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PII: S1617-1381(17)30393-X
DOI: https://doi.org/10.1016/j.jnc.2018.04.005
Reference: JNC 25638

To appear in:

Received date: 16-9-2017
Revised date: 2-2-2018
Accepted date: 19-4-2018

Please cite this article as: Meinecke L, Soofi M, Riechers M, Khorozyan I, Hosseini H, Schwarze S, Waltert M, Crop variety and prey richness affect spatial patterns of human-wildlife conflicts in Iran's Hyrcanian forests, *Journal for Nature Conservation* (2010), https://doi.org/10.1016/j.jnc.2018.04.005

Crop variety and prey richness affect spatial patterns of human-wildlife conflicts in Iran's Hyrcanian forests

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Abstract

Human-wildlife conflicts are a growing problem in Iran and pose a notable challenge to conservation efforts in its Hyrcanian forest region. We surveyed 162 households in 45 villages at six study sites to understand species-specific patterns of human-wildlife conflicts and people's reactions to these conflicts, and to suggest appropriate conflict mitigation measures. By using generalized linear and generalized linear mixed models, we analysed socio-economic and ecological variables to find key determinants of the main conflict types around seven species of mammals. We also incorporated prey richness data (i.e. red deer, roe deer and wild boar) in our models. Wild boar (*Sus scrofa*) and grey wolf (*Canis lupus)* were found to be the primary conflict species in regard to reported levels of severity; and crop loss by wild boars was reported by 97% of households. Logistic regression shows that these conflicts were positively influenced by the variety of cultivated crop species and the size of land under cultivation. Generalized linear mixed models show that human-wild boar conflicts increased in areas with lower human density, vegetation cover and distance to protected areas. Wolf conflicts were most frequently in the form of sheep attacks (81%) compared to goat (11%) and cattle (8%) attacks. Data shows that the attacks were positively influenced by village and landscape elevation and increased in areas with lower prey richness and those located closer to, or inside, protected areas. Several cost-effective mitigation measures should be used complementarily according to their effectiveness. These include avoiding planting of palatable seasonal crops near protected areas and establishing physical barriers around crop fields to lower large-scale crop damage by wild boars. To reduce livestock predation by wolf, it will be essential to address the restoration of the wild prey community and efficiency of animal husbandry practices.

Keywords crop damage · livestock depredation · mitigation · protected areas · conservation measures · Iran