Modeling the Propagation of Noise Pollution from Isfahan's West Ringway in Ghamishloo Wildlife Refuge Using SPreAD-GIS

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Abstract

The most common sources of environmental noise are human transportation systems which can have catastrophic effects on physiology and behavior of wildlife species. Spatial models of noise propagation from roads in ecological sensitive region could be very useful tools for prediction of roads impacts. The goal of our study was to apply a straightforward, accurate, and affordable approach for modeling noise impacts from Isfahan's west ringway, which passes through Ghamishloo wildlife refuge. We used the System for the Prediction of Acoustic Detectability noise model (SPreAD-GIS). For this study, land use map, meteorological data, topography map, and noise source characteristics were used as the model inputs. We compared the model results to wildlife occurrences to evaluate how noise effects could impact threatened animals. The key affected species of the study area Goitered gazelle (*Gazella subgutturosa*) and wild sheep (*Ovis orientalis isphahanica*), were considered for impact analysis. The results showed that in the areas with noise intensity lower that 20 db the animal has no actions and the area is known as "calm area", however the areas with noise intensity higher than 20 db is as "disturbance and action" area. The comparison of the results of both species showed that the results vary based on their habitat and behavior, and we found the higher noise impacts on distribution of *Goitered gazelle* in the study area.

Keywords: Noise pollution, Modeling, Road, Ghamishloo, Wildlife refuge.

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