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Modeling and analysis of avian populations vulnerable to wind energy.

Alternative energy sources such as solar and wind hold the potential to produce electricity without burning fossil fuels. These energy sources offer the advantage of decreasing greenhouse gas emissions and other types of pollution when compared to energy produced from fossil fuels. Because of this, the U.S. has placed a high priority on generating electricity from wind turbines. Despite these benefits, wind energy development may incur environmental costs such as wildlife (e.g avian) mortality. Species may be vulnerable to mortality because of both collision risk and their unique life history. In this talk we present a general branching process model for the risk of extinction for various avian populations as a function of the “take” associated with various levels of wind energy infrastructure and life history. We show that, expectedly, an increase in wind energy infrastructure increases the extinction risk of a given population. Additionally, we show that an increase in time-to-reproduction also increases the extinction risk of a given population. We explore the implications of these results from the perspective of biological conservation. (Received August 20, 2014)