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Traffics and wildlife: A preliminary study on road-kill

(Arus Lalu Lintas dan Satwa Liar: Kajian awal pada Kematian Satwa di Jalan Raya)

Elly Lestari RUSTIATI

Department of Biology, College of Mathematics and Natural Sciences, University of Lampung. Jl. Soemantri Brojonegoro 1, Bandar Lampung 35145. Email: ely_jazdzyk@yahoo.com

***ABSTRAK*.** Makalahini membahas kematian satwa liar yang tertabrak di jalan raya dan jalan tol dengan metode survei pengamatan langsung. Satwa liar yang tercatat termasuk dalam mamalia berukuran sedang (2.50%, n = 1), burung (5.00%, n = 2), dan mamalia kecil (92.50%, n = 37). Mamalia kecil meliputi mamalia yang biasa ditemukan di area kejadian, tupai, raccoon, senggung dan tikus tanah. Pada kelompok mamalia tupai (35,00%) tercatat paling tinggi diikuti oleh tikus tanah (25%), tikus/clurut (17,50%), raccoon (10%), senggung (5,00%) dan kucing (2,50%). Adanya tumpang tindih antara habitat dan perilaku ekologis satwa liar dengan pembangunan jalan raya diduga menjadi penyebab kematian satwa.

Kata Kunci: kematian satwa di jalan raya, lalu lintas, satwa liar, burung, mamalia

***ABSTRACT*.** This paper presents the preliminary finding on road kill survey by direct observations on the high ways. The road-kills recorded of small wildlife, including medium size-mammal (2.50%, n = 1), birds (5.00%, n = 2) and small mammals (92.50%, n = 37). The small mammals include the most common mammals in the areas, squirrels, raccoons, skunks and woodchuck. Of mammals, squirrels (35.00%) were the highest recorded, followed by woodchucks (25.00%), mice/shrew (17.50%), raccoons (10.00%), skunk (5.00%) and domestic cat (2.50%) respectively. It seems road-kill was caused by conflict between the wildlife natural habitat as well as its ecological behavior and road development.

Keywords: road-kill, traffics, wildlife, birds, mammals

INTRODUCTION

Globally, human activities impact from one-third to one-half of the earth's land surface; a major component of development involves the construction of roads. The impact of roads on local biodiversity is a major issue associated with urbanization. As the development progresses, the welfare of wildlife surrounding may become one of concern, and expected its natural habitat is not highly affected the changes brought by human being (Bond and Jones, 2008).

Some incidents have been recorded. Kangaroo-vehicle collisions are frequent on Australian highways with the probability of a kangaroo-vehicle collision increased exponentially with traffic volume (Klocker *et al*.; 2006). In the US and Europe, road networks fragment normal animal movement patterns, reduce landscape permeability, and increase wildlife-vehicle collisions, often with serious wildlife population consequences (Bissonette and Adair, 2008). It may be considered as anthropogenic disturbances (Bond and Jones, 2008). Repeated counts of road-killed animals in New Zealand have revealed sites where possums (*Trichosurus vulpecula*), rabbits (*Oryctologus cuniculus*), hedgehogs (*Erinaceus europaeus*), gulls (*Larus dominicanus, L. novaehollandiae*) and shags (*Phalacrocorax carbo*) were killed in unusual numbers. Nonetheless, these "blackspots" were not correlated with the volume of traffic, but were mapped at or near places where animals are presumed to crowd together or were most likely to venture onto the road (Brockie, 2007). Black land crab (*Gecarcinus ruricola*) populations and their dependent catchery in the San Andres Archipelago, Colombia, are under threat from overexploitation, habitat loss and degradation, and road-kill during annual spawning migrations to the sea (Baine *et al*., 2007). Roads negatively

affect animal populations by presenting barriers to movement and gene flow by causing mortality (Row *et al.*, 2007). Seiler *et al.* (2004) suggested an overall increase in the frequency of road kills over the past 40 years, which partly can be attributed to changes in traffic volume and wildlife population sizes (game bags). Although vehicle-induced mortality of wildlife is well known on roads throughout Australia, few empirical studies describe the extent of this mortality or assess the potential effects on wildlife populations (Taylor and Goldingray, 2004).

Critically, the placement of wildlife crossing structures to restore landscape connectivity and reduce the number of wildlife-vehicle collisions has been proposed. In an attempt to minimize the impact of the larger road on local wildlife populations in Brisbane, Australia, for example, a range of fauna crossing structures were constructed at the site (Bond and Jones, 2008). The placement of wildlife crossings in North America, re-establish landscape permeability by facilitating wildlife movement across the roaded landscape and significantly improve road safety by reducing wildlife vehicle collisions (Bissonette and Adair, 2008). The FLASH(TM) (Flashing Light Animal Sensing Host, Victoria Gouch, Meridian, Id.) system, designed to detect deer presence on the highway and warn motorists by triggering flashing lights associated with a sign, was applied in Wyoming (Gordon *et al.*, 2004).
Steps toward addressing the roadless issue to protect last forest remain are tangled mess of wildlife-human conflicts. Intrusion like plans for logging, road building even clearcut within natural areas is around the clock. Long-term data on wildlife populations pertaining to road development are needed to elucidate the relative importance of extrinsic factors on population dynamics; however, such data are rare for most species such as small to medium-sized mammals. The aim of this preliminary project was to observe incidentally the roadkill along the highway/main road.

METHODS

Recording of road-kill was undertaken for three months, May-July 2008, during the spring and summer season, in New Hampshire and Massachusetts, and May-July 2009 in Lampung by direct observation of random driving along the main roads and highways of New Hampshire and Massachusetts. Most of the side of main roads and high ways are city park or forest which suitable as wildlife habitat. Another three months road-kill recording, May-July 2008, was conducted in Bandar Lampung in inter province road and main road vicinity to urban areas.

RESULT AND DISCUSSION

Seiler *et al.* (2004) suggested that road-kills in Swedish roads involved small to medium size mammals such as badgers *Meles meles),* hares (*Lepus spp),* moose (*Alces alces)*, roe deer (*Capreolus capreolus)*, badgers and red foxes (*Vulpes vulpes)*. The observation revealed the road-kill information on small wildlife, including medium size-mammal (2.50%, n = 1), birds (5.00%, n = 2) and small mammals (92.50%, n = 37) (Figure 1). The small mammals include squirrels, raccoons, skunks, woodchuck, and rodents, mammals commonly found in the areas. Of mammals, squirrels (35.00%) were the most commonly recorded, followed by woodchucks (25.00%), mice/shrew (17.50%), raccoons (10.00%), skunk (5.00%) and domestic cat (2.50%) respectively.

There are some possible explanation for squirrels and woodchucks being the most frequent road-kill. Even though squirrels spend most of their time in trees, they come to the ground to find food. The high number of squirrel road kills may also be correlated with their mating period occurs during June and July. Furthermore, a number of squirrels are killed every year by automobiles on park roads. Whilst raccoon lives in wooded areas near water but it is very adaptable to human. They are found in suburbs and urban areas. The woodchuck is a semi fossorial occupant of forest borders, favoring the edge of brushy woodland, especially along fields, roads, and streams. And they are most active in early morning and late afternoon when the traffic is on peak hour.

Malo *et al*. (2004) stated that road sections with high wildlife collision rates were associated with areas having high forest cover, low crop cover, low numbers of buildings and high habitat diversity. Most of the wildlife findings were noted in areas with vegetation along the road. Whilst mice/shrew road-kill were observed in settlements vicinity. It may be correlated with the fact that these rodents were well adapted to human and known as domestic pest. The medium-size mammals observed in the settlement area was kitten which more look suffered from illness. Bird road-kills may be results from collisions. Orlowski (2005) revealed that bird mortality was also found in road network, in Poland.

It seems road-kill was caused by conflict between the wildlife natural habitat as well as its ecological behavior and road development plan. More studies are needed to earn more information supporting road development.

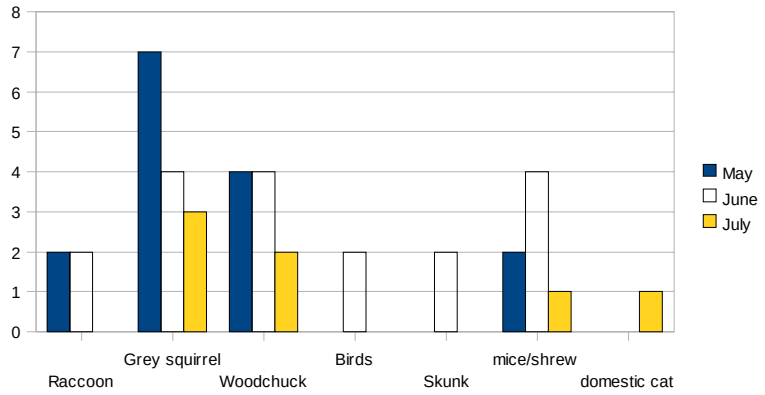

Figure 1. The presence of road kill

CONCLUSION

Roadkill recorded consist of small mammals, medium-size mammal and birds. The small mammals include squirrels, raccoons, skunks, woodchuck, and rodents, mammals commonly found in the areas. Of mammals, squirrels were the most commonly recorded, followed by woodchucks, mice/shrew, raccoons, skunk and domestic cat. Their ecological behavior and natural habitat may conflict with road development.

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