

Strategies for correlated covariates in distance sampling

D.L. Miller

Centre for Research into Ecological and Environmental Modelling
University of St. Andrews
St. Andrews Scotland KY16 9LZ
dave@ninepointeightone.net

Keywords: distance sampling

Abstract: Correlation between covariates in detection function models is an acknowledged but as yet unaddressed issue in the distance sampling literature. Covariates that affect detectability, such as search distance or sea state, are highly correlated with distance as well as each other. Inference drawn from models which contain highly correlated covariates may be spurious and such models may have optimisation issues. Variable selection and shrinkage methods for correlated covariates are well-covered topics in the linear modelling literature. Here methods commonly used in regression (such as ridge regression, lasso, principle components, etc) are explored for their utility in modelling detection functions. Particular attention is paid to the interpretability of resulting models.