IMBCR Improves Assessment Accuracy of Habitat Treatment Effects on Songbird Communities through Capacity to Address Imperfect Detection

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The small spatial scales and broad objectives of many habitat treatments warrant use of community metrics such as species richness, rank and dispersion to assess outcomes. Assessment of songbird communities, often a focus of monitoring due to broad knowledge of species-habitat relationships and established monitoring strategies, can be hampered by imperfect detection of species occurrence and relative abundance. We sought to understand whether and how adopting the protocol of a broader bird monitoring program, IMBCR (Integrated Monitoring of Bird Conservation Regions), could aid in addressing the effects of imperfect detection on the accuracy of different of community metrics. We addressed these questions using analysis of IMBCR data across six common land use types in Montana, and across a range of spatial scales representing the variety of sizes of habitat treatments commonly implemented. We found that leveraging the state-wide IMBCR monitoring dataset significantly improved the accuracy of community assessment by allowing us to correct for imperfect detection (otherwise impossible) at moderate to larger spatial scales. Additionally, we found that community dynamics at small spatial scales were sufficiently variable that correction for imperfect detection was less effective than increasing the spatial scale in improving assessment accuracy. The effect of imperfect detection of species on the accuracy of community metrics is best addressed through adjustments to survey protocol, and we provide insight in into how this differs across communities.