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Tyler Brummer, Bruce Maxwell, and Lisa Rew

Using plant survey data: detection accuracy and implications for habitat modeling.

To effectively manage non-native plant species it is necessary to know where to look for populations to which the management will be applied. Complete inventories of the target species distribution are ideal but economic and logistical constraints prevent this approach as managers must work on such broad spatial scales. Thus, a subsample of the landscape can be surveyed and that data used to inform statistical models to provide predictions of the probability of occurrence of the target species across the whole area of interest. However, model accuracy depends on the quality of the initial data, thus detection accuracy of the raw survey data is important to understand when considering utility of the final models. Detection accuracy will likely alter throughout the season depending on a species germination time, growth habit and rate, and longevity both in terms of the individual species but also relative to the rest of the community. In this study, 17 non-indigenous species were surveyed along 2 kilometer long by 10 meter wide belt transects in the sagebrush steppe ecosystem of the Idaho National Laboratories, Idaho, USA. Fifteen of 106 transects completed over two seasons were randomly selected and repeated within the same season so that survey detection accuracy could be quantified. Overall error rates were positively associated with the species prevalence on the landscape as well as total number of patches. Gross error rates varied from 0.2% to 11.6% depending on species and factors highlighted above. We can use this information in a sampling simulation model to evaluate how these species specific error rates can influence the predicted probabilities of occurrence, and determine the amplitude of the influence this sampling error has on the final models delivered to managers.