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Wildlife road mortality in Mediterranean coastal wetlands (East Spain).

Key words: Wetlands, Wildlife, Road kill, Kernel, Predictive models

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Abstract

Roads have a great impact on the natural environment, especially when they have heavy traffic and go through valuable ecosystems like wetlands. We have studied wildlife casualties on different type of roads over three coastal wetlands in the Iberian Peninsula: Albufera, Marjal de Pegó-Oliva and Aiguamolls de l'Empordà Natural Park. The aim of this study was to determine the main species and species groups affected by wildlife-vehicle collision, to investigate the spatial pattern of these collisions and to identify the main factors involved in the presence of the fatalities. Eight different roads that cross Mediterranean wetland areas were monitored at least 10 times each season sampling on foot or by bicycle. All road casualties found were reported and the carcasses were removed to avoid double counting. Data analysis was performed using the SANET ver.4 Beta GIS based tool developed by Okabe *et al.*, (2008). This tool is used to estimate the mortality density distribution over a network using a Kernel Density Estimation (KDE). Predictive models of presence/absence data were constructed to determine the common explanatory factors associated with the location of casualties on the eight monitored roads. An important number of casualties were registered in all wetlands: 2008 in Albufera, 599 in Pegó and 2983 in Aiguamolls. Several threatened species were found dead on all these wetland roads such as some chiroptera like Mediterranean horseshoe bat (*Rhinolophus euryale*), and Schreibers' bat (*Miniopterus*

schreibersii). Also we registered great differences in the main groups affected by roads between wetlands. While in the Aiguamolls Natural Park the main group affected was amphibians, in the other two Natural Parks, birds were the main group. These differences are strongly correlated with the abundance of each group in the respective environments. Also other landscape and local variables show influence in the distribution of vertebrate road mortality. Otherwise the SANET tool has proved to be an interesting tool to determine the locations of hotspots, with easy application and shows results which are easy to interpret.

Comments on changes: The language and spelling of this abstract was checked with the help of a native English speaker. We have abridged the prologue and we have included specific methodology and results such as the main species groups affected by roads, the most threatened species found and number of road-kills.