

ABSTRACT

Species distribution models use species occurrence data and environmental variables to estimate species-habitat relationships and predict potentially suitable habitat. This research analyzes the usefulness of a maximum entropy model, Maxent, for estimating species occurrences and environmental predictor variables for *Hydromantes shastae*, a rare species of salamander with a small geographic extent and limited occurrence records. Environmental variables included elevation, geology, land cover, precipitation, and soils. Seventy-five percent of the presence data was used to train the model and the remaining 25% was used for testing. Model performance was measured by area under the Receiver Operating Characteristics (ROC) curve (AUC). The AUC of 0.879 indicated that the model performed substantially better than a random prediction. The log loss plot indicated that soils contributed most to model fit. These results indicate Maxent's effectiveness for identifying potentially suitable habitat for *H. shastae* and predicting potential species occurrences. This model can be used to support species impact analyses and conservation efforts. Further, this model could be enhanced to focus surveys for populations in new areas and predict species responses to altered environmental conditions.