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Bird Use of Solar Arrays at Airports

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ABSTRACT: The U.S. Federal Aviation Administration recently published guidelines for new solar array installations at airports and several airports have installed solar arrays on their properties. Although an increased reliance on solar energy will likely benefit airports from environmental and economic perspectives, it is unclear how solar arrays, which provide perches and shade, might affect bird use of airport properties. Before wide-scale establishment of solar arrays at airports, they should be studied to determine whether such changes in land use adversely affect aviation safety by increasing risk of bird-aircraft collisions. We studied bird use of five pairs of solar arrays and nearby airport grasslands in Arizona, Colorado, and Ohio over one year using 300-m walking bird survey transects surveyed 2-4 times per month from March 2011 through February 2012. Across locations, we observed 46 species of birds in airfield grasslands compared to 37 species in solar arrays. We calculated a bird hazard index (BHI) based on the mean seasonal mass of birds per area surveyed. General linear model analysis indicated that BHI was influenced by season, with greater BHI in summer than fall and winter. We found no effect of treatment (solar arrays vs. airfields), location, or interactions among predictors. However, using a nonparametric two-group test across all seasons and locations, we found greater BHI in airfield grasslands than solar arrays for those species considered especially hazardous to aircraft (species >1.125 kg). Our study supports the view that solar development is generally detrimental to wildlife at the local scale and the apparent negative effects of solar energy development on bird communities could hamper efforts aimed at reconciling increases in alternative energy production with wildlife conservation. However, the relative lack of bird use of solar arrays should facilitate solar development at airports, especially in regions where solar development is most promising. Even so, our observations suggested that birds used solar arrays in summer, and to a lesser degree in spring, for shade and perches; thus, biologists and others charged with wildlife management at airports should monitor bird activity at solar arrays at times when shade and perches are most important to birds.

Key Words: bird-aircraft collisions, bird-hazard index, solar array, perches

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