

Impact of Existing National and State Highways on Wild Animals of Pench and Satpura Tiger Reserve

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Abstract

The influence of traffic highway on the activities of wild animals along the NH-7 & NH-69 between periods of 1996 to 2008 was studied. These Highways are important for transportation and traveling for Madhya Pradesh state from economic point of view, where NH-69 connects Bhopal-Chhindwara-Nagpur while NH-7 connects Nagpur to Jabalpur. The results of the undertaken studies showed that there occur a large number of accidents by motor vehicle round the year which results in a great loss to the wild life and thereby reducing population variability and genetic diversity thus ultimately disturbing the ecological equilibrium. Furthermore, it also creates a serious hazard to the existing flora and fauna of the area by emission of toxic contaminants like heavy metals, dust, smoke which results in different type of pollutions. The constructed highways create barrier effect and destroy natural habitat by reducing communication, foraging, reproduction etc. Due to existence of these highways the animals not only dissuade themselves from crossing road but also restrict themselves to make their habitat near by the highways, so the mitigating techniques and all the preventive measures should be taken to reduce habitat fragmentation and the eco system losses.

Keywords: NH-National highway; SH-State highway; Barrier effect; Roads; Railways; Vertebrates; Mortality

Introduction

Roads and other traffic lines are one of the most important means of transportation and without the developed roads one could not think about the socio-economic development of the area. Road accidents are now becoming a great threat to wild animals. When any road accident takes place, there occurs a great loss to the wild life as well as human beings; however, the actual loss is much higher as most of the accident cases go unreported [1].

The forest area is a natural habitat for animals where animals move to prey, to save themselves from predators, seek shelter, in search of mates etc. The highways near the forest area with a heavy load of traffic results in various kinds of pollutions and ecological disturbances and also create a barrier to wildlife. The Constructed roads divide terrestrial animal populations into more or less isolated subpopulations, thus destroying their habitats and adversely affecting their activities of foraging, reproduction, communication etc. through the so-called "barrier effect" [2]. Most of the animals are afraid of loud voices and the moving vehicles restrict the animals from crossing the roads and also using road side habitat areas. Various means which can aid in creating barrier effect are roadside ditches and fences, bare road surfaces, causes of noise and air pollutions, horns and headlights of vehicles, heavy traffic on roads etc. All these barriers results in ecological disturbances there by disturbing food chains and also reduces genetic diversity [3].

Study area and Methods

Impact of existing NH-69 is an important road connecting Bhopal to Chhindwara, Nagpur with two lane road and other Matkuli to Pachmarhi passes though forest area of Hoshanagabad Satpura Tiger reserve [4]. In Seoni District another NH 7 passes though the Pench tiger reserve area both of which contain rich wild animal population particularly important for conservation of wildlife. Both area already has many adverse impact on environment, wild life conservation and biodiversity like Air pollution, Noise pollution, Oil spill, illegal removal

of road side vegetation there are also cases of road accident most of which goes unreported due to lack of information among forest department officials regarding species like snake, jackal, birds, squirrel, languor etc. [5]. Both roadside area are covered with dry deciduous forest and not having clear visibility for a very long distance, conditions are usually same in all the three seasons. According to Field Director, Pench National Park, around 97 cases of accidents were reported on NH-7 along the periphery of Pench during the year 1996-2006.

Materials and Methods

Material for this study was obtained from forest department data during the period 1996 to 2008. The specific motility was determined on the basis of reported official accidental record of vehicles.

Results and Discussion

Most of the animals which are involved in accidents, try to find shelter for their protection. Some animals recover from accidents while others able to walk a short distance and die eventually and that's why the cases go unreported [6]. Some of the graphic images are shown in the side panel. As shown below in the Tables 1 and 2 the mortality is common. The table shows the recorded accidental cases but apart from this most of the cases of some reptiles, butterflies, insects and amphibians are unreported. These data are being collected from only the forest reserve areas like sanctuaries and national parks. Additionally there are many more areas like the network of roads and railway tracks

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| S.No | Year | Mortality due to Road Accident | | | | | | Total |
|------|------|--------------------------------|---------|---------|--------|-------|--------|-------|
| | | Panther | Sambhar | Cheetal | Monkey | Hyena | python | |
| 1 | 1995 | 01 | - | - | - | - | - | 01 |
| 2 | 1997 | 01 | - | - | - | - | - | 01 |
| 3 | 1999 | - | 01 | - | - | - | - | 01 |
| 4 | 2000 | - | - | 02 | - | - | - | 02 |
| 5 | 2001 | - | 02 | 02 | - | - | - | 04 |
| 6 | 2002 | - | - | 01 | - | - | - | 01 |
| 7 | 2003 | - | - | 01 | - | - | - | 01 |
| 8 | 2006 | - | - | - | - | 01 | - | 01 |
| 9 | 2007 | - | - | - | 01 | - | - | 01 |
| 10 | 2008 | - | - | - | - | - | 01 | 01 |
| | | 02 | 03 | 06 | 01 | 01 | 01 | 14 |

Table 1: Mortality due to vehicle accident during the year 1995 to 2008 Satpura Tiger Reserve, Hoshanagabad.

| S. No | Year | Mortality due to Road Accident | | | | | | Total |
|-------|-------|--------------------------------|---------|---------|----------|------------|--------------|-------|
| | | Tiger | Sambhar | Cheetal | Chinkara | Black buck | Barking Deer | |
| 1 | 1996 | - | - | 08 | - | - | - | 08 |
| 2 | 1997 | - | - | 10 | - | - | - | 10 |
| 3 | 1998 | - | - | 05 | - | - | - | 05 |
| 4 | 1999 | 02 | 01 | 06 | - | - | - | 09 |
| 5 | 2000 | - | - | 10 | - | - | - | 10 |
| 6 | 2001 | - | - | 06 | - | - | - | 06 |
| 7 | 2002 | - | - | 07 | - | 03 | - | 10 |
| 8 | 2003 | - | - | 02 | - | 01 | - | 03 |
| 9 | 2004 | - | - | 14 | - | 01 | - | 15 |
| 10 | 2005 | - | - | 09 | 02 | - | 01 | 12 |
| 11 | 2006 | - | - | 02 | - | 01 | - | 03 |
| | Total | 02 | 01 | 79 | 02 | 06 | 01 | 91 |

Table 2: Mortality due to vehicle accident during the year 1996 to 2006 Pench Tiger Reserve, Seoni.

where mortality is so common where each day small animals and birds are hit by the train and vehicles but the cases are not reported by the concerned authorities. Wildlife mortality due to collisions with trains can be significant. Comparative mortality rates of some wild animals in Pench Tiger reserve and Satpura Tiger reserve are shown in (Figure 1). Mammals and birds seem particularly vulnerable, as shown by studies in Spain, The Netherlands and Czech Republic [7-9]. Differences in mortality between species groups are well portrayed by a survey of animal carcasses at the railroad Madrid-Sevilla (Spain). Along this railroad the annual kill was estimated at 36.5 kills/km (SCV 1996). About 57% of the casualties were birds, 40% were mammals while only 3% were reptiles and amphibians. Between 1985 and 1995 an average of 9-11% of the black bear population was killed by trains and cars each year [10].

Science Daily report (Sep.19, 2008) Spanish highway are increasingly incorporating walkways specially designed for wild animal or mixed use structure designed for other purposes which connected wild life from one side of the road to other. Researchers at the autonomous university of Madrid have analyzed 43 walk ways Used by vertebrate to quantitate the importance of these structures, which facilitate animal natural movement and reduce mortality caused by vehicle accidents.

Behavior studies and Analysis of patterns of the wild life activity along is required because some reptiles, butterflies, insects and amphibians are unreported due to lack of awareness of department due to negligence for small creatures which are usually treated as trivial incidence, but they are also a valuable part of ecological cycle of that area.

Wild life accidents monitoring system should be developed for reporting and tracing of guilty vehicle owners. Restricted entry should be there at probably wild life crossing time. Display the speed signage and identify the wildlife potential rich area where wildlife crossing and accident occurs frequently (Accident Prone Zone) and make speed breakers, wherever necessary. Awareness programs should be organized. Mitigating techniques should be applied strictly.

Summary and Conclusions

Components of the road in protected area can act as a barrier to movement and noise from the vehicle in traffic on road. Both conditions contribute barrier effects. Most animal are naturally afraid from traffic but all wild regularly cross the road as part of their movement between different habitats for various purposes [11].

Forman and Alexander [12] found that since 1970's road mortality has replaced hunting as major human induced cause of wildlife mortality, which is very similar to accident in national park and sanctuaries.

In 2001, a petition was filed regarding the proposed construction of a road through Corbett National Park in the State of Uttaranchal. This road involves cutting a huge number of trees, so WPSI suggested an alternative route that would partly use an existing road, skirting the Tiger Reserve. At a hearing in February 2003, the Indian Board for Wildlife unanimously stated that the sanctity of the Park needed to be protected and agreed that the road should skirt the Park and



Figure 1: (A) Comparative mortality rates of some wild animals in Pench Tiger reserve and Satpura Tiger reserve. (B) Graphs showing the comparative mortality rate of PTR & STR year wise.

pass through reserve forests in the neighboring state of Uttar Pradesh (UP). This would involve the Uttaranchal Government paying UP for compensatory afforestation. Uttaranchal agreed to this proposal and the two states are working out a strategy to construct the road in such a way that it serves public need with minimum damage to Corbett Tiger Reserve.

WPSI (Wild life protection society of India) filed a Public Interest Litigation (PIL) in the Rajasthan High Court in 2002, requesting closure of a section of State Highway No. 13 that runs through the Sariska Tiger Reserve in Rajasthan. This followed construction of a bypass skirting the reserve that was built in 1998 because large numbers of wild animals were being killed in road accidents on Highway 13. Despite the opening of the bypass, the highway has not been shut down and animals are continuing to be killed and the cases continue to be heard.

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