

FEATURE ARTICLES

HOW WELL DO CONSISTENTLY MONITORED BREEDING BIRD SURVEY ROUTES REPRESENT THE ENVIRONMENTS OF THE CONTERMINOUS UNITED STATES?

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Abstract. We investigated the degree to which consistently monitored Breeding Bird Survey (BBS) routes represented environmental conditions across the United States. Using 388 models of individual species distributions, we identified eight environmental variables to which birds were particularly sensitive. The nonproportional sampling of these variables would therefore have relatively large impacts on large-scale studies using BBS data. We then used a sampling grid to compare the distribution of these variables in grid cells with and without consistently surveyed BBS routes. We made comparisons nationally, within BBS-defined physiographic regions, and within U.S. states. Not surprisingly, given the geographic variation in the intensity of route coverage, areas with BBS routes differed from those without at a national scale. In general, higher elevations and drier climates were poorly represented by BBS routes, and northeastern deciduous forests were overrepresented. In contrast, we found few large differences within most BBS-defined physiographic regions and within most states. However, there were a few large differences in a small number of regions and states, many of which had relatively few BBS routes. We conclude that the weighting factors supplied by the BBS will likely address most differences in sampling densities at a national scale. However, for studies not using these weights, studies investigating specific subsets of the BBS data, and studies that include states with relatively few BBS routes, we strongly suggest resampling analyses to determine any bias incurred by uneven sampling and, if necessary, the subsequent development of study-specific weighting factors.

Key words: Breeding Bird Survey, elevation, northeastern deciduous forests, precipitation, predictive models, sampling, species abundance.