Thelander, C.G., K.S. Smallwood, and L. Rugge. 2003. Bird Risk Behaviors and Fatalities at the Altamont Pass Wind Resource Area. Period of Performance: March 1998–December 2000. National Renewable Energy Laboratory Report. http://www.nrel.gov/wind/pdfs/33829.pdf

Executive Summary: It has been documented that wind turbine operations at the Altamont Pass Wind Resource Area kill large numbers of birds of multiple species, including raptors. We initiated a study that integrates research on bird behaviors, raptor prey availability, turbine design, inter-turbine distribution, landscape attributes, and range management practices to explain the variation in avian mortality at two levels of analysis: the turbine and the string of turbines. We found that inter-specific differences in intensities of use of airspace within close proximity did not explain the variation in mortality among species. Some species, however, spent more time flying within 50 m of turbines than expected based on the area within this proximity zone, and they spent less time within 51-100 m or 101-300 m, indicating that these species were drawn into the lands near turbines for some reason(s).

Unique suites of attributes relate to mortality of each species, so species-specific analyses are required to understand the factors that underlie turbine-caused fatalities. We found that golden eagles are killed by turbines located in the canyons and that rock piles produced during preparation of the wind tower laydown areas related positively to eagle mortality, perhaps due to the use of these rock piles as cover by desert cottontails. The degree of clustering of pocket gophers around wind towers related positively to red-tailed hawk mortality, and the degree of clustering of gophers appeared to be greatest on steeper slopes into which laydown areas and access roads were cut, thereby producing increased lateral and vertical edge (which gophers prefer for constructing their burrow systems).

Tubular towers killed more red-tailed hawks and other raptors than would be expected from their numbers within our study area, and this pattern was even stronger for areas in which the tubular towers occurred on ridge tops and other landscape features that produced strong declivity winds. Rotor speed correlated positively with mortality, as did rotor height above the ground and rotor diameter. The windswept area of the turbine string, meaning the cumulative rotor-swept areas of all turbines in the string, correlated positively with mortality of several avian species. Factoring in the windswept area eliminated the effect of turbine position in the string, which some had thought to be an important factor for avian mortality, and which was verified by our data prior to factoring in the windswept area. Raptor fatalities did not correspond well with the distribution of California ground squirrels. Other similar relationships between fatalities and environmental factors are identified and discussed. The tasks remaining to complete the project are summarized.