ABSTRACT

Strix occidentalis lucida (Mexican spotted owl) is a threatened wildlife species under the provisions of the Endangered Species Act (ESA) and in recent years Gila National Forest (GNF), New Mexico has been a vital stronghold in providing suitable habitat for remaining owl populations. Historical point call survey data provided by the U.S. Forest Service (USFS) was processed to generate 405 presence points, which were used to generate 405 pseudo-absences. For modeling purposes, 75% of the 405 presence and absence points were used for training habitat suitability models and 25% were set aside for validation. Maxent and logistic regression were the methods selected for modeling Mexican spotted owl habitat suitability. Several topographic, water resource, vegetative, and climatic environmental variables were selected as the potential environmental predictors. A stepwise Maxent model included the variables land surface temperature low pass (lst low), elevation, and stream proximity (sprox), resulting in a validation kappa of 0.370 and AUC of 0.777. The best logistic regression model consisted of lst low, elevation, stream proximity, modified soil adjusted vegetation index (msavi), and slope as the environmental variables with a validation kappa of 0.267 and AUC of 0.750. Maxent and logistic regression habitat suitability models had poor agreement when assessed using the habitat suitability classes; however, they agreed substantially when comparing total suitable habitat with a kappa of 0.655. The habitat suitability models both performed well, gave similar accuracies, and may possibly aid future Mexican spotted owl surveys within GNF.