

Spatial and Temporal Evaluation of the Wildlife-Vehicle Collisions Along the M3 Highway in Hungary

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Among linear facilities highways have special significance, because the large-scale traffic and wildlife-fencing represent nearly total barrier effect for the wildlife. The data analyses of the road-kills are important since they enable us to choose the proper mitigation measures, both for traffic-safety and ecological aspects. Based on the road-kill database of the ÁAK Zrt. we evaluated the data of the period between 2002 and 2009 of the Hungarian M3 highway of four selected species that are large enough to cause a threat to traffic safety. These were the following: roe deer, wild boar, Eurasian badger and red fox. Our primary aim was to describe the spatial patterns of WVCs (wildlife-vehicle-collisions). Road-kill data were summarized in 500 meter long segments of the highway. We observed the relation and counted correlation between the frequency of WVCs and the local density of these species. In order to do so, we used the National Game Management Database as source of estimation data of the populations of the four wild species. We did not find any strong or significant correlation between road-kill frequencies and the estimated densities of the populations. As a temporal evaluation we analyzed the frequency of WVCs of each month (secondary aim). Kruskal-Wallis test and Dunn's post-hoc test were run as well. In each case, apart from the Eurasian badger, we found at least one month that differed significantly ($p < 0.05$) from the other months. May for the roe deer, September for the wild boar, and October for the red fox were the months with the highest road-kill frequency. Based on our results we believe that the frequencies of WVCs are not predominantly determined by the local density of the population. The differences in WVC frequencies during certain periods of time point at the most vulnerable periods in the life cycle of a given wild species.