

AVIAN USE OF OPERATIONAL PHOTOVOLTAIC (PV) SOLAR FACILITIES IN NEW YORK AND WESTERN MASSACHUSETTS

Preliminary Results and Next Steps

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INTRO

Photovoltaic (PV) solar energy development in the northeastern U.S. is rapidly growing, and potential impacts of PV development on bird species associated with farmlands and early successional and forested habitats in the region are not well understood. There are currently no published studies that examine breeding bird communities associated with PV solar facilities in the region.

METHODS

We conducted 10-min, 50-m fixed radius point count surveys at 9 PV solar and 9 paired reference sites in NY and MA (Figure 1) from May 27 to July 25, 2021. Surveys were conducted 2-3 times at each facility and reference site. Vegetation measurements (e.g., height, density) on each survey visit were also collected to account for vegetation management regimes (e.g., mowing) and structure. For preliminary analysis, we used generalized linear models (GLMs) to infer relationships between vegetation structure (e.g., height) and species abundance.

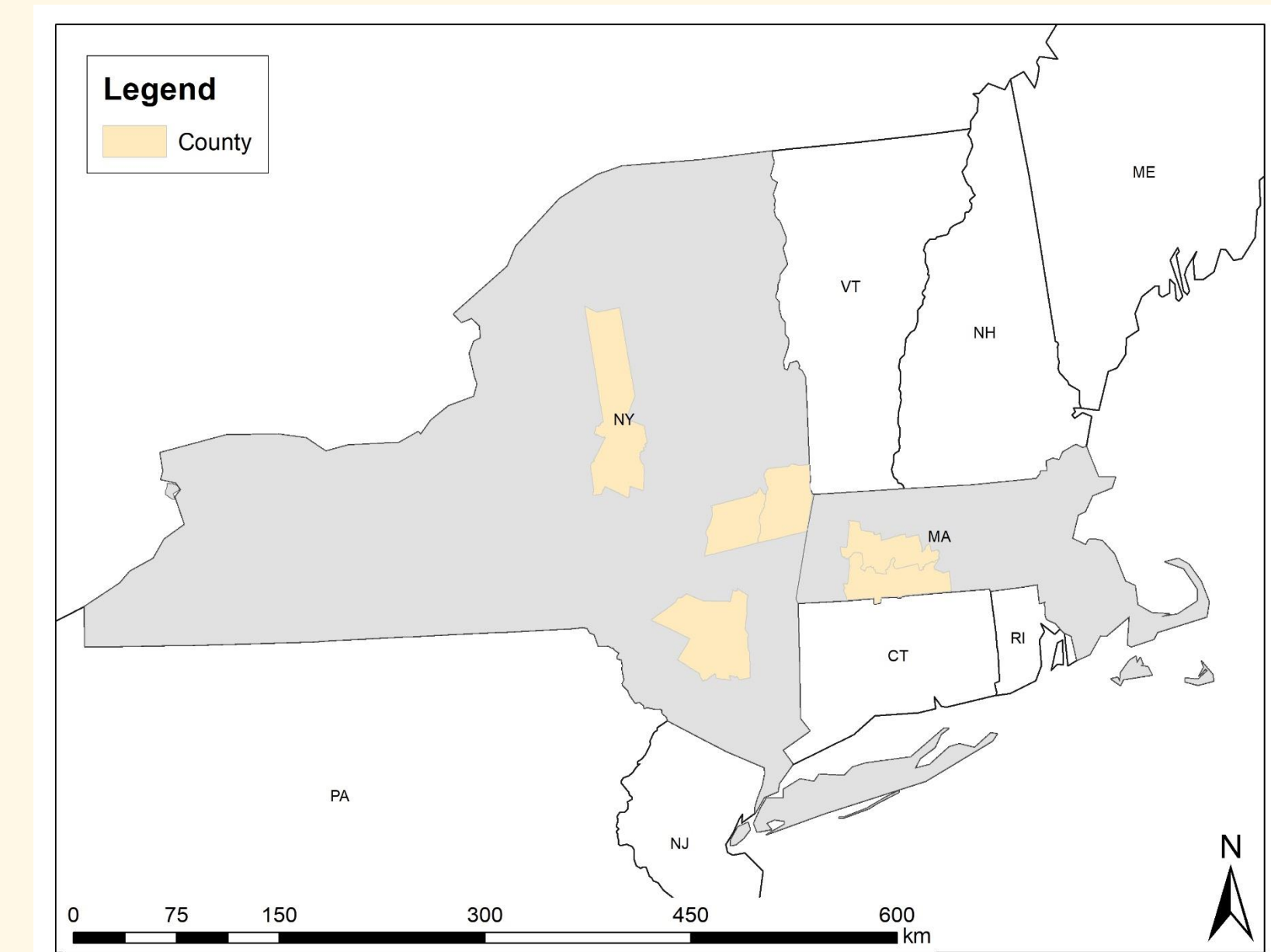


Figure 1. Study Area

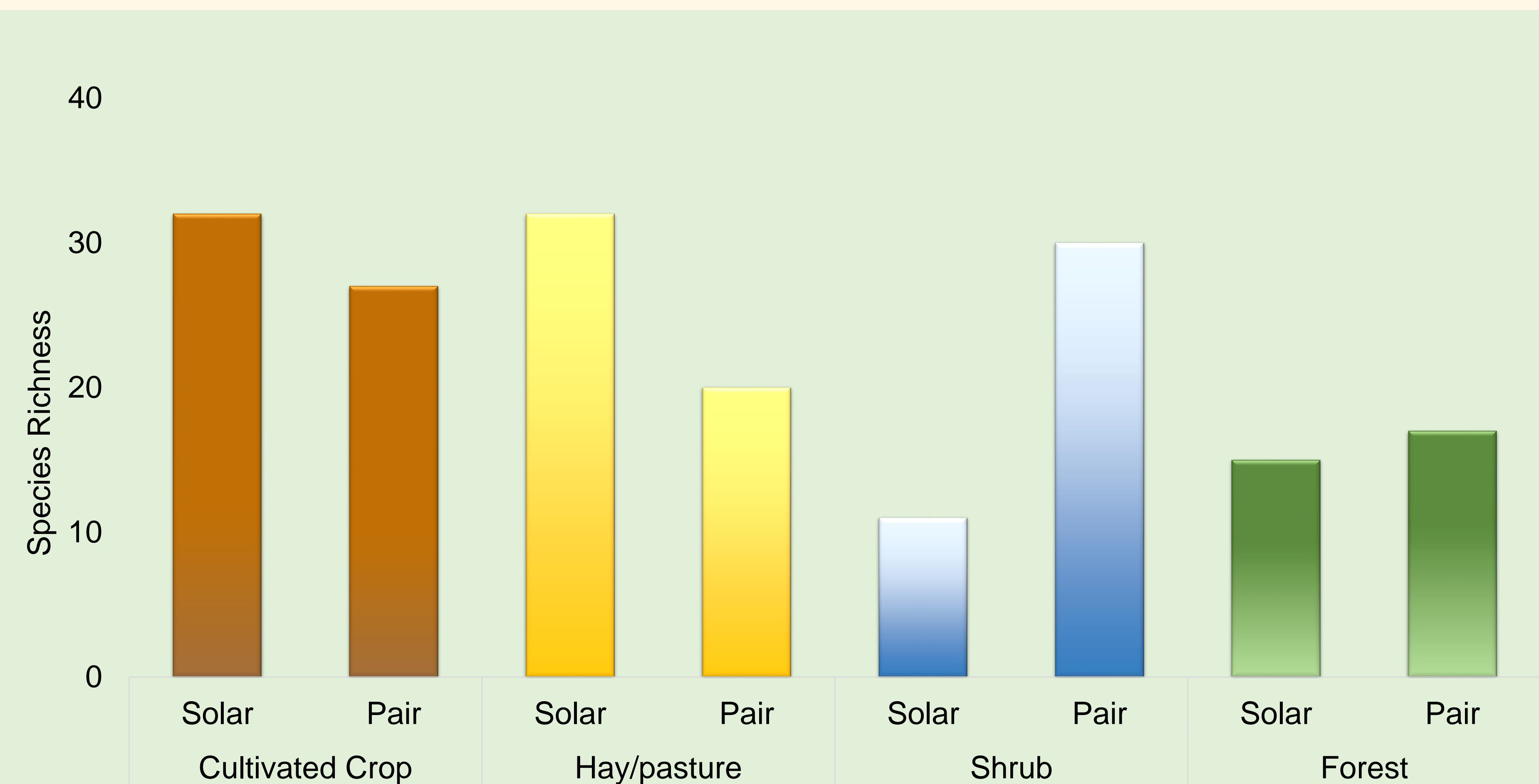


Figure 2. Species richness by land cover type.

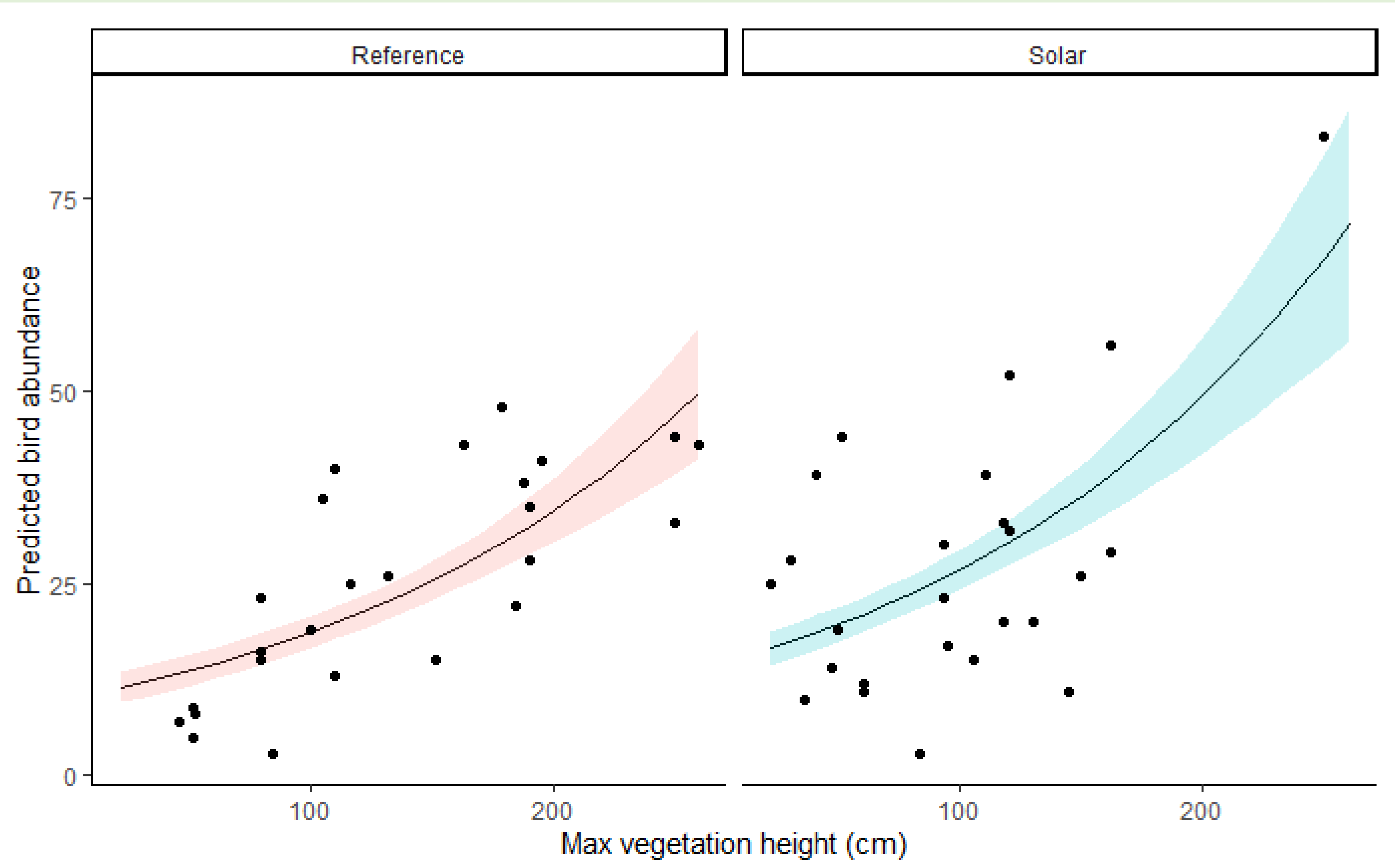


Figure 3. Bird abundance based on max vegetation height with actual observed data points.

RESULTS

Bird species richness was higher at PV solar facilities compared to paired reference sites in hay/pasture and cultivated crop fields, yet lower at solar sites in shrub habitats (Figure 2). Bird abundance increased as vegetation height increased (Figure 3). Preliminary results indicate that maximum vegetation height was the best predictor for species abundance. Additional analyses will include interactions among vegetation height, management regimes, and facility design features that were not accounted for in these preliminary analyses, as well as the potential influence of landscape-scale factors (e.g., distance to forest edge) that contribute to this relationship.

DISCUSSION

PV solar facilities appear to provide breeding habitat for bird species, as indicated by greater species richness in solar installations in crops as well as hay/pasture, although the opposite pattern was evident in shrublands. Future analyses will address the ecological factors associated with species richness and bird abundance at these sites, which will include vegetation variables, panel height and spacing, and landscape context. The results of these analyses can help inform site selection, spatial planning, and management of future solar energy developments in the region.



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