

# Modeling the spatial distribution of wolf (*Canis lupus pallipes*) attacks on human using genetic algorithm (GARP) in Hamedan province

N. Behdarvand<sup>1\*</sup>, M. Kaboli<sup>2</sup>, R. Ebrahimpour<sup>3</sup>, B. Jabbarian Amiri<sup>3</sup>

1. Msc student, Department of Environmental Sciences, Faculty of Natural Resources, University of Tehran, I. R. Iran

\*Corresponding author: E-mail: [n.behdarvand@yahoo.com](mailto:n.behdarvand@yahoo.com)

2. Assistant Professor, Department of Environmental Sciences, Faculty of Natural Resources, University of Tehran, I. R. Iran

3. Assistant Professor, Department of Electrical and Computer Engineering, Shahid Rajaee Teacher Training University, I. R. Iran

## Abstract

In recent decades due to steady human population growth coupled with increased use of resources and habitat degradation, conflicts between humans and carnivores have greatly been expanded. In order to mitigate these conflicts based on a clear understanding of conflict patterns, applying the species distribution models as helpful methods has been suggested. Occurring the recent conflict between wolves and local communities in Hamedan province is a clear case of this problem. In this study, capabilities of the genetic algorithm (GARP) were assessed in the modeling spatial distribution of wolf attacks in Hamedan province during 2006-2012. The area under the receiver operating characteristic curve (ROC) was used to evaluate performance of the model. Findings indicated that the applied modeling approach has a very good performance (area under curve =0.856) in predicting the spatial distribution of wolf attacks on humans. In addition, based on the results of sensitivity analysis, land-cover type, human population density and distance from main road were the most effective parameters. Findings of the present study can be applied in formulation of an adaptive management plan for wolf conservation and mitigation of the conflicts with local communities.

**Key words:** Hamedan province, human-wolf conflict, genetic algorithm for rule-set prediction (GARP), modeling distribution attacks.