Abstract

Understanding spatial and temporal change in distribution of endangered species within urban, fragmented landscapes has increased as an area of ecological study in the last fifty years in concert with improvement of environmental protection regulations. This research involves designing a species distribution model for Pacific pocket mouse (*Perognathus longimembrus pacificus*; PPM) to generate predictions about their habitat use. The main goal was to understand the relationship between distinct occurrence locations and environmental variables within a 0.12-km^2 Habitat Conservation Area in May 2009 for later spatio-temporal comparison. Environmental variable layers were generated using supervised classification of Digital Globe's WorldView-2 high-resolution satellite imagery, in addition to other vegetation health measures and topography. A model was developed using the open source software program Maxent to spatially represent the distribution of PPM and the variables that may have influenced their presence. Results indicated that distance to houses and anthropogenic infrastructure strongly influences PPM distribution. Proximity to California sagebrush (*Artemisia californica*) and buckwheat (*Eriogonum fasciculatum*) show a positive relationship with PPM occurrence. Another strong positive influence on PPM presence was proximity to a recreational trail, which indicates that a level of moderate disturbance may benefit the species. This thesis presents the idea that appropriate habitat disturbance may be necessary to improve the spatial distribution of the PPM, and suggests ideas for further research to enhance understanding of human and environmental impacts to the species.