

ABSTRACT

The greater sage-grouse is a very important species in the sagebrush landscape of the western U.S. The number of sage-grouse has declined due to habitat loss. This study charts the distribution of the greater sage-grouse in the Powder River Basin in northeastern Wyoming using the maximum entropy model MAXENT. The MAXENT model used variables important to the greater sage-grouse to create rasters that emphasized suitable habitat in Campbell and Converse counties. The first model used two biophysical factors (to mimic landscape suitability in the absence of people) and the second model used seven additional layers of distance to primary and secondary roads, gas processing facilities, power lines, pipelines, coal mines, and wells. The overarching goal was to document the impact humans have on the greater sage-grouse's habitat. Greater sage-grouse data has been collected since 1948 and these observations were used to develop the final models. The performance or accuracy of the model was based on the Receiving Operating Curve (ROC) and the Area Under the Curve (AUC) using 15 replicates of both models. Both of the models were able to predict the species distribution and achieved a rating of average in terms of performance. The two suitability maps produced by MAXENT highlight where the most acceptable habitats are located within the Powder River Basin. This is based on the environmental layers that were entered into MAXENT. The output can give researchers ideas of where best to place their conservation efforts for the greater sage-grouse. The greater sage-grouse is an important species because it is only found in North America and a small part of Canada. It is considered an umbrella species, meaning other species depend on its survival. The conservation of this species will benefit many other species that consider the 'sagebrush sea' their home.