Abstract

Millions of birds are killed every year during their annual migration by colliding with tall communication towers and buildings. The goal of this study is to identify areas of specific concern for avian species during migration by modeling potential migration corridors for Red-eyed Vireo (*Vireo olivaceus*), Kirtland's Warbler (*Setophaga kirtlandii*), and Golden-cheeked Warbler (*Setophaga chrysoparia*) as a case study. These avian species perform transcontinental migrations each year. This study uses a least accumulated-cost analysis to predict probability of use of routes between winter and summer ranges by analyzing the presumed energetic cost of changing altitude (in response to topographic relief), traversing large bodies of water, and compensating for wind. Previous descriptions of migration pathways depict straight lines that do not take into account geographic barriers. This study compares the results of existing methods to the least accumulative cost model. The completion of the analysis on Red-eyed Vireo allows the same analysis to be performed on two more rare species, the Kirtland's Warbler and the Golden-cheeked Warbler. The results of this study show that least accumulated cost analyses are a viable option to assisting in determining preferred migration routes for migratory birds. Least accumulated-cost analyses demand significant computing resources, which can prevent studies of this size from being performed. Advances in technology now enable studies of this magnitude to be performed and this study is a proof-of-concept to illustrate the potential benefits of integrating these analyses into conservation planning.