

Golden Eagle Fatalities and Relative Abundance in the Altamont Pass Wind Resource Area – Implications for Population Modeling

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Introduction

The Altamont pass Wind Resource Area (APWRA, Figure 1) is one of the largest wind farms in the Country and has been the focus of considerable attention due to the large number of golden eagles killed each year in turbine collisions. Operators have implemented management actions to reduce the number of golden eagle fatalities including a winter shutdown of turbines, the removal of “hazardous” turbines, and repowering smaller old-generation turbines. The purpose of our analysis was to evaluate the efficacy of management actions, and to explore the implications for modeling

Approach and Methodology

We estimated the APWRA-wide annual number of golden eagle fatalities from September 2005 through September 2011 by searching approximately 50% of the turbines in the APWRA every 30-35 days during the first 4 years, and approximately 33% of the turbines during the last year of the study (ICF, 2012). We estimated relative abundance of golden eagles by measuring the number golden eagle observations of per minute per cubic kilometer at 77 observation points across the APWRA. We evaluated the implications for population modeling by applying the observed change in fatalities to a Moffett’s Equilibrium model developed for golden eagles (Hunt, 1998). Based on the existing conceptual model for turbine related impact assessments (Figure 2) we modeled the influence of decreased fatalities at various sizes of breeding populations, ranging from the Bird Conservation Region (~800 breeding birds) to the local level (~100 breeders). On 30 year abundances.

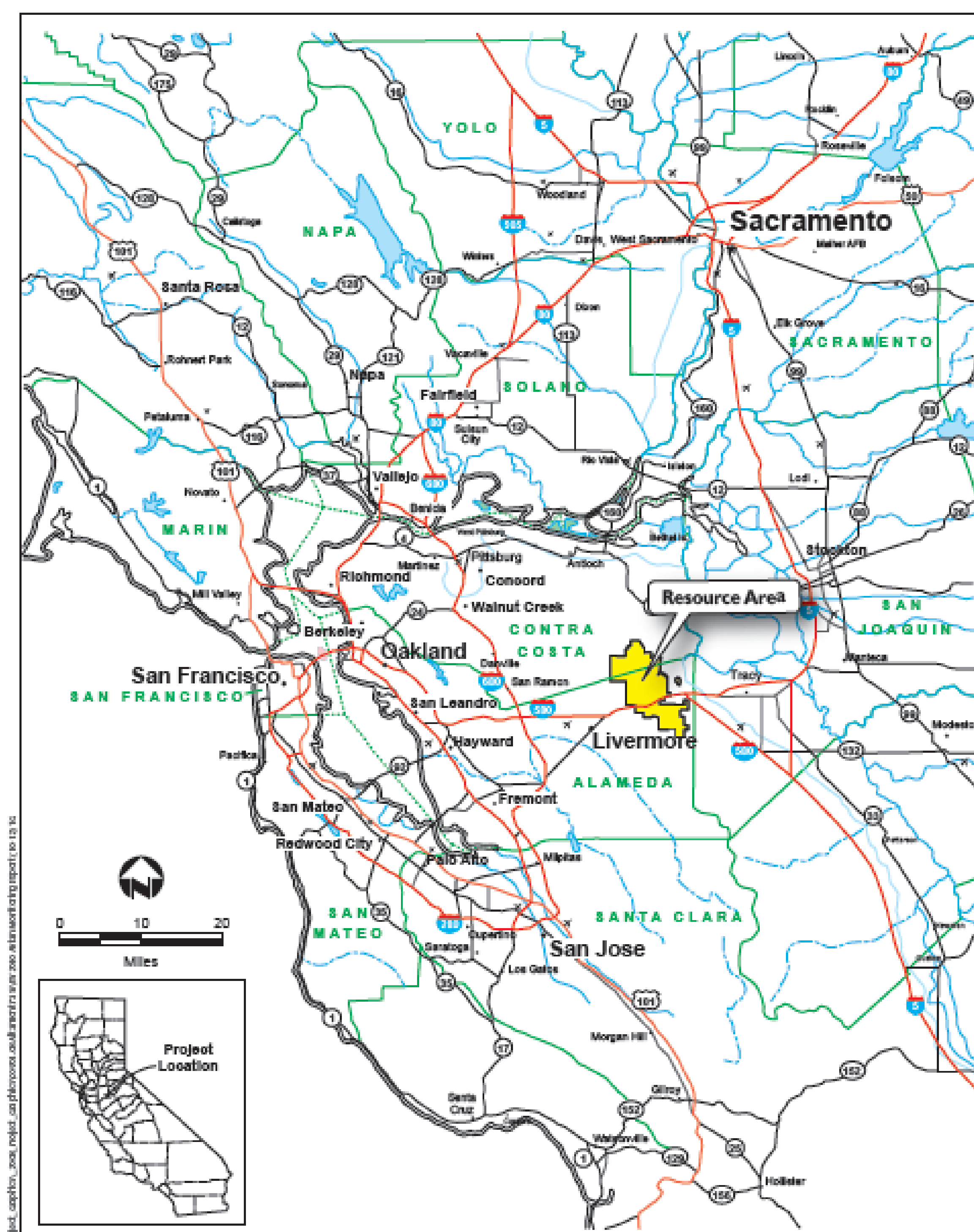


Figure 1. General location of the Altamont Pass Wind Resource Area

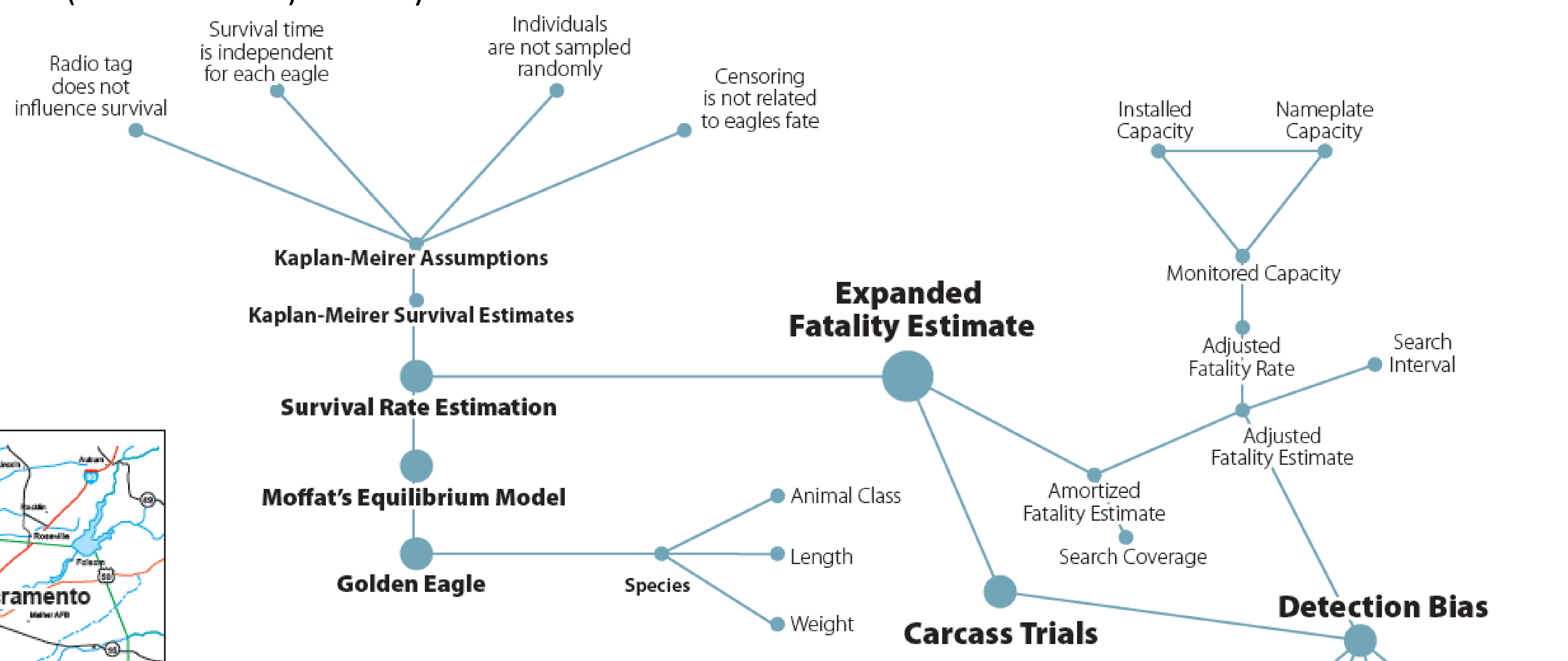


Figure 2. Conceptual model of golden eagle impact assessment

Results and Conclusions

Golden eagle fatalities decreased over the past six years from an average of ~64 per year to ~36 per year (Figure 3). The influence of this decreased fatality rate on population survival is related to the assumed size of the breeding population (local versus regional) that is influenced by APWRA fatalities (Figure 4). At previously published rates of survival we found a decreasing affect of improved survival with increases in the assumed breeding population size (Figure 5). A biologically defensible breeding population size must be determined before a robust assessment of impacts or future scenarios can be modeled for the APWRA.

Literature Cited

Hunt, W.Grainger. 1998. Raptor floaters at Moffat’s equilibrium. *Oikos* 82(1):191-197.

ICF International. 2012. Altamont Pass Wind Resource Area Bird Fatality Study, Bird Years 2005–2010. November. M87. (ICF 00904.08.) Sacramento, CA. Prepared for Alameda County Community Development Agency, Hayward, CA.

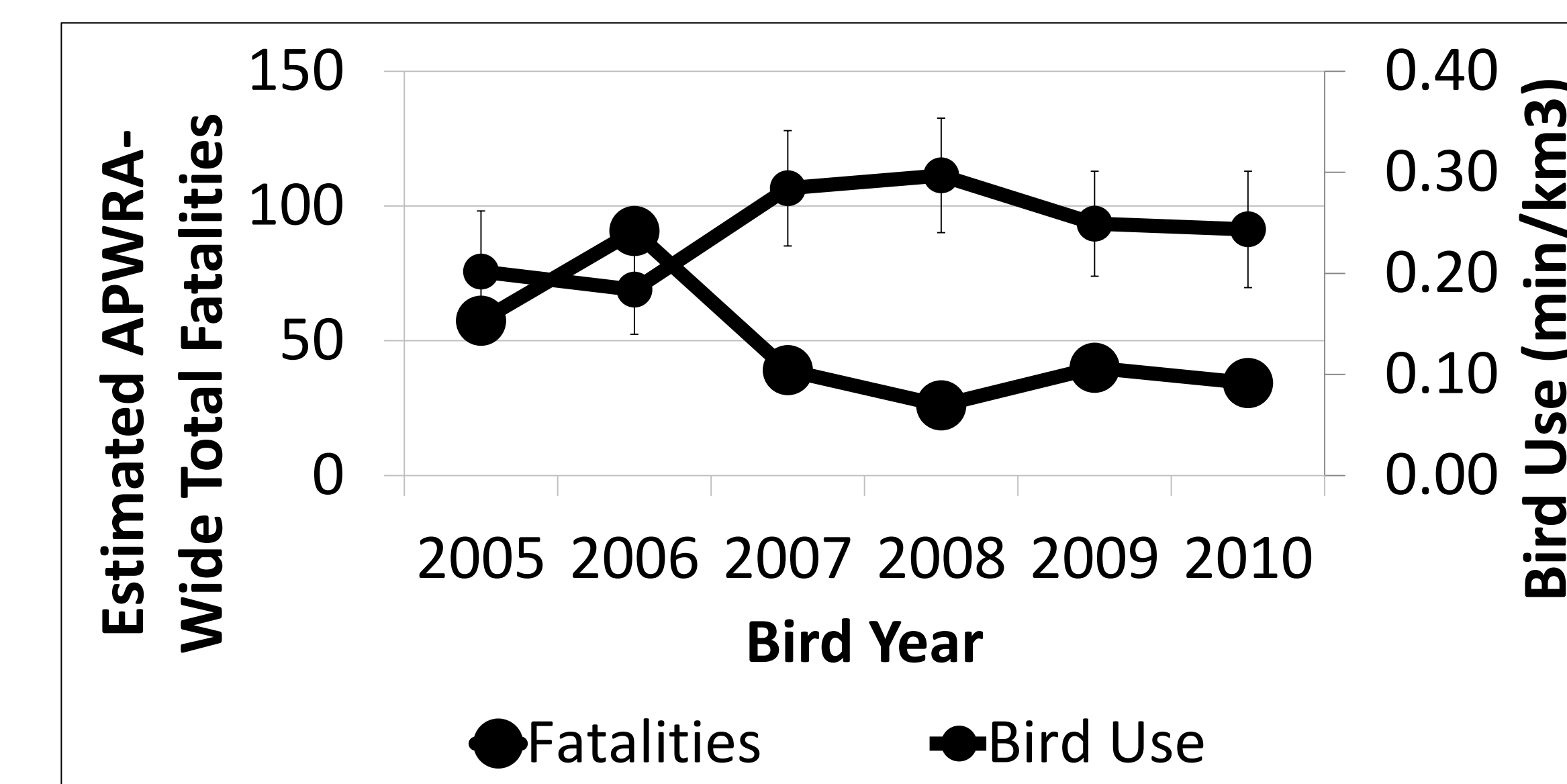


Figure 3. Golden eagle fatalities and relative abundance in the APWRA

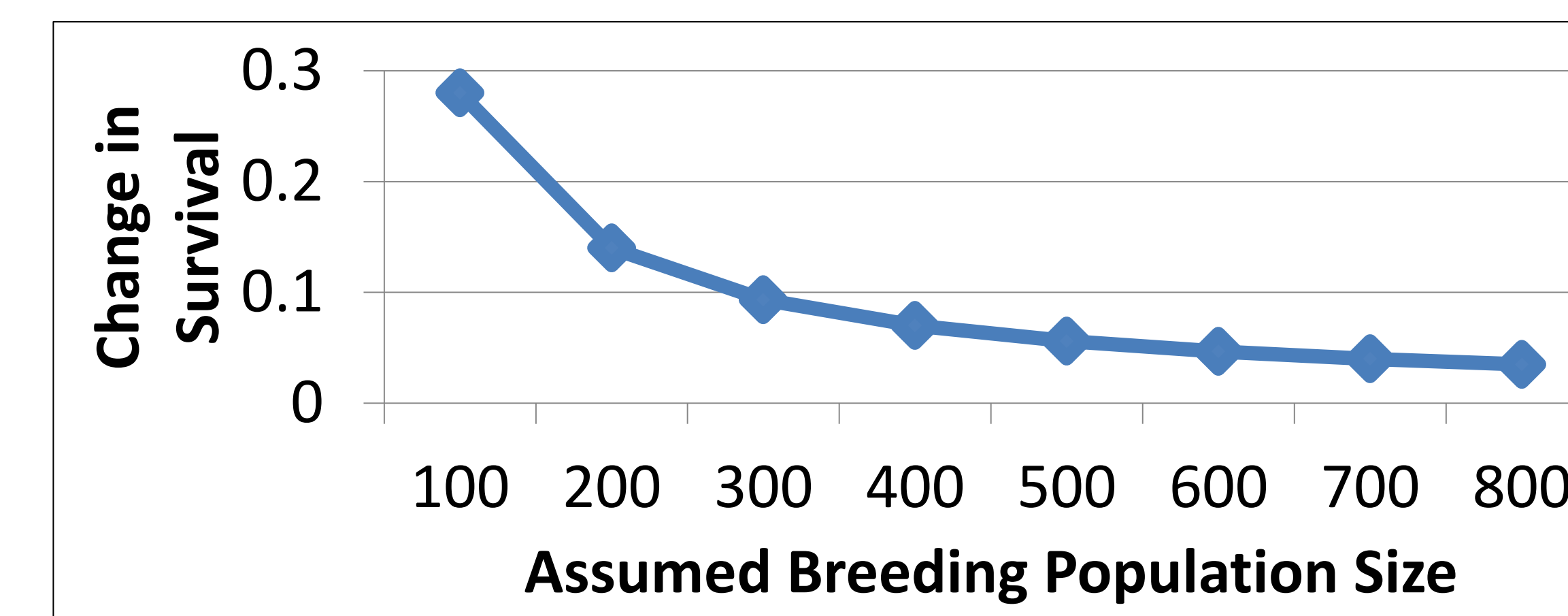


Figure 4. Change in survival versus assumed breeding population size influenced by the APWRA

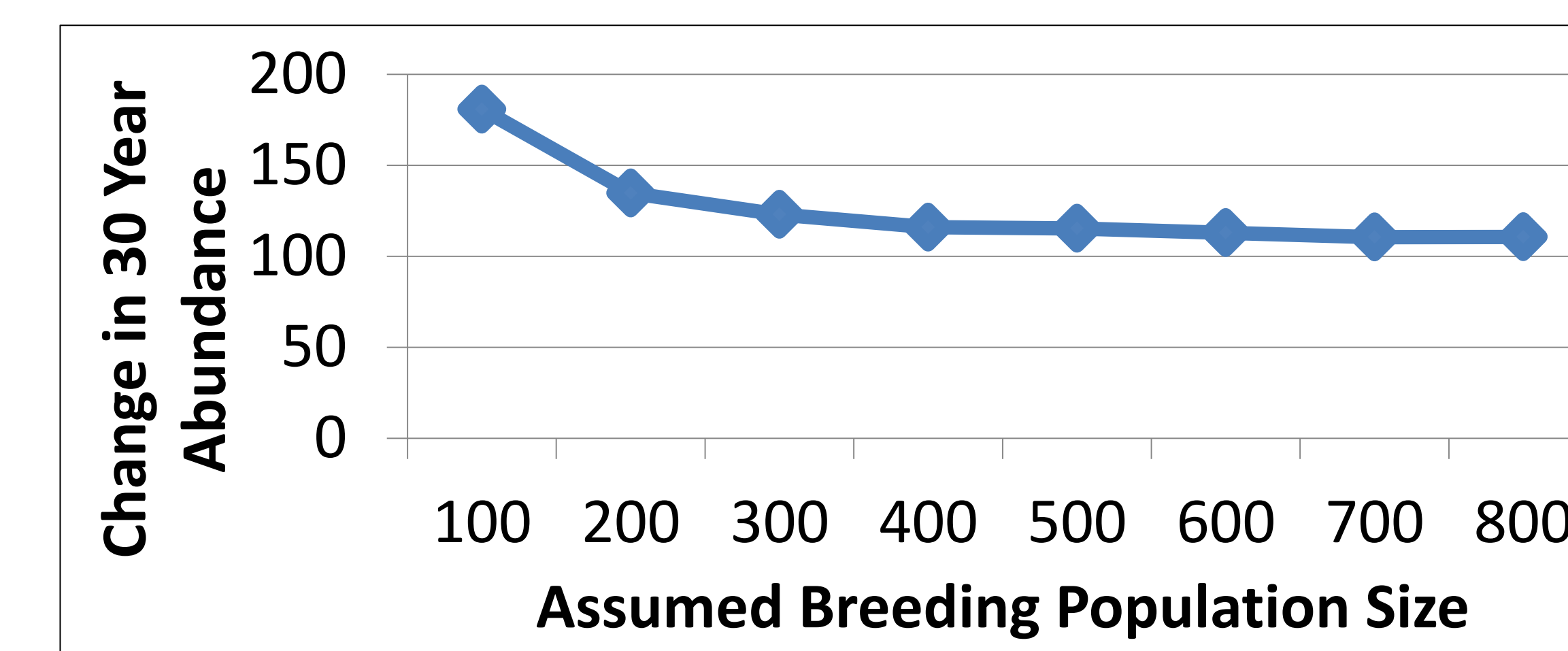


Figure 5. Change in abundance under baseline and current APWRA fatality rates assuming different breeding population sizes

Acknowledgments

Sandy Rivera , Alameda County
APWRA Scientific Review Committee
US Department of Energy Grant #EE0000525