



Department of Mathematics and Statistics

Joe Maurer

Oregon State University Doctoral Candidate,
NAU Alumni

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12:45-2:00pm, Adel Mathematics Bldg., Room 164

“Can we estimate fatality from carcasses observed only on roads and pads?”

Abstract: At wind energy farms birds and bats die from colliding with wind turbines. In order to better understand potential population effects to these animals there is a need to estimate the number of fatalities for a given wind project. In estimating bird and bat fatality at wind power facilities, we generally focus on two primary sources of imperfect detection: 1) carcasses are removed before sampling, and 2) carcasses present in the searched area are missed by observers. A third source that is often overlooked is that carcasses land in unsearched areas. We focus on this aspect to evaluate the potential for estimating total site fatality from carcasses observed on roads and pads. We consider three estimators: a ratio estimator (ratio), parametric model estimator (glm), and an empirical method (cake), all of which have been suggested in reports or in the peer-reviewed literature. Comparisons, through the use of simulations, are made considering different (1) per-turbine fatality rates, (2) distance distribution functions, and (3) anisotropic conditions. Preliminary results suggest the cake and glm methods may be preferred when rates are low as the ratio methods is biased and has relatively more variation. However, the ratio estimator may be preferred when rates are high and anisotropy is present but unaccounted for by the other methods. We discuss potential approaches to account for anisotropy in the three methods.