

Smallwood, K.S., C.G. Thelander, M.L. Morrison, and L.M. Ruge. 2007. Burrowing Owl Mortality in the Altamont Pass Wind Resource Area. *Journal of Wildlife Management* 71:1513-1524.

Abstract: We estimated wind turbines in the Altamont Pass Wind Resource Area (APWRA), California, USA, kill >100 burrowing owls (*Athene cunicularia hypugaea*) annually, or about the same number likely nesting in the APWRA. Turbine-caused mortality was up to 12 times greater in areas of rodent control, where flights close to the rotor plane were disproportionately more common and fatalities twice as frequent as expected. Mortality was highest during January through March. Burrowing owls flew within 50 m of turbines about 10 times longer than expected, and they flew close to wind turbines disproportionately longer within the sparsest turbine fields, by turbines on tubular towers, at the edges of gaps in the turbine row, in canyons, and at lower elevations. They perched, flew close to operating turbine blades, and collided disproportionately more often at turbines with the most cattle dung within 20 m, with the highest densities of ground squirrel (*Spermophilus beecheyi*) burrow systems within 15 m, and with burrowing owl burrows located within 90 m of turbines. A model of relative collision threat predicted 29% of the 4,074 turbines in our sample to be more dangerous, and these killed 71% of the burrowing owls in our sample. This model can help select the most dangerous turbines for shutdown or relocation. All turbines in the APWRA could be shut down and blades locked during winter, when 35% of the burrowing owls were killed but only 14% of the annual electricity was generated. Terminating rodent control and installing flight diverters at the ends of turbine rows might also reduce burrowing owl mortality, as might replacing turbines with new-generation turbines mounted on taller towers.