Appendix 8. Model results for species-area relationships in cities, species-area relationships in random polygon patches, and for the comparison between the two.

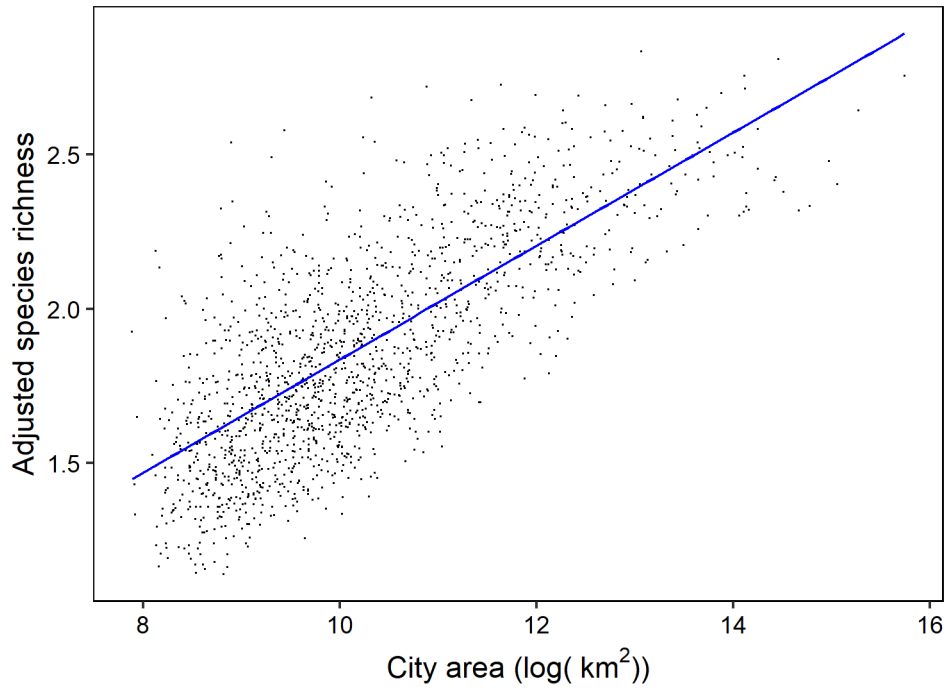

Figure A1. Adjusted species richness after accounting for the total number of eBird lists in a city using weights, and a smoothed 2-dimensional spline for latitude and longitude, to account for gradients in species richness, as a result of a Generalized Additive Model. The plot was made using the mgcViz package in R.

Table A1. Model results from a Generalized Additive Model for the species-area relationship for cities (i.e., area).

```
Family: poisson
Link function: log

Formula:
total_richness ~ log(area) + s(lat, lng, bs = "sos", m = 2, k = 100)

Parametric coefficients:
                  Estimate Std. Error z value Pr(>|z|)
(Intercept)       3.2529728  0.0056347   577.3   <2e-16 ***
log(area)         0.1836739  0.0005172   355.1   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Approximate significance of smooth terms:
             edf Ref.df Chi.sq p-value
s(lat,lng) 98.45     99  29255  <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

R-sq.(adj) =  0.664   Deviance explained = 65.1%
UBRE = 55.205  Scale est. = 1         n = 1581
```

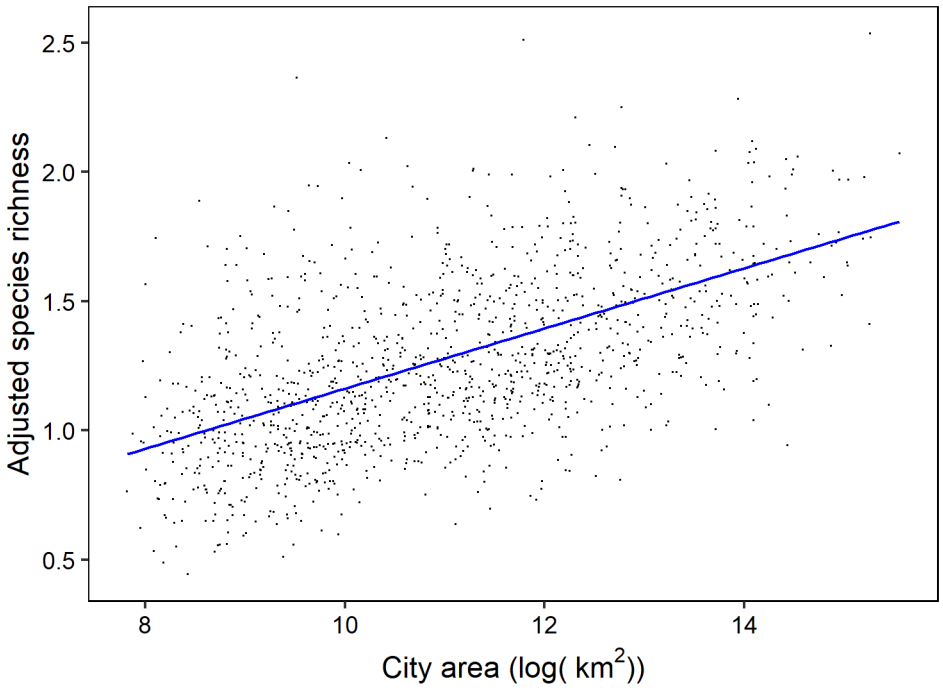

Figure A2. Adjusted species richness after accounting for the total number of eBird lists in a random polygon patch using weights, and a smoothed 2-dimensional spline for latitude and longitude, to account for gradients in species richness, as a result of a Generalized Additive Model. The plot was made using the mgcViz package in R.

Table A2. Model results from a Generalized Additive Model for the species-area relationship among random polygon patches.

```
Family: poisson
Link function: log

Formula:
total_richness ~ log(area) + s(lat, lng, bs = "sos", m = 2, k = 100)

Parametric coefficients:
             Estimate Std. Error z value Pr(>|z|)
(Intercept) 3.7487292  0.0068680   545.8   <2e-16 ***
log(area)   0.1162127  0.0005945   195.5   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Approximate significance of smooth terms:
            edf Ref.df Chi.sq p-value
s(lat,lng) 98.45     99  21582  <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

R-sq.(adj) =  0.362   Deviance explained = 39.2%
UBRE = 65.205  Scale est. = 1         n = 1284
```

Table A3. Model results from a Generalized Additive Model which assessed the interaction between log-transformed patch area and 'analysis', explicitly testing the difference in slope between cities and random polygon patches.

```
Family: poisson
Link function: log

Formula:
total_richness ~ log(area) * Analysis + s(lat, lng, bs = "sos", m = 2, k = 100)

Parametric coefficients:
                               Estimate Std. Error z value Pr(>|z|)
(Intercept)                   3.3346667  0.0054065  616.79   <2e-16 ***
log(area)                     0.1762309  0.0004931  357.42   <2e-16 ***
AnalysisRandom                0.4830444  0.0085692   56.37   <2e-16 ***
log(area):AnalysisRandom     -0.0656888  0.0007570  -86.78   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Approximate significance of smooth terms:
            edf Ref.df Chi.sq p-value
s(lat,lng) 98.41     99  36394  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

R-sq.(adj) =  0.562   Deviance explained =   54%
UBRE = 64.908  Scale est. = 1         n = 2865
```