. Mouse killed on Bhalwal Road, Sargodha, Pakistan

It was very important thing on Bhalwal road the mouse or small animals just like that were very rare. This matter might be a low rate of these animals' existence, low numbers of their habitats, low number of their life helping factors. Their counting of killing animals were so difficult due to very small body size as compared to the busses or road traffic. Their body was consumed by microorganisms with very fast and very quick. Five-month data were collected on the basis of road mortality of common wild animals that lived across the Sargodha to Bhalwal road. In April the area of that Bhawal road was going to be tough because of temperature. April having some sort of rains but not as the month of June, July and August. Counted numbers of the dead animals in the month of the April mostly observed the species were killed on the night time.

The monitor lizards mostly killed on the morning times. Snakes were not observed in the month of April. Jungle crow were observed during afternoon and may be due to cross the road but having a high weight of that birds make a collision with large vehicles such as trucks, 12 wheelers or long passengers' buses. No amphibians were observed

during this month. These ponds may be produced by the rains on that area in the months of May, June, July and August. Mammals observed all the months of years due to large numbers of these animals having their habitats. Results were analysed by the statistical analysis and used the two way ANOVA. The p value was <0.05.

In month of May, the temperature of Punjab area is mostly 38 to 45 ℃. Due to rain some pounds were formed automatically across the road sides of Bhalwal road. When we saw the total number of killed animals in the month of May, it was n=51. Reptiles were observed but no snake killed. Amphibians have nothing because of water availability in almost zero. In view of monitor lizard mostly observed the young and matured monitor lizards. It is also observed that the speed of that animals and its weight takes it on 90% chances to killed through traffic when it passes through the road. It had both side habitat. Snakes are observed by some native presents. But there was no road mortality of snakes on that month. it was due to the speed and sensor ability of stimulus acceptance on different body parts. Among birds only jungle crows were observed. Jungle crow has a large weight and when it crossed roads the collision of that birds was almost possible due to low fly. Mammals have large numbers of road mortality due to large size large numbers and night visionary behaviours. It is also observed that the amphibians also seen in that month.

In the month of June, the total number of murdered faunas was n=29. Number of killed reptiles was 5 but only observed 4 monitor lizards. There was a snake killed in that month of June. Amphibians were less but found 1 killed tortoise and 2 frogs because of water availability. We mostly observed the young and matured monitor

lizards were killed in that month. It was also observed that the speed of that animals and its mass receipts it on 90% risks to murder through traffic when it passes through the road. It has both sides habitats. When we saw the birds, jungle crow was observed. Jungle crow have a large bulk and when it cross roads the crash of that birds is almost conceivable due to squat fly. Mammals had large numbers of road mortality due to large size large figures and night idealistic manners. The killing number of frog and tortoise in that month indicates a pond well contacted due to increased raining. Total number of killing animals in June was 29 that was less as compared to May. It was a difference due to different numbers of crossings on that road on different time framework of time.

An overall five months data of killed animals were represented in (Fig. 6)

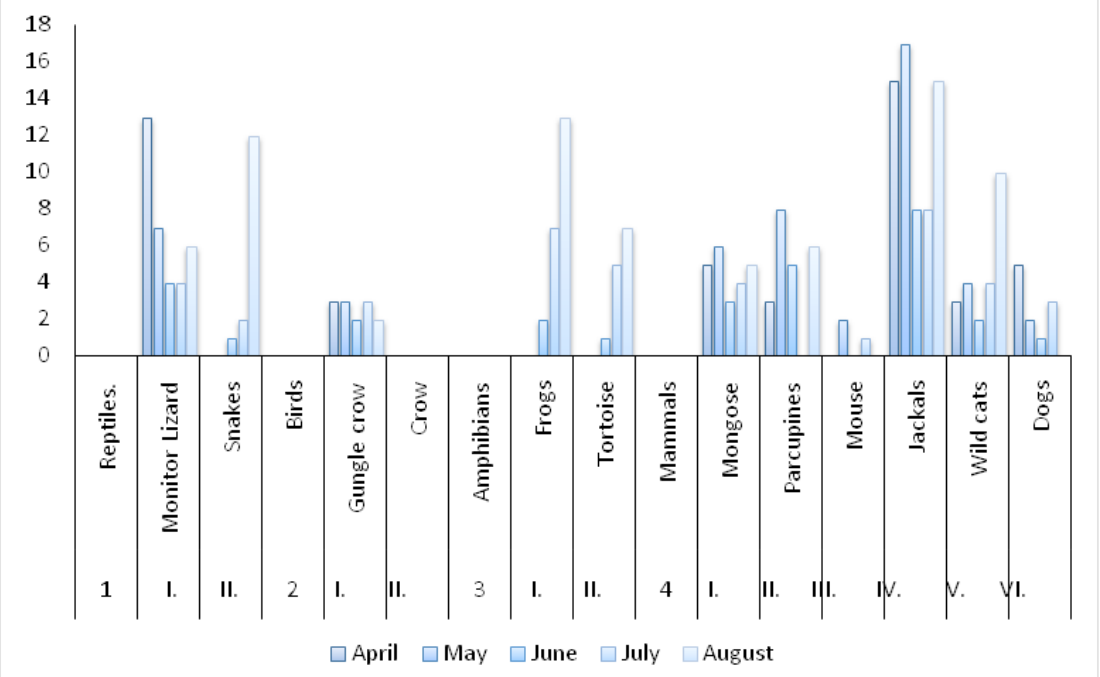

Fig. 6. A record of total number of killed animals in 5 months (April-August)

DISCUSSION

This study helped us to identify the number of animals from different species that are being killed by road accidents every day. Different reasons are responsible for this killing of animals as they cross the road. The study was conducted on Bhalwal road, Sargodha, Pakistan. During observation it was noted that the total killed numbers of animals was 242. In five months observations, the highest mortality rate was obtained for mammals that was 47.9 % followed by amphibians that was 26.31 % and the 24.23 % for reptiles. This was also supported by previous study in Pakistan where the highest rate of killing was observed for mammals (Akrim et al., 2019). Maximum number of jackals indicate that they came there for feeding on other dead animal carcasses and got killed by themselves due to poor visibility of drivers at night.

The results of birds killing revealed that only thirteen birds were found dead. So, the death rate was 2.63 % of the total killed animals. The bird's mortality on Bhalwal road when compared to the road mortality of birds in previous study gives the same results and the reason for less number is because of their flight behaviour. birds are mostly killed by electricity pools around the roads on height (Akrim et al., 2019).

In our research work, the number of killed animals increased in the amphibian's phylum that was 26.31 %. Due to pond constructions in the rainy season some ponds formed due to lower surface across the road on Bhalwal road Sargodha. Less speed, less development of behaviours learning and some other crossing reasons made them contact with traffic and collisions occurred. But in April and May have no road mortality due to almost zero water or pond availability.

In our research we identified that reptiles accounted for 24.23 % of total road killed animals that was third highest number on Bhalwal road. Reptiles have less speed due to large body size such as monitor lizards. Some other reasons may be the large numbers of habitat, and less speed. So, the mortality rate is going on the large

numbers. Some reptiles such as snake come to roads for thermoregulation that leads to their death by vehicles (Akrim et al., 2019).

Many tools can be used to control the road mortality of common wild life. Some steps that can be taken immediately in large populated roads of Pakistan are fencing around the road as done on M1 and M2 motorway. It may be expensive but it could be less expensive when local texture used. Speed limit boards are required on each road and fine should be imposed on over speeding by the vehicles. Speed boards have been used by the highway authority or 1124 station on Bhalwal road Sargodha. Also removing of tree top can improve the visibility of animals and can help them to avoid road kills. Although more practical solutions are required to reduce the number of killed animals.

CONCLUSION

This study helped us to understand traffic as a major threat to wildlife. As wildlife is very important for the ecosystem. Moreover, management should nee to involve at national level in order to secure these animals. Limited research is carried out so far in Pakistan, so, there is need to develop practical solutions to conserve wildlife of Pakistan.

ETHICAL APPROVAL

The study was approved by the intuitional ethical review committee.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

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