

Abstract

Within the United States, wind energy has a steady growth rate, with an estimated installed capacity of 95-million mega-watts as of 2018. Despite the benefits associated with wind energy, there are negative impacts from wind energy facilities to avian species, ranging from collisions with site infrastructure and electrocution to habitat conversion. Golden eagles (*Aquila chrysaetos*) are one of the most studied species, in regards to wind energy expansion, due to their federally protected status and sensitivity to decreases in population numbers from anthropogenic sources. Studies have evaluated how golden eagles use their environments in order to better understand the conditions that result in increased fatality rates. This study evaluated the effect of prey distribution on non-adult golden eagles' resource selection and used spatiotemporal pattern mining tools to evaluate patterns of habitat use at the Altamont Pass Wind Resource Area (Altamont).

To evaluate the relationship between California ground squirrels (*Otospermophilus beecheyi*) and golden eagles, a species distribution model (SDM) was developed in Maxent for ground squirrels using burrow distribution as a proxy to estimate the ground squirrel distribution at the Altamont. The SDM output had good predictive capacity and was used in a resource selection function (RSF) model in R to evaluate if ground squirrel distribution affected resource selection of non-adult golden eagles. The resulting RSF model performed poorly, thus the influence of ground squirrel distribution on non-adult golden eagle resource selection remains largely unknown. Telemetry data was then analyzed using spatiotemporal hot spot analyses to identify patterns of use over space and time in ArcGIS Pro. Despite the inconclusive RSF model results, space-time pattern mining identified the hot spots of eagle activity within the Altamont, which could be a starting point for future analyses.