Machine Learning Based Modelling of Human Panther Interactions in Aravalli Hills of Southern Rajasthan

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Abstract: Conserving keystone species of any ecosystem requires scientific knowledge of their habitat and interaction amongst wildlife especially the top predators. The wildlife managers are facing problems in the protection and conservation of the Indian Panthers due to continuous habitat loss and reduction in prey base. Modelling their habitat with certain parameters may provide better chances to protect and conserve Indian panthers in their natural habitat. In present study, habitat model is developed for Udaipur Wildlife (UW), Udaipur North UN) and Udaipur South (US) protected forest areas which include three wildlife sanctuaries to study different parameters related to habitat. It was observed that Random Forest Regression (RFR) is suitable where it is desired to predict the number of conflicts in a specific region given the type of conflict and other data (R^2 = 0.888). Only for US region, Decision Tree Regression (DTR) proved to be better predictor (R^2=0.897). The performance is derived from R^2 value between the actual and predicted value. Similarly, where it is desired to identify the number of major and minor mining leases given respective mining area and other data DTR outperforms RFR with better R^2 value (0.980). Machine learning is a branch of Artificial Intelligence (AI) which is used to study and develop system behaviour model. Machine learning modelling techniques used to design models which can be further predict vital system parameters with regards to Indian panther ecosystem. Present study supports further modelling of habitats of same kind of species via sample data management.

Keywords: Machine learning, Decision tree regression, Random forest regression, Indian panther, Wildlife conflicts.