Appendix 1. Information about the study area, buffer sizes, explanatory variables, statistical analyses, how the interaction figure was produced, the within-scale interaction for the Yellow-breasted Chat, influential covariates, histograms and scatterplots for socioeconomic variables, and tables of statistics for AIC_c-based model selection and the best-supported regression models.

Study area

Our study area was within the Eastern Temperate Forest Ecoregion, which is a U.S. Environmental Protection Agency (EPA) Level I ecoregion in the eastern United States (Commission for Environmental Cooperation 1997, Omernik and Griffith 2014). Each Level III ecoregion is a distinct ecological division of the Level I and II ecoregions and presents opportunities for unique management strategies based on its physical and biological characteristics (Commission for Environmental Cooperation 1997). Each EPA Level I ecoregion is divided into several Level II ecoregions, and each Level II ecoregion is further divided into several Level III ecoregions. Our study area fell within four EPA Level II ecoregions (Central USA Plains, Southeastern USA Plains, Ozark Ouachita-Appalachian Forests, and Mississippi Alluvial and Southeast USA Costal Plains) and two to six EPA Level III ecoregions within the EPA Level II ecoregions.

Central Corn Belt Plains and Eastern Corn Belt Plains were two Level III ecoregions within the Central USA Plains Ecoregion; both are now mostly covered by agriculture (U.S. Environmental Protection Agency 2017a). The Central Corn Belt Plains Ecoregion once was mostly prairie intermixed with oak-hickory (*Quercus* spp. - *Carya* spp.) forests. The Eastern Corn Belt Plains was once dominated by beech (*Fagus* spp.) forests and elm-ash (*Ulmus* spp. – *Fraxinus* spp.) swamp forests (U.S. Environmental Protection Agency 2017a).

Six EPA Level III ecoregions (Northern Piedmont, Interior River Valleys and Hills, Interior Plateau, Piedmont, Southeastern Plains, and South Central Plains) were from within the Southeastern USA Plains Ecoregion. The vegetation of the Northern Piedmont Ecoregion includes oak forest, but now it is mostly covered by agriculture. Large parts of the Interior River Valleys and Hills Ecoregion are under agriculture (cropland and pasture), but valley slopes have mixed oak and oak-hickory forests, and lower elevations have bottomland deciduous forests and swamp forests. The Interior Plateau Ecoregion is primarily oak-hickory forest, with some prairie and glades. The Piedmont Ecoregion vegetation is primarily composed of pine (*Pinus* spp.) and hardwood; this region is rapidly being converted to urban and suburban areas. The Southeastern Plains Ecoregion has longleaf pine (*P. palustris*) forests, mixed forests, and agriculture. More than half of the South Central Plains Ecoregion is forest, and the ecoregion is populated mostly by loblolly (*P. taeda*) and shortleaf (*P. echinata*) pine plantations (U.S. Environmental Protection Agency 2017a).

Four EPA Level III ecoregions (Ridge and Valley, Western Allegheny Plateau, Blue Ridge, and Ozark Highlands) were from within the Ozark Ouachita-Appalachian Forests Ecoregion. Approximately half of the Ridge and Valley Ecoregion is under forest cover. Most of the Western Allegheny Plateau Ecoregion is under agriculture, but remaining forests are mainly mixed mesophytic and oak. The Blue Ridge Ecoregion consists of ridges, plateaus, and mountainous areas with forested slopes; most of the forests are composed of oak and northern hardwoods, but some spruce-fir (*Picea* spp. – *Abies* spp.) forests occur at higher elevations. The Ozark Highlands Ecoregion is generally forested with oak, but mixed forest of oak and pine also is present (U.S. Environmental Protection Agency 2017a).

Middle Atlantic Coastal Plain and Mississippi Alluvial Plain were the two EPA Level III Ecoregions within the Mississippi Alluvial and Southeast USA Costal Plains Ecoregion. The forest in the Middle Atlantic Coastal Plain Ecoregion consists mostly of loblolly and shortleaf pine. The forest in the Mississippi Alluvial Plain Ecoregion consists primarily of bottomland deciduous forest; much of this forest has now been converted to agriculture (U.S. Environmental Protection Agency 2017a).

Because we only included parts of the 14 EPA Level III ecoregions that were within the breeding ranges (BirdLife International and Handbook of the Birds of the World 2016) of all 8 study species, some edges of ecoregions in Fig.1 (in main text) appear as straight lines. GIS layers for the EPA ecoregions were obtained from the EPA (U.S. Environmental Protection Agency 2017a).

Calculation of median natal dispersal distances and buffer sizes

For each species, we calculated a median natal dispersal distance based on a species' general diet and its average body size (Sutherland et al. 2000). The dispersal distances (km) were: Kentucky Warbler (*Geothlypis formosa*, 2.6), Acadian Flycatcher (*Empidonax virescens*, 2.4), Hairy Woodpecker (*Picoides villosus,* 1.3), White-breasted Nuthatch (*Sitta carolinensis*, 1.0), Yellow-breasted Chat (*Icteria virens*, 1.1), Ruby-throated Hummingbird (*Archilochus colubris*, 0.8), Northern Mockingbird (*Mimus polyglottos*, 1.2), and Brown-headed Cowbird (*Molothrus ater*, 1.2). We used this distance to define the spatial extent of the landscape for each species (Gutzwiller et al. 2015) and created a landscape sampling buffer that extended this distance from both sides of a Breeding Bird Survey (BBS) route.

A species-specific landscape buffer based on the median natal dispersal distance was created around the boundaries of each EPA Level III ecoregion; shapefiles of ecoregions were obtained from the U.S. Environmental Protection Agency (2017b). To ensure that the landscape-scale measurements around a route did not involve information from more than one EPA Level III ecoregion, no routes that intersected the buffer along an ecoregion boundary were used in the analysis.

Rationale for nonfocal explanatory variables (candidate covariates)

Effects of several variables were studied at both the regional and landscape scales because the regional- and landscape-scale measures of variables we considered had the potential to affect avian abundance along the BBS routes. Nonfocal explanatory variables were included as candidate base variables to control for variables that had the potential to be associated with the focal explanatory variables, or to control for variation in abundance that was not of primary interest.

Precipitation during the spring (regional and landscape scales)
Weather conditions before the start of the breeding season can affect populations of many bird species (Sæther et al. 2004). Spring precipitation helps to establish soil moisture at the start of the growing season, and less spring precipitation can result in lower aboveground net primary productivity (Heisler-White et al. 2008). A decrease in net aboveground productivity may lead to a decrease in arthropod abundance (Kaspari et al. 2000, Kaspari 2001). There is a positive relationship between arthropod availability and abundance of individual forest bird species (Sillett et al. 2000, Jones et al. 2003). Given the connections between spring precipitation, vegetation growth, and arthropod availability, and the relationships between arthropod availability and avian abundance, precipitation during the spring has the potential to affect avian abundance.

Daily minimum temperature of the two coldest months (regional and landscape scales)
Winter temperatures affect survival (Forsman and Mönkkönen 2003, Jones et al. 2003) and occupancy (Zuckerberg et al. 2011) of overwintering birds and summer productivity of habitat (Illán et al. 2014). Winter temperatures significantly affect abundances of terrestrial breeding bird species (Howard et al. 2015), and warmer winters have been associated with a higher abundance of individual resident breeding bird species (Jones et al. 2003). Hence, the minimum temperature of the two coldest months can potentially affect avian abundance.

Percent area covered by developed land (regional and landscape scales)
Participation in birding-related activities varies with income (Carver 2009). Higher home densities can result in higher incidences of generalist bird species and lower incidences of specialist bird species (Fraterrigo and Wiens 2005), and therefore affect the abundance of the species we are studying. Potentially, values of the socioeconomic variables could be associated with the percentage of area covered by developed land. Including percentage of area covered by developed land in the analyses as a candidate covariate enabled us to control analytically for these effects, which were not of primary interest in our analysis. We used the 30-m resolution 2011 National Land Cover Database land-cover class = 2 for developed land (MRLC 2016). Areas ranging from those with some construction but mostly vegetation (class 21) to 100% impervious surface (class 24) were included in developed land (MRLC 2016).

Percent area covered by forest types (regional and landscape scales)
To assess correlations between variables, we used Kendall's *tau b* when there were many tied observations (Xu et al. 2013) (i.e., regional-scale data) and Pearson's correlation coefficient (r) when the data had few tied observations. A preliminary analysis indicated that there were negative correlations between percent deciduous forest and percent evergreen forest at both the landscape (r = -0.93) and regional scales (*tau b* = -0.59). At the landscape and regional scales, there were weak correlations between percent mixed forest and percent deciduous forest (r = -0.06, *tau b* = 0.35, respectively) and between percent mixed forest and percent evergreen forest

($r = 0.14$, *tau b* = 0.07, respectively). We wanted to avoid using correlated variables in the same model. Because only a few of our species were associated with evergreen forest (Drapeau et al. 2000, Holmes and Sherry 2001, Billerman et al. 2020), and because of the pattern of correlations explained immediately above, we decided to include only percent deciduous forest and percent mixed forest as candidate covariates in our analysis.

Mean day of the year of BBS survey
BBSs are conducted during the breeding season, but the date of survey varies somewhat by route and year. Detectability of species may decline as the breeding season progresses because of concomitant declines in species' singing frequency (Sólymos et al. 2012), and this phenomenon could affect the recorded abundance for a species.

400-m buffer area around each BBS route
During a BBS, birds within approximately 400-m of the route are thought to be sampled by the observer (Sauer et al. 2003). However, BBS routes follow secondary roads and may not be a straight line. The total area sampled around a route may therefore vary due to the sinuosity of the route (Gutzwiller et al. 2015). This variation in area sampled could lead to variation in the number of birds detected per route and, consequently, in observed abundance. To control analytically for this potential source of variation associated with the area sampled, we used the area within 400 m of a BBS route as a candidate covariate in the statistical modeling.

Area of landscapes and EPA Level III ecoregions
Landscape-scale measurements were made within the buffers around each BBS route. The area of landscape depends on the median natal dispersal distance (Sutherland et al. 2000) of the species, length of the route, and the sinuosity of the route. Because the area of the landscape around each route varied, this variation could affect the observations of our landscape-scale weather variables (precipitation during the spring, and minimum temperature of the two coldest months). Specifically, larger areas may have a greater variety of possible values than may smaller areas. To control for the effect of differences in landscape area, we considered using landscape area as a covariate. However, we found that another covariate, the area of the 400m buffer around a BBS route, was highly correlated ($r = 0.93$ to 0.99) with the area of the landscape. Therefore, we did not use the area of the landscape as a candidate covariate to control for variation in size of the landscape sampled; the size of the 400m buffer was sufficient for this purpose.

Because the areas of EPA Level III ecoregions vary in size, these areas may affect the variety of possible values of regional-scale climate and weather variables (daily maximum breeding-season temperature, precipitation during the spring, and daily minimum temperature of the two coldest months). Regional area was not correlated with landscape area (*tau b* = 0.12 to 0.15) or with the size of the 400-m buffer around each route (*tau b* = 0.09 to 0.10). To control statistically for the effect of regional-scale area, we included the area of the region as a candidate covariate in the statistical modeling.

Assistant use during a BBS

Many BBS routes are run using an assistant to help with activities like navigation and recording weather data (Downes et al. 2016), but the assistant does not count or record birds. The use of an assistant differs from the double-observer method because with the double-observer method there are two observers actively recording the birds and alternating as the primary and secondary observer (Nichols et al. 2000). When an observer approaches a survey location, birds nearby may flush away from the survey area or stop vocalizing (Buckland et al. 2008). The presence of an assistant may increase the level of disturbance and thus affect detection of birds during a single-observer bird survey. Effects of disturbance on birds could in turn affect observed abundance on a route. We analytically controlled for assistant use by using the number of years that a BBS route involved an assistant during 2010-2012 (0, 1, 2, or 3 years) as a candidate covariate in our models.

First-time Observers

We defined first-time observers as those who had not previously conducted a BBS survey. First-time observers on a BBS route may affect detection rates (Kendall et al. 1996), and this phenomenon could affect the recorded abundance for a species. We analytically controlled for first-time observer effects by using the number of years that a BBS route was run by a first-time observer during 2010-2012 (0, 1, 2, or 3 years) as a candidate covariate in our models.

Excessive noise

The BBS survey defines excessive noise as any constant (> 45 seconds) noise at any 1 of the 50 stops along a BBS route that affects the observer's ability to hear birds (U.S. Geological Survey Patuxent Wildlife Research Center and Canadian Wildlife Service 1998). The number of birds detected, and hence the recorded abundances of species, may be affected by excessive noise at stops along the BBS route. We used the total number of stops with excessive noise (2010-2012) as a candidate covariate to control analytically for the effect of excessive noise. Accounting for noise also may indirectly control for differences among observers in the ability to detect sounds in the presence of background noise. Because this ability can be lower in older observers, controlling for noise may help to control for observer differences associated with age.

Calculation of weighted averages for socioeconomic variables

The socioeconomic data came from the American Community Survey (U.S. Census Bureau 2015). A five-year estimate has the smallest sampling error and is the only estimate available for census blocks with populations < 20,000 (U.S. Census Bureau 2009). Some of the census blocks in our study area had populations < 20,000. Because our landscapes covered more than one census block group, we wanted to ensure that all estimates of the socioeconomic data we used were from the same period. Therefore, we used a five-year (2009-2013) estimate of the socioeconomic data for all the census blocks in our study. To calculate the area-weighted averages of the socioeconomic variables, we calculated the area of the landscape that overlapped each census block group (U.S. Census Bureau 2016). We multiplied this area by the value obtained from the American Community Survey for the census block group. We then summed the products and divided this sum by the total area of the landscape. For example, suppose a landscape had an area of 46 km^2 and overlapped three census block groups. Inside the landscape, Block A had an area of 12 km^2 and a median age of 22, Block B had an area of 28 km^2 and a median age of 31, and Block C had an area of 6 km^2 and a median age of 41. Our area-weighted average for median age for the landscape would be:

$$\frac{(12 \times 22) + (28 \times 31) + (6 \times 41)}{46} = 30.0 \text{ years}$$

Calculation of precipitation during the spring months (regional and landscape scales)
Raster data of total precipitation (spatial resolution = 4 km) during the months of March and April (2010-12) were obtained from the PRISM Climate Group (2016), and a raster dataset with the averages of total precipitation for the six months was created for the entire study area in ArcGIS 10.1 (ESRI 2012). To calculate the six-month average, we added the total precipitations for the six months and divided the sum by six. The zonal statistics tool in ArcGIS was used to calculate the average total precipitation during the spring within each landscape and within each EPA Level III ecoregion.

Calculation of daily minimum temperature of the two coldest months (regional and landscape scales)
Raster data of average daily minimum temperature (spatial resolution = 4 km) of the months of December (2009, 2010, and 2011) and January (2010, 2011, and 2012) were obtained from the PRISM Climate Group (2016), and a raster dataset with the averages for the six months was created for the entire study area in ArcGIS 10.1 (ESRI 2012). To calculate the six-month average, we added the average daily minimum temperatures for the six months and divided the sum by six. The zonal statistics tool in ArcGIS was used to calculate the average minimum temperature of the two coldest months within each landscape and within each EPA Level III ecoregion.

Calculation of daily maximum breeding-season temperature (regional and landscape scales)
Raster data of 30-year (1981-2010) average daily maximum temperature (spatial resolution = 800 m) for the months of May, June, and July were obtained from the PRISM Climate Group (2016), and a raster dataset with the average for the three months was created for the entire study area in ArcGIS 10.1 (ESRI 2012). To calculate the average, we added the average maximum daily temperature for the three months and divided the sum by three. The zonal statistics tool in ArcGIS was used to calculate the average maximum breeding-season temperature within each landscape and within each EPA Level III ecoregion.

Binning of landscape temperature
To avoid having widely different levels of power for detecting cross-scale and within-scale interactions, we designed the analyses so that the number of different values of landscape-scale mean daily maximum breeding-season temperature (LndMaxTemp) would be the same as the number of regional-scale mean daily maximum breeding-season temperatures (RegMaxTemp).

There were 14 EPA level III regions (hence 14 RegMaxTemp values). Therefore, we binned the LndMaxTemp into 14 bins for all 8 species. To ensure that each bin had at least 10 observations, we used a slightly larger bin width for the bin containing the lowest temperatures; the actual number of observations in this first bin ranged from 16 to 19 for the 8 species. The remaining 13 bins were created by dividing the difference between the lowest LndMaxTemp not included in the first bin and the highest LndMaxTemp for all 8 species by 13. The difference in the highest LndMaxTemp observation among the eight species was < 0.04 °C. The bin widths for all eight species were identical (first bin = 2.90°C, remaining bins = 0.55°C). We used the median of the LndMaxTemp values in a given bin as the LndMaxTemp value for the observations in that bin.

No binning of regional temperature was needed because we used the mean temperature of the EPA Level III ecoregion as the RegMaxTemp for all the observations within that region.

Statistical analyses

If spatial autocorrelation was detected in the residuals of the best-supported model (model with lowest AICc value among the set of competing models; see Table 3 in the main text), we added spatial eigenvectors to the model to remove the autocorrelation (Gutzwiller et al. 2015). We used the output from SAM 4.0's (Rangel et al. 2010) eigenvector-based spatial filtering module to identify which eigenvectors would reduce Moran's *I* for the residuals. To decide which eigenvectors to include, we used r^2 values from the SAM 4.0 output to choose the spatial eigenvector that was most correlated with the response variable. Spatial eigenvectors were added one at a time, and residuals for the model with the added spatial eigenvector were checked for spatial autocorrelation. This process was continued until the absolute value of Moran's *I* for all distance classes was ≤ 0.1 (Gutzwiller et al. 2015).

We used techniques (Neter et al. 1989) involving residuals of the best-supported model to confirm that none of the variables in the model was informative in a different form (e.g., quadratic instead of linear). Standard procedures (Hilbe 2014) were used to make certain that the independence assumption of the NB model was met.

Variance Inflation Factors (VIF) can be used to measure collinearity between explanatory variables, and VIFs ≥ 3 are considered to be high (Zuur et al. 2010). To reduce multicollinearity among covariates in the base model during the first stage of analyses, we removed covariates with VIF ≥ 3 one at a time (by removing the variable with the highest VIF first) until all covariates in the base model had VIFs < 3. If two covariates with VIFs ≥ 3 had equal VIF values, the covariate associated with the lower R^2_{COR} was removed. VIFs also were calculated for the variables in the best-supported models, and most variables had VIFs < 3 (Appendix 1, Table A1.2).

Mean Absolute Error (MAE) was calculated as the average magnitude of the prediction error. MAE for the best-supported model (fitted) was obtained using R package Metrics (Hamner and Frasco 2018). We used the leave-one-out method (Harrell 2001) and the function cv.glm in R package boot (Canty and Ripley 2017) to cross-validate each best-supported model. MAEs for the fitted and cross-validated models were reported in Appendix 1, Table A1.2. Lower values of MAE indicated a better fit (Chuang and Chang 2014).

The process of computing the changes in Akaike's Information Criterion corrected for small sample size (ΔAIC_c) as a measure of variable influence (Coppes et al. 2017) involved removing the variable of interest from the best-supported model and calculating the difference in AIC_c between the reduced model and the best-supported model. To estimate the change in AIC_c associated with an interaction effect (cross-product term) in a best-supported model, only the interaction effect was removed from the best-supported model. To estimate the change in AIC_c associated with a main-effect variable involved in an interaction in a best-supported model, both the main effect and the associated interaction effect were removed from the best-supported model.

Creation of the within-scale interaction figure

First, using the ranges of the two variables involved in the interaction and the observed average values of all other variables in the best-supported model, a dataset with 1000 observations was created in R (R Core Team 2019). We then used this dataset and the regression coefficients from the best-supported model to compute values for the predicted response surface (B. S. Cade, personal communication). Finally, the within-scale interaction figure (Fig. 2, in main text) was created by using SigmaPlot 14.0 (Systat Software, San Jose, CA) to plot the predicted relative abundance of Yellow-breasted Chat against landscape-scale mean daily maximum temperature during the breeding season and median income.

Additional details about the within-scale interaction effect on the Yellow-breasted Chat

The relative abundance of the Yellow-breasted Chat increased with increasing LndMaxTemp; MedianInc was positively associated with relative abundance in the landscapes with the highest LndMaxTemp values and negatively associated with relative abundance in the landscapes with lower LndMaxTemp (Fig. 2, in main text). Higher temperatures are associated with higher forest productivity (Raich et al. 2006). Higher temperatures and productivity are associated with a greater abundance of insects (e.g., Kaspari 2001)—a crucial food for the Yellow-breasted Chat during the breeding season (Ehrlich et al. 1988)—which may have led to a gradual increase in the relative abundance of this species with increasing LndMaxTemp (Fig. 2). The Yellow-breasted Chat's association with increasing MedianInc varied with LndMaxTemp (Fig. 2), and we hypothesize that this variation arose from the effect of maximum breeding-season temperature on human contributions to the conservation of natural places.

Participation in wildlife watching near home and on trips away from home is greater with higher income (U.S. Department of Interior et al. 2018). Higher-income populations also are likely to be more involved in local environmental advisory bodies (Wellstead et al. 2003) and grassroots environmental movements (Weber 2000), and higher income is positively associated with proenvironmental behavior such as contributing time and money to conservation (Theodori and Luloff 2002). The desire to conserve biodiversity, however, may be affected by the level of contact with nature (Zhang et al. 2014, Soga et al. 2016, Schuttler et al. 2018). LndMaxTemp during the breeding season may have affected the degree of contact between nature and local populations, including those with higher MedianInc.

Environmental conditions such as temperature and sunlight can affect human behaviors (Van de Vliert et al. 2004, Murray et al. 2010). We suggest that in the warmest landscapes, the temperatures during the breeding season were often uncomfortably high, people there went out for wildlife watching less frequently and, because of less contact with nature, their contribution to the conservation of natural places was lower. We propose that as MedianInc increased in landscapes with higher LndMaxTemp (Fig. 2), there were fewer individuals in local decision-making bodies in those landscapes who had a desire to conserve nature (because uncomfortable temperatures resulted in less contact with nature), leading to fewer decisions that supported conservation. In landscapes with less support for conservation, there may have been less conservation of forests. Forests in such landscapes may have been more fragmented and provided more edge habitat for the Yellow-breasted Chat. This increase in relative abundance of the Yellow-breasted Chat in the warmest landscapes with increasing MedianInc (Fig. 2) may thus be a consequence of temperature affecting human behavior. But, as LndMaxTemp decreased, visits to natural places (contact with nature) may have increased, and as MedianInc increased, support for conservation (via individual activities or through decision-making bodies) may have increased, resulting in more contiguous forest. Consequently, as LndMaxTemp declined and MedianInc increased, less edge habitat may have been available for the Yellow-breasted Chat, resulting in a low relative abundance for the species (Fig. 2).

Influences of landscape-scale percent of deciduous forest and landscape-scale minimum temperature of the two coldest months

Landscape-scale percent of deciduous forest (LndPercDec) occurred in models of four species and had the highest ΔAIC_c among the variables considered for three forest-interior species (Acadian Flycatcher, Hairy Woodpecker, and White-breasted Nuthatch; Table 6 in the main text, Appendix 1, Table A1.2). The relative abundance of these species increased with LndPercDec, but the relative abundance of the Northern Mockingbird, a forest-edge species, declined with greater LndPercDec. The fact that LndPercDec was informative for the relative abundance of the three forest-interior species is consistent with findings (Smith et al. 2011) that the percentage of forest in the landscape was the most important variable for occurrence and richness of forest birds. The Northern Mockingbird is associated with forest edges and open areas with scattered shrubs and small trees (Freemark and Collins 1992, Farnsworth et al. 2020), and its decline in relative abundance with increasing LndPercDec (Appendix 1, Table A1.2) may be because more area in forest resulted in less habitat for this species.

Landscape-scale daily minimum temperature of the two coldest months (LndWinTemp) was the only weather variable that was informative for more than one species (Northern Mockingbird and Yellow-breasted Chat; Appendix 1, Table A1.2), and its relative influence (ΔAIC_c) was high in the models for Northern Mockingbird (Table 6 in the main text). Pre-breeding season weather can affect population size of many bird species (Sæther et al. 2004). The presence of informative pre-breeding season weather variables (e.g., LndWinTemp) in some species' best-supported models is consistent with this idea. The higher relative abundance of Northern Mockingbird with higher LndWinTemp in the present study supports findings that abundance of resident species is higher following warmer winters (Lemoine and Bohning-Gaese 2003, Jones et al. 2003). The decline in relative abundance of the Yellow-breasted Chat with warmer winters is consistent with findings (Lemoine and Bohning-Gaese 2003) that the number of individuals of long-distance migrants declines on the breeding grounds following warmer winters because resident birds benefit from milder winters and fewer resources are therefore available for migrants (Lemoine and Bohning-Gaese 2003).

Frequency and geographic distributions for socioeconomic variables

The conclusions drawn for the socioeconomic variables in the analyses (population that was female and ≥ 30 years old [PercFemale], percent of the population ≥ 25 years old with ≥ 4 years of college [PercColleg], median age of the population [MedianAge], and median income of the population [MedianInc]) could potentially be misleading if there was little variation in the data. For example, if most of the median income observations had one value (e.g., 50,000 U.S. dollars) and only a few large or small values were driving the interaction observed in Fig. 2 (in the main text), the results of the study may not have meaningful implications. Fig. A1.1, based on data for the species with the largest number of observations (Ruby-throated Hummingbird, n = 390), demonstrated that there was enough variation in the underlying socioeconomic data to justify the conclusions. The histograms of socioeconomic variables for the remaining seven species (not provided) were very similar because many of the BBS routes used were the same among species.

We assessed whether there were geographic patterns in the socioeconomic variables that might indicate potential confounding between these variables and broad-scale environmental conditions (e.g., temperature, precipitation, or the soil and forest types they influence). As general proxies for this set of conditions, we used each observation's longitude and latitude. Fig. A1.2 shows scatterplots for the four socioeconomic variables against longitude (°E) and latitude (°N) for the set of routes (n = 390) used for the Ruby-throated Hummingbird. Scatterplots for socioeconomic variables for the remaining seven species (not provided) were very similar because many of the BBS routes used were the same among species. The scatterplots indicate that there were no strong geographic gradients in the socioeconomic variables. Pearson correlation coefficients supported this conclusion. The Pearson correlations (r) between Longitude (°E) and the four socioeconomic variables were: PercFemale (0.189), PercColleg (0.271), MedianAge (0.074), and MedianInc (0.334). The Pearson correlations between Latitude (°N) and the four socioeconomic variables were: PercFemale (0.061), PercColleg (0.297), MedianAge (0.194), and MedianInc (0.457).

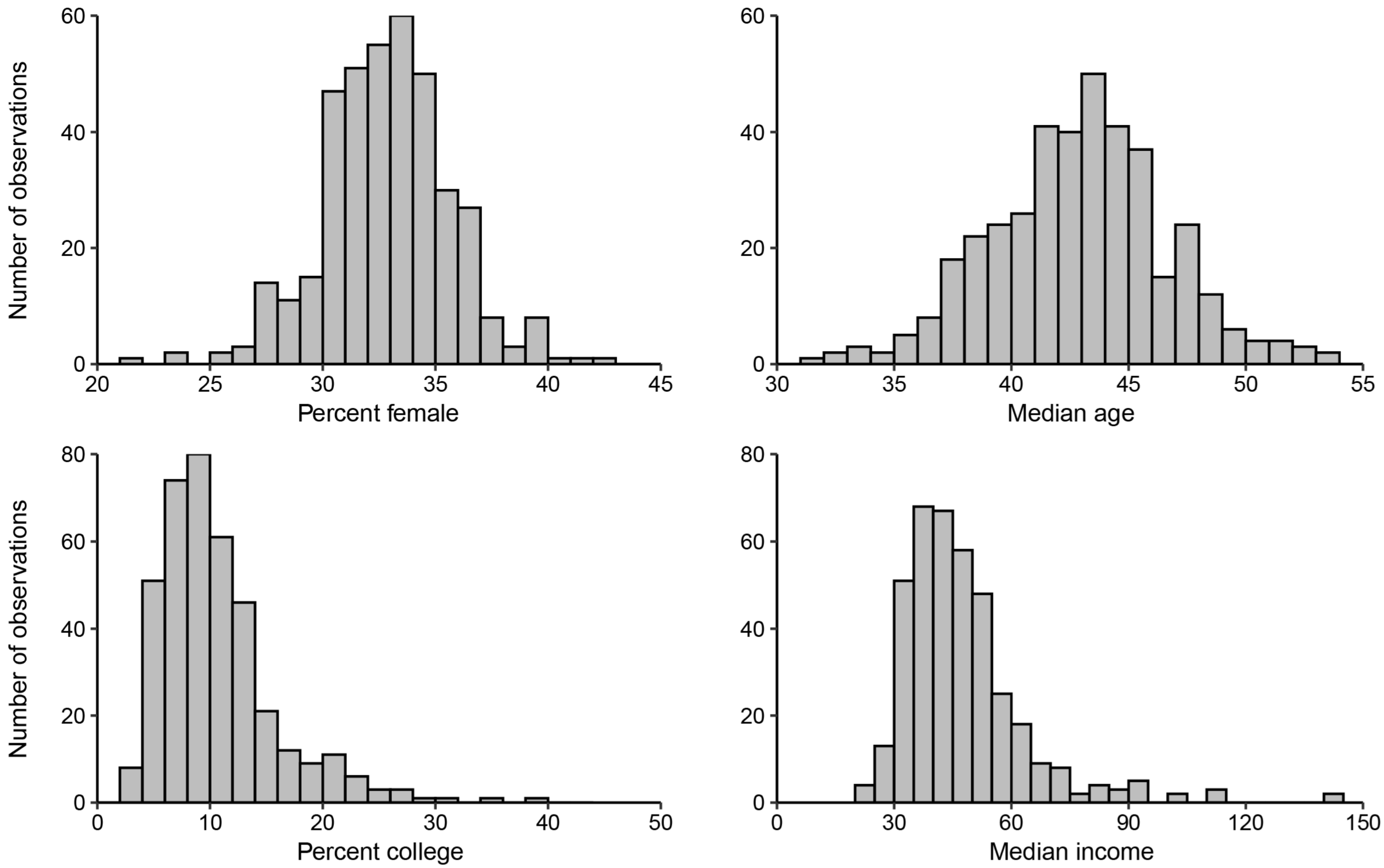

Fig. A1.1. Histograms for percent of the population that was female and ≥ 30 years old (Percent female), median age (years) of the population, percent of the population ≥ 25 years old with ≥ 4 years of college (Percent college), and median income (thousands of U.S. dollars) of the population for the set of routes (n = 390) used for the Ruby-throated Hummingbird. This species was used to show these distributions because it had the largest number of observations (routes) among the eight species in the analysis. The histograms of socioeconomic variables for the remaining seven species (not provided) were very similar because many of the BBS routes used were the same among species.

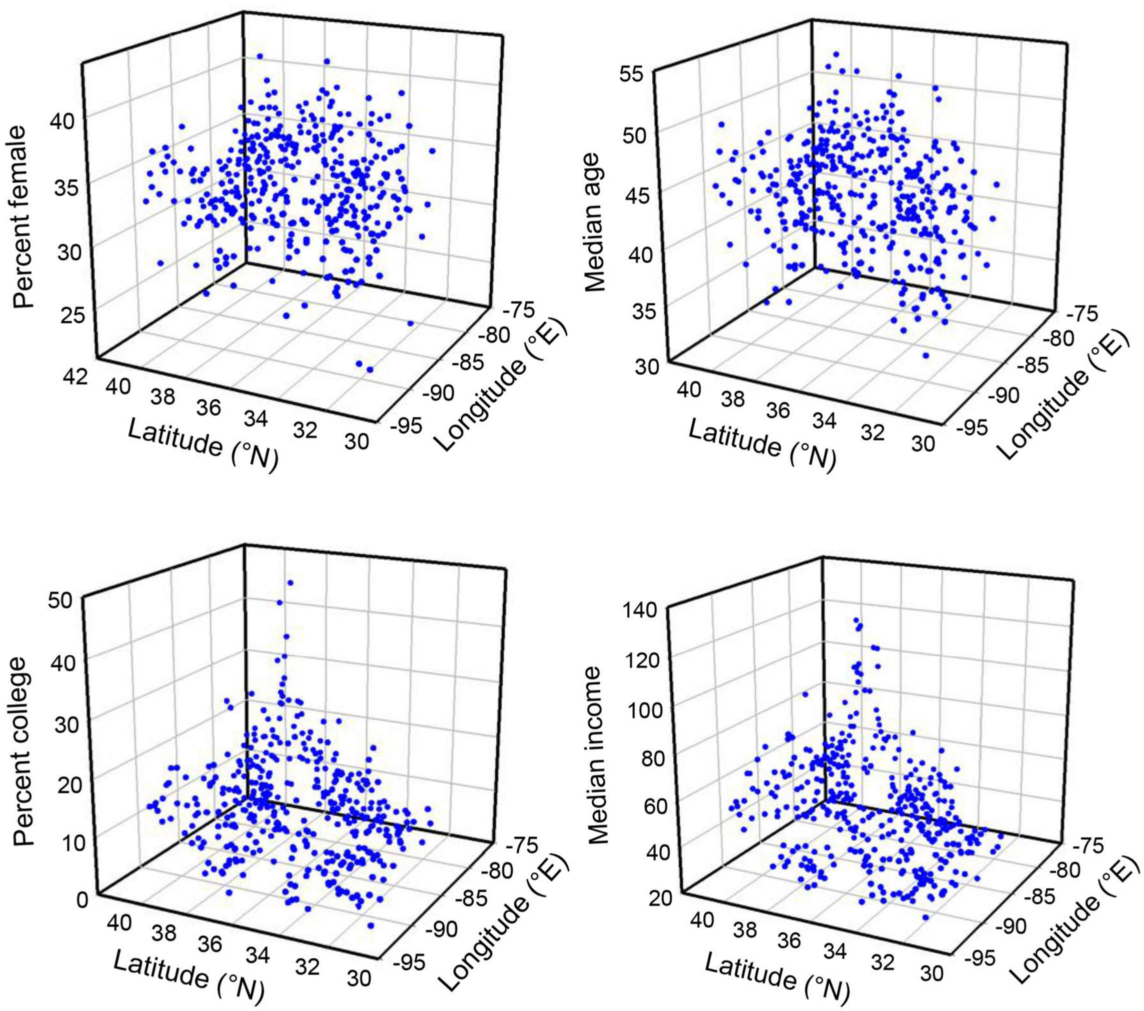

Fig. A1.2. Scatterplots for percent of the population that was female and ≥ 30 years old (Percent female), median age (years) of the population, percent of the population ≥ 25 years old with ≥ 4 years of college (Percent college), and median income (thousands of U.S. dollars) of the population against longitude (°E) and latitude (°N) for the set of routes (n = 390) used for the Ruby-throated Hummingbird. This species was used to show these relationships because it had the largest number of observations (routes) among the eight species in the analysis. The scatterplots for socioeconomic variables for the remaining seven species (not provided) were very similar because many of the BBS routes used were the same among species.

Table A1.1. Statistics for AIC_c-based model selection for each socioeconomic variable and species.

Socioeconomic variable	Model †	*K* ‡	Log likelihood	AIC_c	AIC_c difference §	w_i ‖
Percent female	*Kentucky Warbler*					
	Additive with landscape temperature	4	-713.22	1434.55	0.00	0.253
	Intercept only	2	-715.29	1434.62	0.07	0.245
	Additive with both temperatures	5	-712.34	1434.85	0.30	0.218
	Within-scale interaction	5	-712.98	1436.12	1.57	0.115
	Additive with regional temperature	4	-714.33	1436.78	2.23	0.083
	Both interactions	7	-711.63	1437.58	3.03	0.056
	Cross-scale interaction	5	-714.32	1438.81	4.26	0.030
	Acadian Flycatcher					
	Additive with regional temperature	5	-1037.09	2084.34	0.00	0.518
	Additive with both temperatures	6	-1036.87	2085.98	1.65	0.228
	Cross-scale interaction	6	-1037.06	2086.36	2.02	0.188
	Global	8	-1036.58	2089.56	5.22	0.038
	Additive with landscape temperature	5	-1040.79	2091.75	7.41	0.013
	Base	3	-1043.05	2092.17	7.83	0.010
	Within-scale interaction	6	-1040.77	2093.79	9.45	0.005
	Both interactions	7	-1063.47	2141.27	56.93	0.000
	Intercept only	2	-1071.10	2146.24	61.90	0.000
	Hairy Woodpecker					
	Within-scale interaction	6	-554.99	1122.20	0.00	0.335

Additive with landscape temperature	5	-556.34	1122.84	0.63	0.244
Additive with both temperatures	6	-555.74	1123.70	1.50	0.158
Base	3	-559.21	1124.49	2.29	0.107
Global	8	-554.23	1124.84	2.64	0.090
Additive with regional temperature	5	-558.14	1126.44	4.24	0.040
Cross-scale interaction	6	-557.54	1127.31	5.10	0.026
Both interactions	7	-561.26	1136.81	14.61	0.000
Intercept only	2	-578.63	1161.30	39.09	0.000
White-breasted Nuthatch					
Additive with both temperatures	8	-1004.69	2025.76	0.00	0.365
Additive with landscape temperature	7	-1005.80	2025.89	0.13	0.341
Global	10	-1003.60	2027.77	2.02	0.133
Within-scale interaction	8	-1005.71	2027.80	2.04	0.131
Base	5	-1010.54	2031.25	5.49	0.023
Additive with regional temperature	7	-1010.36	2035.02	9.26	0.004
Cross-scale interaction	8	-1009.63	2035.63	9.87	0.003
Both interactions	7	-1055.10	2124.50	98.75	0.000
Intercept only	2	-1115.17	2234.38	208.62	0.000
Yellow-breasted Chat					
Additive with landscape temperature	7	-1452.98	2920.25	0.00	0.529
Within-scale interaction	8	-1452.82	2922.01	1.76	0.219
Additive with both temperatures	8	-1452.88	2922.13	1.88	0.206
Global	10	-1452.27	2925.13	4.88	0.046
Both interactions	7	-1470.02	2954.34	34.09	0.000

Additive with regional temperature	7	-1471.38	2957.06	36.81	0.000
Cross-scale interaction	8	-1471.23	2958.84	38.59	0.000
Base	5	-1476.36	2962.88	42.63	0.000
Intercept only	2	-1532.07	3068.16	147.92	0.000
Ruby-throated Hummingbird					
Additive with landscape temperature	4	-817.04	1642.17	0.00	0.337
Additive with regional temperature	4	-817.62	1643.34	1.17	0.188
Within-scale interaction	5	-816.89	1643.94	1.76	0.140
Additive with both temperatures	5	-816.99	1644.14	1.96	0.126
Intercept only	2	-820.16	1644.36	2.18	0.113
Cross-scale interaction	5	-817.48	1645.12	2.94	0.077
Both interactions	7	-816.81	1647.90	5.73	0.019
Northern Mockingbird					
Additive with landscape temperature	7	-1905.61	3825.52	0.00	0.311
Within-scale interaction	8	-1904.80	3825.99	0.47	0.246
Base	5	-1908.35	3826.86	1.34	0.159
Additive with both temperatures	8	-1905.41	3827.19	1.68	0.135
Additive with regional temperature	7	-1907.25	3828.80	3.29	0.060
Global	10	-1904.36	3829.31	3.80	0.047
Cross-scale interaction	8	-1906.56	3829.49	3.98	0.043
Both interactions	7	-1927.12	3868.54	43.03	0.000
Intercept only	2	-1967.48	3939.00	113.48	0.000

	Brown-headed Cowbird					
	Cross-scale interaction	5	-1722.63	3455.41	0.00	0.452
	Within-scale interaction	5	-1723.57	3457.29	1.88	0.177
	Additive with regional temperature	4	-1724.99	3458.08	2.67	0.119
	Additive with landscape temperature	4	-1724.99	3458.08	2.67	0.119
	Both interactions	7	-1722.31	3458.91	3.50	0.078
	Additive with both temperatures	5	-1724.96	3460.08	4.67	0.044
	Intercept only	2	-1729.42	3462.87	7.46	0.011
Percent college	*Kentucky Warbler*					
	Within-scale interaction	5	-698.82	1407.82	0.00	0.788
	Both interactions	7	-698.38	1411.08	3.27	0.154
	Cross-scale interaction	5	-701.67	1413.52	5.70	0.046
	Additive with landscape temperature	4	-704.72	1417.56	9.74	0.006
	Additive with both temperatures	5	-704.05	1418.26	10.45	0.004
	Additive with regional temperature	4	-705.80	1419.71	11.89	0.002
	Intercept only	2	-715.29	1434.62	26.80	0.000
	Acadian Flycatcher					
	Additive with regional temperature	5	-1037.11	2084.38	0.00	0.368
	Cross-scale interaction	6	-1036.11	2084.46	0.08	0.354
	Additive with both temperatures	6	-1036.84	2085.93	1.54	0.170
	Global	8	-1035.52	2087.45	3.07	0.079
	Additive with landscape temperature	5	-1040.61	2091.39	7.01	0.011
	Within-scale interaction	6	-1039.71	2091.66	7.28	0.010
	Base	3	-1043.05	2092.17	7.79	0.008

Both interactions	7	-1061.19	2136.69	52.31	0.000
Intercept only	2	-1071.10	2146.24	61.85	0.000
Hairy Woodpecker					
Additive with landscape temperature	5	-555.15	1120.46	0.00	0.308
Additive with both temperatures	6	-554.29	1120.80	0.35	0.259
Within-scale interaction	6	-554.81	1121.83	1.38	0.155
Additive with regional temperature	5	-556.21	1122.57	2.11	0.107
Cross-scale interaction	6	-555.64	1123.50	3.05	0.067
Global	8	-553.62	1123.61	3.16	0.063
Base	3	-559.21	1124.49	4.03	0.041
Both interactions	7	-563.37	1141.03	20.58	0.000
Intercept only	2	-578.63	1161.30	40.84	0.000
White-breasted Nuthatch					
Additive with both temperatures	8	-992.99	2002.35	0.00	0.603
Additive with regional temperature	7	-995.68	2005.65	3.30	0.116
Additive with landscape temperature	7	-995.83	2005.95	3.60	0.100
Global	10	-992.77	2006.12	3.77	0.092
Cross-scale interaction	8	-995.41	2007.21	4.86	0.053
Within-scale interaction	8	-995.80	2007.97	5.62	0.036
Base	5	-1010.54	2031.25	28.90	0.000
Both interactions	7	-1051.52	2117.33	114.99	0.000
Intercept only	2	-1115.17	2234.38	232.03	0.000

Yellow-breasted Chat					
Within-scale interaction	8	-1438.67	2893.72	0.00	0.815
Global	10	-1438.42	2897.42	3.69	0.129
Both interactions	7	-1443.17	2900.63	6.91	0.026
Additive with landscape temperature	7	-1443.33	2900.95	7.23	0.022
Additive with both temperatures	8	-1443.16	2902.69	8.97	0.009
Cross-scale interaction	8	-1456.24	2928.87	35.15	0.000
Additive with regional temperature	7	-1459.34	2932.97	39.25	0.000
Base	5	-1476.36	2962.88	69.16	0.000
Intercept only	2	-1532.07	3068.16	174.44	0.000
Ruby-throated Hummingbird					
Additive with landscape temperature	4	-811.32	1630.73	0.00	0.368
Within-scale interaction	5	-811.31	1632.79	2.05	0.132
Additive with both temperatures	5	-810.59	1631.34	0.60	0.272
Additive with regional temperature	4	-812.45	1633.01	2.27	0.118
Both interactions	7	-810.05	1634.39	3.66	0.059
Cross-scale interaction	5	-812.29	1634.74	4.00	0.050
Intercept only	2	-820.16	1644.36	13.62	0.000
Northern Mockingbird					
Additive with landscape temperature	7	-1902.14	3818.58	0.00	0.409
Additive with regional temperature	7	-1902.98	3820.25	1.67	0.178
Within-scale interaction	8	-1902.02	3820.42	1.84	0.163
Additive with both temperatures	8	-1902.12	3820.61	2.03	0.148
Cross-scale interaction	8	-1902.97	3822.32	3.74	0.063

	Global	10	-1901.54	3823.66	5.08	0.032
	Base	5	-1908.35	3826.86	8.28	0.007
	Both interactions	7	-1919.19	3852.67	34.09	0.000
	Intercept only	2	-1967.48	3939.00	120.42	0.000
	Brown-headed Cowbird					
	Intercept-only	2	-1729.42	3462.87	0.00	0.559
	Cross-scale interaction	5	-1727.77	3465.69	2.83	0.136
	Additive with regional temperature	4	-1729.15	3466.41	3.54	0.095
	Additive with landscape temperature	4	-1729.16	3466.41	3.55	0.095
	Within-scale interaction	5	-1728.68	3467.51	4.65	0.055
	Additive with both temperatures	5	-1729.15	3468.45	5.58	0.034
	Both interactions	7	-1727.36	3469.03	6.16	0.026
Median age	*Kentucky Warbler*					
	Within-scale interaction	5	-710.32	1430.81	0.00	0.408
	Additive with landscape temperature	4	-712.05	1432.22	1.41	0.201
	Additive with both temperatures	5	-711.59	1433.35	2.54	0.115
	Both interactions	7	-709.52	1433.36	2.56	0.114
	Intercept only	2	-715.29	1434.62	3.81	0.061
	Additive with regional temperature	4	-713.26	1434.63	3.82	0.060
	Cross-scale interaction	5	-712.61	1435.39	4.58	0.041
	Acadian Flycatcher					
	Additive with regional temperature	5	-1036.51	2083.19	0.00	0.433
	Cross-scale interaction	6	-1035.91	2084.06	0.87	0.280

Additive with both temperatures	6	-1036.39	2085.01	1.81	0.175
Global	8	-1034.98	2086.37	3.18	0.088
Additive with landscape temperature	5	-1039.97	2090.10	6.91	0.014
Within-scale interaction	6	-1039.81	2091.85	8.66	0.006
Base	3	-1043.05	2092.17	8.98	0.005
Both interactions	7	-1061.04	2136.40	53.20	0.000
Intercept only	2	-1071.10	2146.24	63.04	0.000
Hairy Woodpecker					
Additive with landscape temperature	5	-556.41	1122.97	0.00	0.350
Additive with both temperatures	6	-555.84	1123.91	0.93	0.219
Base	3	-559.21	1124.49	1.52	0.164
Within-scale interaction	6	-556.31	1124.84	1.86	0.138
Additive with regional temperature	5	-558.29	1126.74	3.77	0.053
Global	8	-555.25	1126.88	3.91	0.049
Cross-scale interaction	6	-557.96	1128.13	5.16	0.026
Both interactions	7	-562.74	1139.78	16.81	0.000
Intercept only	2	-578.63	1161.30	38.32	0.000
White-breasted Nuthatch					
Additive with both temperatures	8	-1004.60	2025.58	0.00	0.357
Additive with landscape temperature	7	-1005.76	2025.82	0.24	0.317
Within-scale interaction	8	-1005.20	2026.78	1.20	0.197
Global	10	-1003.80	2028.17	2.59	0.098
Base	5	-1010.54	2031.25	5.66	0.021
Cross-scale interaction	8	-1008.87	2034.11	8.53	0.005

Additive with regional temperature	7	-1010.05	2034.39	8.81	0.004
Both interactions	7	-1052.85	2119.99	94.40	0.000
Intercept only	2	-1115.17	2234.38	208.79	0.000
Yellow-breasted Chat					
Within-scale interaction	8	-1451.75	2919.88	0.00	0.423
Additive with landscape temperature	7	-1452.99	2920.28	0.40	0.346
Additive with both temperatures	8	-1452.83	2922.05	2.17	0.143
Global	10	-1451.21	2923.01	3.12	0.089
Both interactions	7	-1467.84	2949.97	30.09	0.000
Additive with regional temperature	7	-1471.24	2956.77	36.88	0.000
Cross-scale interaction	8	-1470.34	2957.07	37.18	0.000
Base	5	-1476.36	2962.88	43.00	0.000
Intercept only	2	-1532.07	3068.16	148.28	0.000
Ruby-throated Hummingbird					
Additive with landscape temperature	4	-815.18	1638.46	0	0.352
Additive with regional temperature	4	-815.54	1639.18	0.72	0.246
Within-scale interaction	5	-815.13	1640.41	1.953	0.133
Additive with both temperatures	5	-815.15	1640.46	1.994	0.130
Cross-scale interaction	5	-815.39	1640.93	2.472	0.102
Both interactions	7	-814.99	1644.28	5.815	0.019
Intercept only	2	-820.16	1644.36	5.897	0.018
Northern Mockingbird					
Additive with landscape temperature	7	-1903.65	3821.59	0.00	0.420

	Within-scale interaction	8	-1903.25	3822.87	1.28	0.221
	Additive with both temperatures	8	-1903.46	3823.30	1.70	0.179
	Additive with regional temperature	7	-1905.30	3824.89	3.30	0.081
	Cross-scale interaction	8	-1905.10	3826.59	5.00	0.035
	Global	10	-1903.01	3826.61	5.02	0.034
	Base	5	-1908.35	3826.86	5.26	0.030
	Both interactions	7	-1924.21	3862.72	41.13	0.000
	Intercept only	2	-1967.48	3939.00	117.41	0.000
	Brown-headed Cowbird					
	Cross-scale interaction	5	-1723.55	3457.26	0.00	0.684
	Within-scale interaction	5	-1725.08	3460.33	3.06	0.148
	Both interactions	7	-1723.46	3461.22	3.96	0.095
	Intercept only	2	-1729.42	3462.87	5.60	0.042
	Additive with landscape temperature	4	-1728.49	3465.08	7.82	0.014
	Additive with regional temperature	4	-1728.51	3465.13	7.86	0.013
	Additive with both temperatures	5	-1728.48	3467.11	9.85	0.005
Median income	*Kentucky Warbler*					
	Within-scale interaction	5	-697.79	1405.75	0.00	0.864
	Both interactions	7	-697.65	1409.61	3.86	0.125
	Cross-scale interaction	5	-702.36	1414.88	9.13	0.009
	Additive with regional temperature	4	-706.01	1420.13	14.38	0.001
	Additive with both temperatures	4	-706.56	1421.24	15.49	0.000
	Additive with landscape temperature	5	-705.58	1421.34	15.59	0.000
	Intercept only	2	-715.29	1434.62	28.87	0.000

Acadian Flycatcher					
Additive with regional temperature	5	-1008.30	2026.76	0.00	0.548
Additive with both temperatures	6	-1008.26	2028.76	2.00	0.202
Cross-scale interaction	6	-1008.30	2028.83	2.07	0.195
Global	8	-1008.24	2032.89	6.13	0.026
Additive with landscape temperature	5	-1011.94	2034.05	7.29	0.014
Base	3	-1014.45	2034.97	8.20	0.009
Within-scale interaction	6	-1011.94	2036.12	9.35	0.005
Both interactions	7	-1030.33	2074.97	48.21	0.000
Intercept only	2	-1037.02	2078.07	51.31	0.000
Hairy Woodpecker					
Within-scale interaction	6	-552.32	1116.87	0.00	0.296
Global	8	-550.52	1117.42	0.56	0.224
Additive with landscape temperature	5	-553.90	1117.96	1.10	0.171
Additive with both temperatures	6	-552.96	1118.14	1.28	0.156
Additive with regional temperature	5	-554.45	1119.06	2.20	0.099
Cross-scale interaction	6	-554.15	1120.51	3.65	0.048
Base	3	-559.21	1124.49	7.62	0.007
Both interactions	7	-559.49	1133.27	16.41	0.000
Intercept only	2	-578.63	1161.30	44.43	0.000
White-breasted Nuthatch					
Additive with both temperatures	8	-992.19	2000.76	0.00	0.383
Additive with regional temperature	7	-993.72	2001.74	0.98	0.234

Additive with landscape temperature	7	-994.05	2002.40	1.65	0.168
Cross-scale interaction	8	-993.70	2003.78	3.02	0.084
Within-scale interaction	8	-993.88	2004.14	3.38	0.071
Global	10	-991.95	2004.48	3.72	0.060
Base	5	-1010.54	2031.25	30.49	0.000
Both interactions	7	-1049.42	2113.13	112.37	0.000
Intercept only	2	-1115.17	2234.38	233.62	0.000
Yellow-breasted Chat					
Within-scale interaction	8	-1440.29	2896.96	0.00	0.805
Global	10	-1439.82	2900.21	3.26	0.158
Both interactions	7	-1445.31	2904.91	7.95	0.015
Additive with landscape temperature	7	-1445.36	2905.02	8.06	0.014
Additive with both temperatures	8	-1444.98	2906.34	9.39	0.007
Additive with regional temperature	7	-1458.24	2930.78	33.83	0.000
Cross-scale interaction	8	-1457.43	2931.24	34.29	0.000
Base	5	-1476.36	2962.88	65.92	0.000
Intercept only	2	-1532.07	3068.16	171.21	0.000
Ruby-throated Hummingbird					
Within-scale interaction	5	-808.75	1627.66	0.00	0.632
Both interactions	7	-807.30	1628.89	1.24	0.340
Additive with landscape temperature	4	-813.53	1635.17	7.52	0.015
Additive with both temperatures	5	-813.52	1637.20	9.55	0.005
Additive with regional temperature	4	-814.76	1637.62	9.96	0.004
Cross-scale interaction	5	-813.90	1637.95	10.29	0.004

Intercept only	2	-820.16	1644.36	16.70	0.000
Northern Mockingbird					
Additive with landscape temperature	7	-1900.72	3815.74	0.00	0.352
Additive with regional temperature	7	-1901.08	3816.45	0.71	0.247
Additive with both temperatures	8	-1900.65	3817.69	1.95	0.133
Within-scale interaction	8	-1900.69	3817.76	2.02	0.129
Cross-scale interaction	8	-1900.94	3818.26	2.52	0.100
Global	10	-1899.80	3820.18	4.44	0.038
Base	5	-1908.35	3826.86	11.12	0.001
Both interactions	7	-1917.69	3849.68	33.94	0.000
Intercept only	2	-1967.48	3939.00	123.26	0.000
Brown-headed Cowbird					
Cross-scale interaction	5	-1724.07	3458.31	0.00	0.656
Within-scale interaction	5	-1725.73	3461.63	3.32	0.125
Both interactions	7	-1723.86	3462.02	3.71	0.103
Intercept only	2	-1729.42	3462.87	4.56	0.067
Additive with regional temperature	4	-1728.54	3465.18	6.87	0.021
Additive with landscape temperature	4	-1728.54	3465.18	6.87	0.021
Additive with both temperatures	5	-1728.53	3467.22	8.92	0.008

[†] See Table 3 in the main text for definitions of the names of competing models. The best-supported model among a set of competing models was the model with the lowest AIC_c value. Models with uninformative parameters were not considered as the second-best-supported model. For three species (Kentucky Warbler, Ruby-throated Hummingbird, and Brown-headed Cowbird) there were only seven competing models because no covariates were selected during the first stage of the analysis.

‡ K = Effective number of parameters. This number includes the intercept, number of explanatory variables (including interactions terms), and the error term.

§ Amount by which the AIC_c for the second-best-supported model exceeded the AIC_c for the best-supported model.

| Models with uninformative parameters were included in this table.

Table A1.2. Statistics for the best-supported regression models relating relative abundance for eight bird species to explanatory variables. †

Socioeconomic variable	Explanatory variable ‡	Coefficient	SE	85% CI for coefficient	R^2_{COR} (%) §	MAE fitted (predicted) ǀ	ΔAIC_c ¶	VIF
Percent female	*Kentucky Warbler*							
	Intercept	0.61	0.10	0.47 — 0.75	13.0	3.40 (3.52)		
	LndMaxTemp	0.92	0.12	0.73 — 1.12			40.7	1.5
	SpatEig2 #	-0.56	0.10	-0.72 — -0.41			31.0	1.3
	SpatEig8	-0.52	0.09	-0.65 — -0.39			28.9	1.1
	SpatEig73	0.40	0.09	0.27 — 0.53			18.5	1.0
	SpatEig9	0.54	0.11	0.35 — 0.72			14.2	1.0
	SpatEig12	0.28	0.09	0.15 — 0.40			8.4	1.0
	SpatEig42	-0.27	0.09	-0.39 — -0.15			8.4	1.0
	SpatEig15	0.30	0.09	0.16 — 0.42			7.6	1.0
	PercFemale	-0.18	0.09	-0.33 — -0.03			0.9	1.0
	Acadian Flycatcher							
	Intercept	1.72	0.07	1.61 — 1.83	28.3	6.99 (7.17)		
	LndPercDec	1.07	0.10	0.92 — 1.22			92.66	1.8
	SpatEig10	-0.49	0.08	-0.62 — -0.36			27.41	1.1
	RegMaxTemp	0.44	0.10	0.30 — 0.59			17.82	1.6
	SpatEig3	-0.27	0.07	-0.39 — -0.15			10.73	1.0
	PercFemale	-0.06	0.08	-0.17 — 0.05			-1.39	1.1

Hairy Woodpecker							
Intercept	-0.04	0.08	-0.15 — 0.08	17.7	1.18 (1.20)		
LndPercDec	0.37	0.09	0.24 — 0.49			14.41	1.5
LndMaxTemp	-0.26	0.09	-0.40 — -0.11			6.72	1.4
IntLndTemFem	-0.13	0.07	-0.24 — -0.01			0.52	1.0
PercFemale	0.02	0.08	-0.09 — 0.14			-1.40	1.1
White-breasted Nuthatch							
Intercept	1.38	0.06	1.30 — 1.46	39.4	4.27 (4.42)		
LndPercDec	0.64	0.07	0.54 — 0.73			75.19	1.7
RegWinTemp	-0.64	0.14	-0.84 — -0.43			17.23	6.0
SpatEig39	0.22	0.05	0.14 — 0.30			15.19	1.1
SpatEig4	-0.17	0.05	-0.24 — -0.09			8.96	1.2
SpatEig1	-0.16	0.06	-0.24 — -0.09			7.35	1.3
RegSprPrec	0.11	0.06	0.02 — 0.20			1.23	1.4
RegMaxTemp	0.21	0.18	-0.04 — 0.47			-0.67	10.4
LndMaxTemp	-0.12	0.12	-0.31 — 0.06			-1.16	4.8
Yellow-breasted Chat							
Intercept	2.42	0.06	2.34 — 2.50	39.1	14.95 (15.60)		
SpatEig16	0.58	0.09	0.44 — 0.71			35.24	1.3
SpatEig18	0.31	0.06	0.23 — 0.40			28.10	1.1
LndMaxTemp	0.93	0.16	0.69 — 1.16			27.78	7.6
SpatEig1	-0.47	0.09	-0.59 — -0.35			27.53	1.3
LndPercDev	-0.42	0.09	-0.55 — -0.29			17.39	1.1
SpatEig11	-0.24	0.05	-0.32 — -0.16			15.05	1.1

SpatEig48	-0.31	0.05	-0.42 — -0.20			13.95	1.0
LndWinTemp	-0.25	0.16	-0.49 — -0.01			0.18	8.8
SpatEig37	0.07	0.05	-0.01 — 0.16			-0.72	1.1
RegPercMix	0.03	0.07	-0.08 — 0.13			-2.01	1.8
PercFemale	0.00	0.05	-0.08 — 0.08			-2.14	1.1
Ruby-throated Hummingbird							
Intercept	0.76	0.06	0.67 — 0.84	16.3	1.93 (1.98)		
SpatEig14	0.39	0.07	0.30 — 0.50			34.72	1.0
SpatEig13	0.26	0.06	0.17 — 0.35			16.27	1.1
SpatEig36	0.20	0.05	0.13 — 0.27			15.06	1.0
LndMaxTemp	-0.21	0.06	-0.30 — -0.13			10.22	1.1
SpatEig27	-0.20	0.05	-0.28 — -0.12			10.09	1.0
PercFemale	0.10	0.06	0.02 — 0.18			0.99	1.0
Northern Mockingbird							
Intercept	3.71	0.04	3.66 — 3.77	46.8	28.56 (31.05)		
SpatEig13	-0.30	0.04	-0.37 — -0.24			47.32	1.1
SpatEig49	0.36	0.05	0.27 — 0.45			41.20	1.4
SpatEig37	-0.35	0.04	-0.44 — -0.27			40.12	1.2
SpatEig47	-0.37	0.06	-0.47 — -0.28			37.09	1.4
LndWinTemp	0.74	0.13	0.55 — 0.94			26.10	9.5
SpatEig1	-0.22	0.05	-0.29 — -0.16			23.73	1.3
SpatEig40	-0.25	0.04	-0.32 — -0.18			23.64	1.1
SpatEig21	-0.22	0.04	-0.28 — -0.16			23.07	1.1
SpatEig16	-0.32	0.06	-0.42 — -0.23			21.47	1.5

	SpatEig12	-0.21	0.04	-0.27 — -0.14			18.29	1.2
	SpatEig36	-0.21	0.04	-0.29 — -0.14			15.64	1.1
	SpatEig5	-0.18	0.04	-0.25 — -0.12			15.52	1.2
	SpatEig4	-0.16	0.04	-0.23 — -0.10			13.60	1.0
	LndPercDec	-0.24	0.06	-0.33 — -0.14			10.61	2.0
	SpatEig82	-0.12	0.04	-0.18 — -0.07			10.23	1.0
	SpatEig54	0.16	0.04	0.09 — 0.23			10.07	1.1
	SpatEig23	0.10	0.04	0.05 — 0.16			4.95	1.0
	SpatEig26	-0.11	0.04	-0.18 — -0.05			4.60	1.0
	RegArea	0.09	0.06	0.01 — 0.17			0.09	2.0
	PercFemale	-0.03	0.04	-0.10 — 0.04			-1.90	1.1
	LndMaxTemp	-0.05	0.12	-0.23 — 0.12			-2.07	9.2
	Brown-headed Cowbird							
	Intercept	3.41	0.04	3.35 — 3.47	18.5	19.08 (19.52)		
	SpatEig45	0.32	0.04	0.25 — 0.39			40.46	1.0
	SpatEig17	-0.17	0.04	-0.23 — -0.12			20.00	1.0
	PercFemale	-0.14	0.04	-0.20 — -0.08			10.38	1.0
	SpatEig11	0.16	0.04	0.10 — 0.23			10.32	1.2
	SpatEig20	-0.14	0.04	-0.21 — -0.08			9.29	1.0
	IntRegTempFem	0.11	0.04	0.05 — 0.17			4.70	1.0
	RegMaxTemp	-0.02	0.04	-0.09 — 0.05			2.70	1.2
Percent college	*Kentucky Warbler*							
	Intercept	0.62	0.10	0.48 — 0.77	22.6	3.02 (3.14)		
	LndMaxTemp	0.70	0.12	0.50 — 0.90			24.62	1.6

SpatEig73	0.40	0.09	0.28 — 0.53			20.41	1.0
SpatEig9	0.53	0.11	0.36 — 0.71			15.90	1.1
PercCollege	-0.40	0.12	-0.57 — -0.23			15.15	1.1
SpatEig12	0.31	0.09	0.19 — 0.43			12.33	1.0
SpatEig2	-0.40	0.10	-0.57 — -0.24			12.08	1.4
SpatEig8	-0.34	0.09	-0.47 — -0.21			11.68	1.2
SpatEig11	-0.30	0.09	-0.42 — -0.18			10.16	1.0
SpatEig42	-0.22	0.09	-0.34 — -0.10			5.08	1.0
IntLndTemCol	0.32	0.14	0.12 — 0.52			3.43	1.1
Acadian Flycatcher							
Intercept	1.72	0.07	1.61 — 1.83	28.8	7.00 (7.18)		
LndPercDec	1.10	0.10	0.94 — 1.26			91.19	1.9
SpatEig10	-0.50	0.08	-0.63 — -0.36			27.97	1.1
RegMaxTemp	0.50	0.10	0.34 — 0.66			18.18	1.9
SpatEig3	-0.26	0.07	-0.39 — -0.15			10.11	1.0
PercCollege	0.08	0.08	-0.03 — 0.18			-0.98	1.2
Hairy Woodpecker							
Intercept	-0.02	0.08	-0.13 — 0.09	17.1	1.17 (1.19)		
LndPercDec	0.41	0.09	0.28 — 0.54			16.78	1.5
LndMaxTemp	-0.23	0.10	-0.38 — -0.07			2.41	1.6
PercCollege	0.08	0.09	-0.04 — 0.20			-1.15	1.2
White-breasted Nuthatch							
Intercept	1.38	0.06	1.30 — 1.46	39.2	4.32 (4.45)		

LndPercDec	0.73	0.07	0.63 — 0.83			95.30	1.8
PercCollege	0.25	0.05	0.18 — 0.33			21.81	1.2
SpatEig4	-0.17	0.05	-0.25 — -0.10			8.86	1.2
RegWinTemp	-0.50	0.14	-0.71 — -0.28			8.81	5.9
SpatEig7	-0.12	0.06	-0.21 — -0.03			1.87	1.2
RegSprPrec	0.12	0.06	0.03 — 0.21			1.66	1.4
LndMaxTemp	-0.17	0.12	-0.35 — -5.6E-04			-0.02	4.3
RegMaxTemp	0.24	0.18	-0.01 — 0.49			-0.23	10.1
Yellow-breasted Chat							
Intercept	2.42	0.06	2.34 — 2.51	43.9	14.66 (15.33)		
LndMaxTemp	0.86	0.16	0.64 — 1.09			28.76	7.8
SpatEig16	0.48	0.08	0.35 — 0.62			24.84	1.4
SpatEig18	0.29	0.06	0.20 — 0.38			22.10	1.1
SpatEig48	-0.32	0.05	-0.42 — -0.22			19.05	1.0
SpatEig11	-0.24	0.05	-0.32 — -0.16			15.95	1.1
LndPercDev	-0.37	0.10	-0.50 — -0.23			11.83	1.2
SpatEig1	-0.34	0.08	-0.47 — -0.21			11.53	1.3
PercCollege	-0.23	0.07	-0.34 — -0.12			9.80	1.2
SpatEig34	0.19	0.05	0.11 — 0.27			8.07	1.0
SpatEig37	0.13	0.05	0.05 — 0.22			2.70	1.1
IntLndTempCol	0.14	0.08	0.02 — 0.26			0.69	1.2
LndWinTemp	-0.11	0.16	-0.34 — 0.12			-1.67	9.1
RegPercMix	0.01	0.07	-0.09 — 0.11			-2.15	1.9

Ruby-throated Hummingbird							
Intercept	0.74	0.06	0.66 — 0.82	17.5	1.92 (1.96)		
SpatEig14	0.37	0.07	0.27 — 0.47			30.29	1.0
PercCollege	-0.31	0.07	-0.41 — -0.22			19.05	1.1
LndMaxTemp	-0.28	0.06	-0.37 — -0.19			18.27	1.2
SpatEig13	0.26	0.06	0.17 — 0.34			16.63	1.1
SpatEig36	0.18	0.05	0.11 — 0.25			11.49	1.0
Northern Mockingbird							
Intercept	3.71	0.04	3.65 — 3.77	47.2	28.37 (30.74)		
SpatEig37	-0.34	0.04	-0.42 — -0.27			40.87	1.2
SpatEig49	0.34	0.05	0.26 — 0.43			39.40	1.4
SpatEig47	-0.38	0.06	-0.47 — -0.29			38.98	1.5
SpatEig13	-0.27	0.04	-0.34 — -0.21			37.43	1.2
SpatEig21	-0.25	0.04	-0.31 — -0.19			30.49	1.1
SpatEig16	-0.37	0.06	-0.47 — -0.28			28.37	1.5
SpatEig40	-0.27	0.04	-0.34 — -0.20			27.41	1.1
LndWinTemp	0.73	0.12	0.53 — 0.92			25.32	8.8
PercCollege	0.21	0.04	0.14 — 0.27			21.13	1.2
SpatEig36	-0.22	0.04	-0.29 — -0.15			18.66	1.1
LndPercDec	-0.27	0.06	-0.36 — -0.17			14.10	2.0
SpatEig5	-0.17	0.04	-0.23 — -0.11			13.60	1.2
SpatEig43	-0.18	0.04	-0.25 — -0.11			13.11	1.0
SpatEig12	-0.17	0.04	-0.24 — -0.10			11.64	1.2
SpatEig4	-0.15	0.04	-0.21 — -0.08			10.13	1.0
SpatEig54	0.15	0.04	0.09 — 0.22			9.24	1.1

	SpatEig19	-0.12	0.04	-0.18 — -0.07			7.33	1.0
	SpatEig26	-0.11	0.04	-0.18 — -0.05			4.44	1.0
	RegArea	0.14	0.06	0.06 — 0.22			3.55	2.0
	SpatEig23	0.09	0.04	0.04 — 0.15			3.51	1.0
	LndMaxTemp	-0.17	0.12	-0.34 — -2.8E-03			-0.12	8.1
	Brown-headed Cowbird							
	Intercept	3.39	0.04	3.33 — 3.45	18.8	18.80 (19.11)		
	SpatEig45	0.33	0.04	0.26 — 0.40			41.00	1.0
	SpatEig5	0.19	0.04	0.13 — 0.24			18.39	1.0
	SpatEig17	-0.17	0.04	-0.22 — -0.11			17.48	1.0
	SpatEig11	0.18	0.04	0.12 — 0.25			14.83	1.0
	SpatEig20	-0.14	0.04	-0.20 — -0.08			8.90	1.0
Median age	*Kentucky Warbler*							
	Intercept	0.65	0.10	0.51 — 0.79	12.6	3.39 (3.52)		
	LndMaxTemp	0.93	0.12	0.74 — 1.13			42.75	1.5
	SpatEig2	-0.55	0.10	-0.72 — -0.40			29.29	1.3
	SpatEig8	-0.52	0.10	-0.65 — -0.38			27.68	1.2
	SpatEig73	0.39	0.10	0.26 — 0.52			17.23	1.0
	SpatEig9	0.53	0.11	0.34 — 0.72			13.49	1.1
	SpatEig15	0.31	0.09	0.18 — 0.44			8.58	1.0
	SpatEig42	-0.27	0.09	-0.39 — -0.15			8.39	1.0
	SpatEig12	0.27	0.09	0.14 — 0.40			7.20	1.0
	IntLndTempAge	0.09	0.10	-0.06 — 0.24			-1.46	1.1
	MedianAge	-0.03	0.10	-0.19 — 0.13			-1.46	1.1

Acadian Flycatcher							
Intercept	1.72	0.07	1.61 — 1.82	27.9	7.09 (7.27)		
LndPercDec	1.04	0.10	0.90 — 1.19			88.99	1.8
SpatEig10	-0.50	0.08	-0.63 — -0.37			28.73	1.1
RegMaxTemp	0.46	0.10	0.31 — 0.60			18.45	1.6
SpatEig3	-0.25	0.07	-0.38 — -0.13			8.76	1.0
MedianAge	0.13	0.08	0.01 — 0.24			0.37	1.1
Hairy Woodpecker							
Intercept	-0.02	0.08	-0.13 — 0.09	15.6	1.18 (1.20)		
LndPercDec	0.40	0.09	0.27 — 0.53			16.50	1.5
LndMaxTemp	-0.28	0.09	-0.42 — -0.13			5.44	1.4
MedianAge	-0.06	0.08	-0.18 — 0.06			-1.49	1.1
White-breasted Nuthatch							
Intercept	1.38	0.06	1.30 — 1.46	39.2	4.28 (4.44)		
LndPercDec	0.64	0.07	0.54 — 0.74			74.16	1.8
RegWinTemp	-0.66	0.14	-0.85 — -0.46			19.06	5.8
SpatEig39	0.22	0.05	0.14 — 0.30			15.04	1.1
SpatEig4	-0.17	0.05	-0.24 — -0.09			8.76	1.2
SpatEig1	-0.16	0.05	-0.24 — -0.09			7.60	1.3
RegSprPrec	0.11	0.06	0.02 — 0.20			1.23	1.4
RegMaxTemp	0.23	0.18	-0.02 — 0.48			-0.30	9.9
LndMaxTemp	-0.13	0.12	-0.31 — 0.06			-1.12	4.7
MedianAge	-0.02	0.06	-0.11 — 0.06			-1.96	1.1

Yellow-breasted Chat							
Intercept	2.44	0.06	2.36 — 2.52	40.5	14.95 (15.66)		
SpatEig16	0.57	0.09	0.43 — 0.70			33.97	1.4
SpatEig1	-0.48	0.09	-0.60 — -0.36			28.81	1.3
LndMaxTemp	0.90	0.16	0.66 — 1.14			28.80	7.9
SpatEig18	0.31	0.06	0.23 — 0.40			27.88	1.1
LndPercDev	-0.40	0.09	-0.53 — -0.27			15.86	1.2
SpatEig11	-0.24	0.05	-0.32 — -0.16			15.11	1.1
SpatEig48	-0.31	0.05	-0.42 — -0.2			14.83	1.0
IntLndTempAge	0.09	0.06	-4.5E-03 — 0.18			-0.29	1.1
LndWinTemp	-0.22	0.17	-0.46 — 0.01			-0.33	8.9
SpatEig37	0.07	0.05	-0.01 — 0.16			-0.70	1.1
MedianAge	0.02	0.06	-0.07 — 0.10			-1.54	1.2
RegPercMix	0.04	0.07	-0.07 — 0.14			-1.88	1.9
Ruby-throated Hummingbird							
Intercept	0.75	0.06	0.67 — 0.83	17.0	1.91 (1.95)		
SpatEig14	0.38	0.07	0.29 — 0.48			33.22	1.0
SpatEig36	0.21	0.05	0.14 — 0.28			16.65	1.0
SpatEig13	0.25	0.06	0.16 — 0.33			14.85	1.1
SpatEig27	-0.18	0.05	-0.27 — -0.10			8.45	1.0
LndMaxTemp	-0.19	0.06	-0.27 — -0.10			7.06	1.1
MedianAge	0.11	0.06	0.03 — 0.19			1.82	1.0
SpatEig32	0.10	0.05	0.02 — 0.18			1.51	1.0

Northern Mockingbird							
Intercept	3.74	0.04	3.68 — 3.80	36.2	31.47 (33.85)		
SpatEig37	-0.35	0.05	-0.43 — -0.28			39.52	1.2
SpatEig13	-0.28	0.04	-0.35 — -0.21			33.62	1.2
LndWinTemp	0.85	0.13	0.65 — 1.04			33.56	8.8
SpatEig49	0.30	0.05	0.22 — 0.38			28.32	1.1
SpatEig47	-0.32	0.05	-0.41 — -0.24			27.29	1.2
SpatEig1	-0.22	0.05	-0.29 — -0.16			23.10	1.3
SpatEig21	-0.21	0.04	-0.27 — -0.15			19.84	1.1
SpatEig40	-0.24	0.04	-0.33 — -0.16			16.74	1.1
SpatEig4	-0.16	0.04	-0.22 — -0.10			15.90	1.1
SpatEig16	-0.28	0.06	-0.37 — -0.18			14.84	1.5
SpatEig12	-0.20	0.05	-0.27 — -0.13			14.49	1.3
SpatEig36	-0.18	0.04	-0.25 — -0.11			11.05	1.1
MedianAge	-0.14	0.05	-0.21 — -0.07			5.79	1.2
SpatEig39	0.12	0.04	0.05 — 0.18			4.34	1.2
SpatEig23	0.10	0.04	0.04 — 0.15			3.76	1.0
SpatEig26	-0.10	0.04	-0.17 — -0.04			3.10	1.0
LndPercDec	-0.11	0.06	-0.21 — -0.02			0.85	1.9
RegArea	0.04	0.06	-0.05 — 0.13			-1.89	2.2
LndMaxTemp	-0.07	0.13	-0.25 — 0.11			-1.91	8.9
Brown-headed Cowbird							
Intercept	3.42	0.04	3.37 — 3.48	18.2	19.22 (19.74)		
SpatEig45	0.33	0.04	0.26 — 0.41			38.30	1.0
SpatEig5	0.19	0.04	0.14 — 0.25			19.29	1.1

	SpatEig17	-0.17	0.04	-0.23 — -0.11			18.13	1.0
	MedianAge	-0.12	0.04	-0.18 — -0.06			13.61	1.1
	RegMaxTemp	-0.10	0.04	-0.16 — -0.03			13.41	1.1
	IntRegTempAge	0.16	0.04	0.10 — 0.23			11.18	1.0
	SpatEig20	-0.16	0.04	-0.23 — -0.09			8.26	1.0
Median income	*Kentucky Warbler*							
	Intercept	0.94	0.11	0.78 — 1.19	11.0	3.30 (3.39)		
	MedianInc	-0.31	0.15	-0.52 — -0.19			30.58	1.3
	SpatEig9	0.57	0.11	0.39 — 0.75			23.45	1.0
	SpatEig11	-0.35	0.09	-0.47 — -0.24			17.58	1.0
	LndMaxTemp	0.50	0.12	0.29 — 0.71			16.63	1.6
	IntLndTempInc	0.78	0.17	0.51 — 1.05			14.30	1.2
	SpatEig12	0.33	0.10	0.20 — 0.47			11.61	1.1
	SpatEig2	-0.31	0.10	-0.49 — -0.15			6.40	1.2
	Acadian Flycatcher							
	Intercept	1.73	0.08	1.62 — 1.84	30.1	7.01 (7.13)		
	LndPercDec	1.23	0.10	1.07 — 1.41			99.88	2.0
	SpatEig10	-0.55	0.08	-0.67 — -0.43			45.31	1.1
	RegMaxTemp	0.64	0.11	0.47 — 0.82			27.19	2.1
	MedianInc	0.21	0.08	0.10 — 0.31			7.09	1.3
	Hairy Woodpecker							
	Intercept	0.06	0.09	-0.06 — 0.18	17.1	1.16 (1.18)		
	LndPercDec	0.38	0.10	0.24 — 0.53			12.43	1.8

LndMaxTemp	-0.19	0.10	-0.35 — -0.02			3.39	1.7
MedianInc	0.23	0.10	0.09 — 0.38			3.08	1.5
IntLndTemInc	0.27	0.13	0.09 — 0.45			2.74	1.5
White-breasted Nuthatch							
Intercept	1.38	0.05	1.30 — 1.46	42.3	4.21 (4.31)		
LndPercDec	0.73	0.07	0.63 — 0.83			94.82	1.8
MedianInc	0.27	0.06	0.19 — 0.35			25.20	1.3
RegWinTemp	-0.53	0.13	-0.72 — -0.34			13.17	5.2
SpatEig4	-0.16	0.05	-0.24 — -0.09			8.31	1.2
RegSprPrec	0.15	0.06	0.06 — 0.23			3.73	1.4
RegMaxTemp	0.22	0.17	-0.02 — 0.46			-0.34	9.6
LndMaxTemp	-0.12	0.12	-0.30 — 0.06			-1.17	4.5
Yellow-breasted Chat							
Intercept	2.50	0.06	2.41 — 2.59	43.8	14.28 (15.07)		
LndMaxTemp	1.09	0.15	0.88 — 1.30			57.21	7.0
MedianInc	-0.38	0.08	-0.50 — -0.26			38.92	1.3
SpatEig48	-0.39	0.06	-0.49 — -0.29			28.59	1.1
SpatEig16	0.49	0.08	0.36 — 0.63			28.22	1.4
SpatEig11	-0.26	0.05	-0.34 — -0.17			16.93	1.1
SpatEig18	0.24	0.06	0.15 — 0.32			14.31	1.1
SpatEig34	0.23	0.05	0.15 — 0.31			13.95	1.1
IntLndTempInc	0.38	0.09	0.24 — 0.52			13.09	1.3
SpatEig40	0.15	0.05	0.08 — 0.22			7.09	1.0
SpatEig10	-0.15	0.05	-0.24 — -0.07			5.46	1.1

LndPercDev	-0.26	0.10	-0.40 — -0.12			4.59	1.3
SpatEig37	0.16	0.05	0.07 — 0.24			4.39	1.1
SpatEig4	0.10	0.05	0.03 — 0.18			2.35	1.1
LndWinTemp	-0.26	0.16	-0.48 — -0.04			0.69	8.8
RegPercMix	-0.03	0.07	-0.13 — 0.07			-2.00	1.8
Ruby-throated Hummingbird							
Intercept	0.90	0.06	0.81 — 1.00	11.1	1.90 (1.93)		
SpatEig14	0.31	0.06	0.21 — 0.40			21.31	1.0
MedianInc	-0.15	0.08	-0.26 — -0.04			19.33	1.3
LndMaxTemp	-0.14	0.06	-0.23 — -0.04			17.37	1.3
IntLndTempInc	0.33	0.09	0.19 — 0.47			9.89	1.2
Northern Mockingbird							
Intercept	3.71	0.04	3.65 — 3.77	45.7	28.65 (30.95)		
SpatEig37	-0.37	0.04	-0.45 — -0.29			47.75	1.2
SpatEig47	-0.38	0.06	-0.47 — -0.29			39.47	1.5
SpatEig13	-0.28	0.04	-0.34 — -0.21			39.22	1.2
SpatEig49	0.32	0.05	0.24 — 0.41			35.03	1.4
LndWinTemp	0.79	0.12	0.60 — 0.99			31.17	8.8
SpatEig21	-0.25	0.04	-0.31 — -0.19			30.82	1.1
SpatEig40	-0.25	0.04	-0.33 — -0.18			24.64	1.1
MedianInc	0.22	0.05	0.16 — 0.29			23.15	1.4
SpatEig16	-0.33	0.06	-0.43 — -0.24			22.39	1.5
SpatEig36	-0.22	0.04	-0.29 — -0.15			19.60	1.1
SpatEig12	-0.19	0.04	-0.25 — -0.13			15.84	1.2

SpatEig5	-0.18	0.04	-0.24 — -0.11			15.62	1.2
SpatEig43	-0.17	0.04	-0.23 — -0.10			11.90	1.0
SpatEig4	-0.15	0.04	-0.21 — -0.09			11.41	1.0
SpatEig82	-0.13	0.04	-0.18 — -0.08			10.67	1.0
SpatEig54	0.16	0.04	0.10 — 0.23			10.54	1.1
LndPercDec	-0.22	0.06	-0.31 — -0.12			8.59	2.2
SpatEig23	0.11	0.04	0.06 — 0.17			6.05	1.0
SpatEig26	-0.12	0.04	-0.18 — -0.06			5.27	1.0
RegArea	0.14	0.06	0.06 — 0.23			3.79	2.1
LndMaxTemp	-0.13	0.12	-0.30 — 0.04			-0.97	8.2
Brown-headed Cowbird							
Intercept	3.36	0.04	3.29 — 3.42	19.8	18.61 (19.09)		
SpatEig45	0.32	0.04	0.25 — 0.39			41.29	1.0
SpatEig5	0.18	0.04	0.12 — 0.24			16.78	1.1
SpatEig17	-0.16	0.04	-0.22 — -0.10			15.62	1.0
SpatEig11	0.19	0.04	0.12 — 0.26			14.58	1.2
SpatEig20	-0.14	0.04	-0.21 — -0.08			8.17	1.1
MedianInc	0.06	0.05	-0.01 — 0.13			4.42	1.3
IntRegTempInc	-0.09	0.05	-0.16 — -0.02			0.98	1.2
RegMaxTemp	0.01	0.05	-0.06 — 0.08			-1.00	1.3

† The best-supported model among a set of competing models was the model with the lowest AIC_c value. There were 32 sets of competing models, one for each combination of 8 species and 4 socioeconomic variables.

‡ See Table 2 in the main text for definitions of explanatory variables.

§ R^2_{COR} was the squared correlation between observed and predicted relative abundance (Cameron and Trivedi 2013).

| Mean absolute error (MAE) of predictions for fitted model; MAE (predicted) is for leave-one-out cross validation.

¶ ΔAIC_c is the difference in AIC_c values between the best-supported model and the reduced model in which the variable of interest was removed (Coppes et al. 2017). Within a model, variables with larger ΔAIC_c values were more influential than were those with smaller ΔAIC_c values; negative ΔAIC_c values indicate that the reduced model had a better fit than did the best model, implying that the associated variable was not influential.

SpatEig = spatial eigenvector.

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