Comparison of Area Correction Methods for Post-Construction Fatality Monitoring Studies

Paul Rabie, Western EcoSystems Technology, Inc. prabie@west-inc.com

Daniel Dalthorp, United States Geological Survey, ddalthorp@usgs.gov

Danny Riser-Espinoza, Western EcoSystems Technology, Inc. despinoza@west-inc.com

Jared Studyvin, Western EcoSystems Technology, Inc. jstudyvin@west-inc.com

Jerry Roppe, AVANGRID, Inc. jerry.roppe@iberdrolaren.com

Post construction fatality monitoring studies at wind facilities sometimes include plots that are incompletely searched. Plots may be incompletely searched for logistical reasons (e.g. rugged terrain) or as a cost-saving measure (e.g. searches confined to graveled road and turbine pad areas). Statistical methods to adjust fatality estimates to account for unsearched areas are available but only one such method (polynomial logistic regression) has been published, and its practical limitations are not fully known.

We present a second method (maximum likelihood estimation of density models for carcass distributions) to adjust fatality estimates for unsearched areas, and compare it to the polynomial logistic regression approach. Practical limits of the two methods that are explored, including minimum numbers of carcasses needed and minimum searched area needed to obtain reliable estimates. Additionally, data from several wind power generation facilities are analyzed to determine whether predictable patterns in carcass distribution emerge across turbine type, turbine size, carcass size, geographical location, or other turbine or carcass characteristics.

Preliminary results suggest that both methods can provide reliable area correction factors but each has its limitations and the best choice may be context-specific. Incompletely searched plots are a common feature of post-construction monitoring studies. They are in some cases unavoidable, and in many cases have been deemed acceptable by regulatory agencies. The results presented here provide important guidance on methods to obtain accurate fatality estimates when plots are incompletely searched.