Supporting Information

Table S1. Key for parameter names in the following Tables and Figures.

Parameter	Covariate Group/ Variable	Description
Survey		
Day_of_Year.Scaled	Day of Year	Day of the year (not Julian Date)
Day_Lat.Scaled	Day of Year × Latitude	Interaction between days since Jan-1 and site latitude
Hectares.Scaled	Wetland area	Total area (in hectares) of surveyed wetland
Forage		
PrefPlants.Scaled	Preferred plant density	Ordinal, representing density of plants identified as preferred waterfowl food
Annuals.Scaled	Annual plant cover	Percentage of total survey area that is covered by annual plants
Perennials.Scaled	Perennial plant cover	Percentage of total survey area that is covered by perennial plants
StemDen.Scaled	Total stem density	Ordinal, stem density of dominant plants
SeedHead.Scaled	Seed head density	Ordinal, density of seed heads per unit area
Habitat		
Depth#.Scaled	Water depth	Percentage of wetland in each of six water depth categories
OpenWater.Scaled	Open water	Percentage of total survey area that is open water
Height#.Scaled	Plant height	Percentage of total vegetative cover in each of seven height categories
Intersprsn.Scaled	Interspersion	Ordinal, level of interspersion between vegetated and non-vegetated areas
EdgeDist.Scaled	Percent near edge	Percentage of total survey area within 50 m of tall (10 m) trees

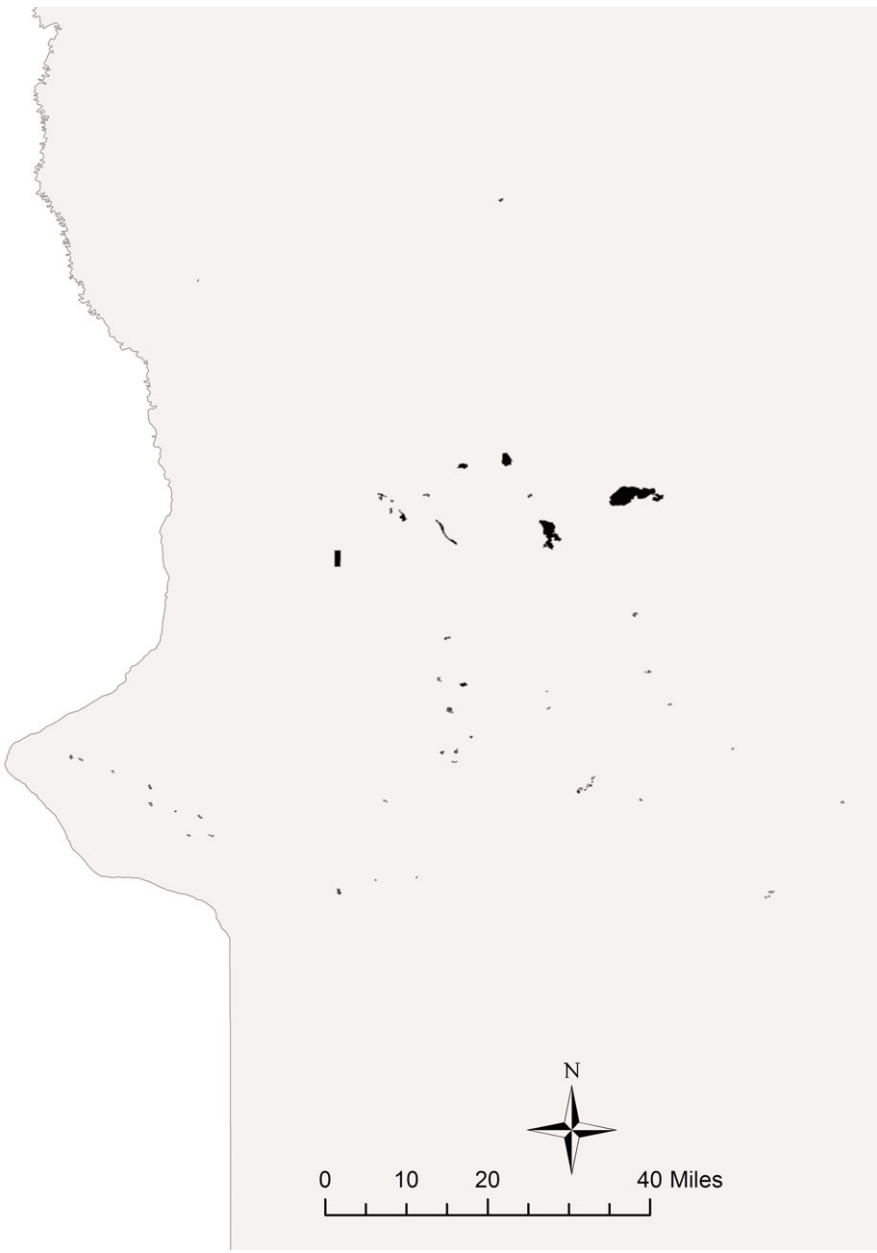


Figure S1. Zoomed-in view of survey units in western-Minnesota, showing actual size of units, to exemplify the relative-area nature of Figure 1 in the manuscript.

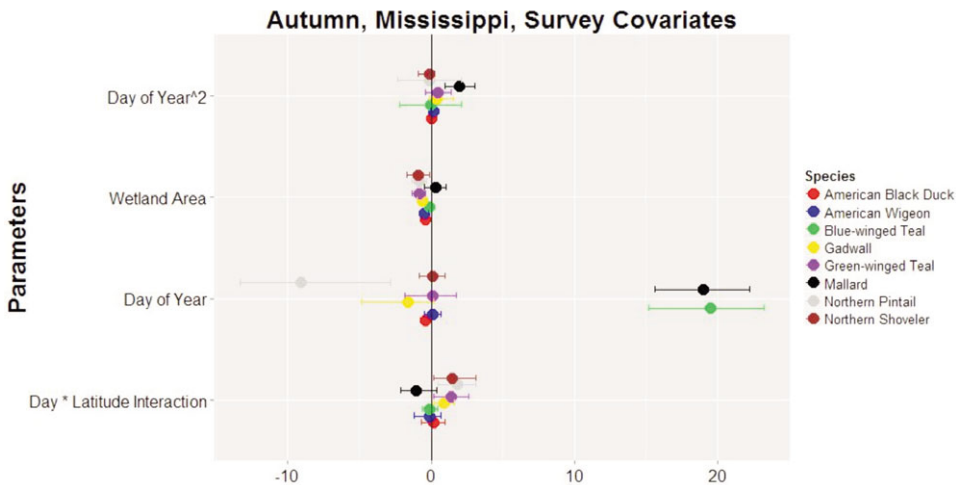


Figure S2. Posterior credible intervals (C.I.) for each individual parameter for each species during autumn migration in the Mississippi flyway, for the survey-only model. All other modelling domains follow as Fig. S3–S17.

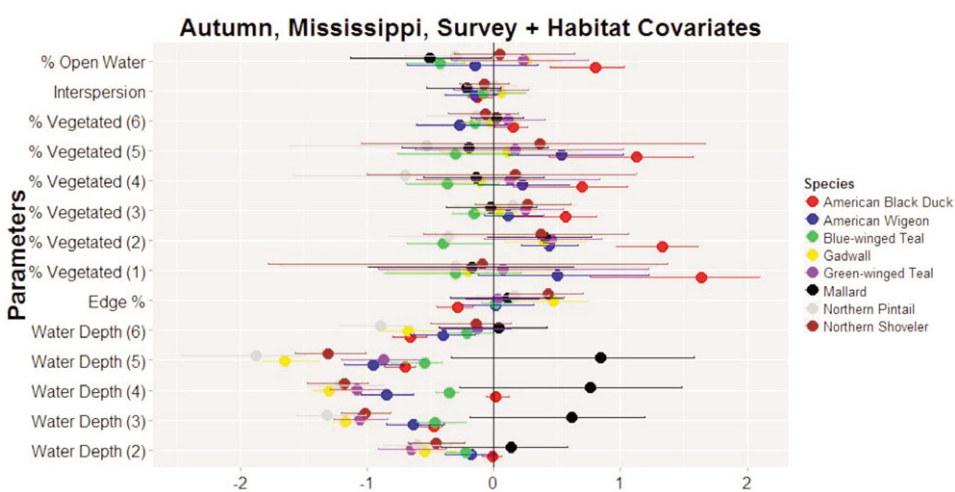


Figure S3.

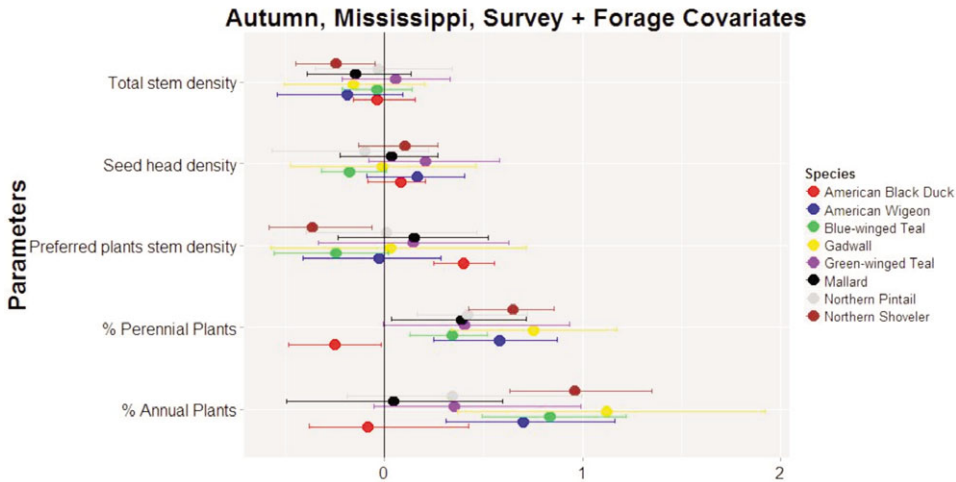


Figure S4.

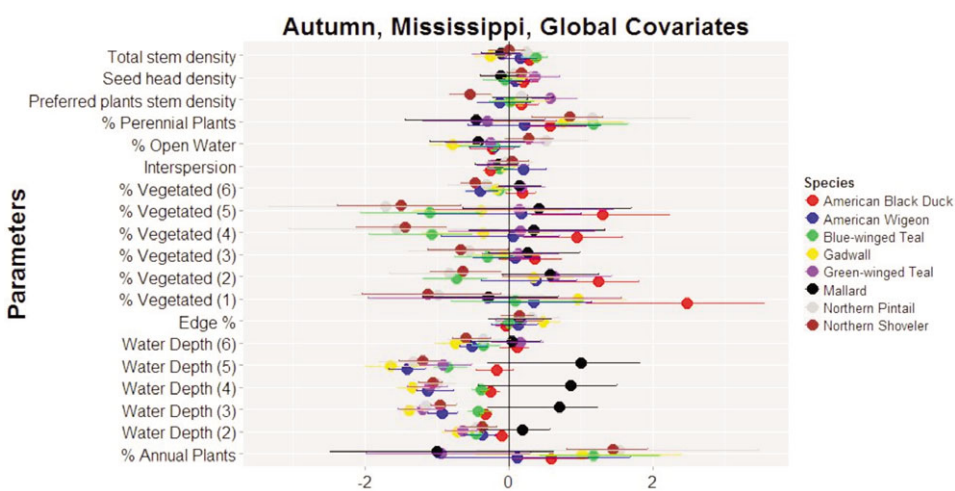


Figure S5.

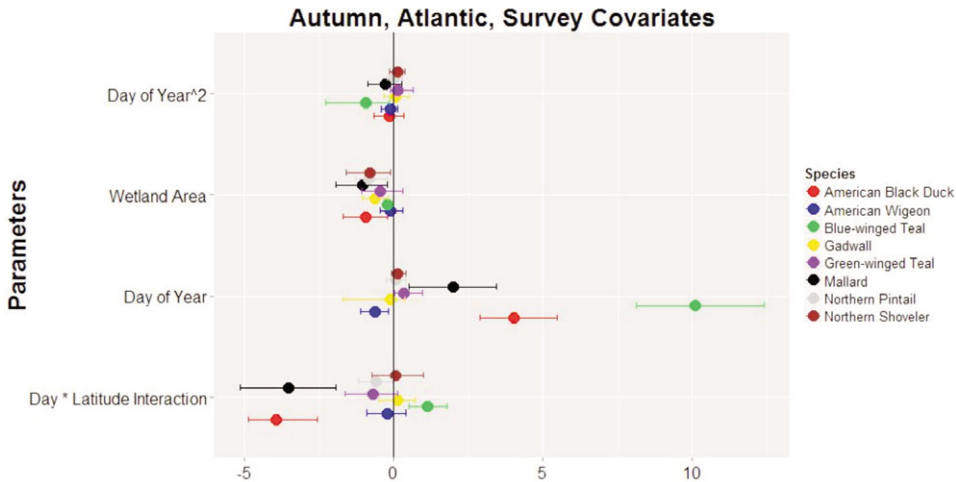
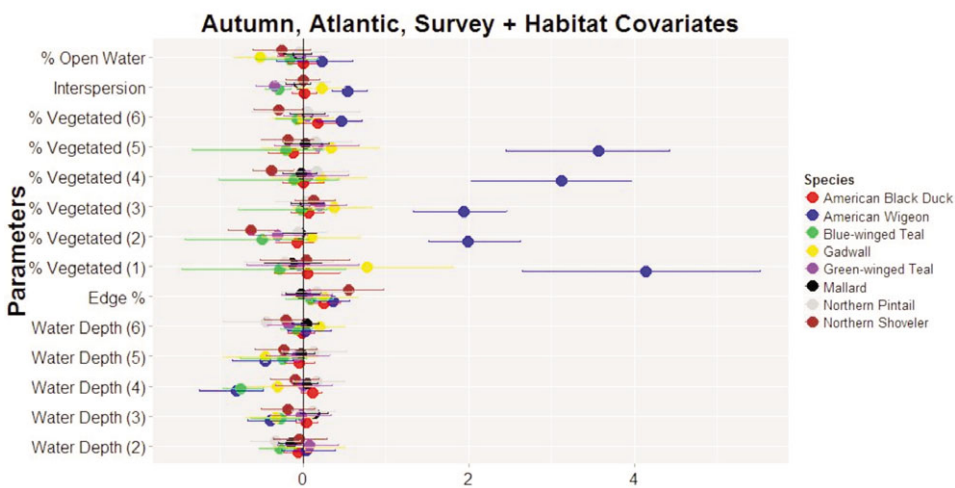


Figure S6.



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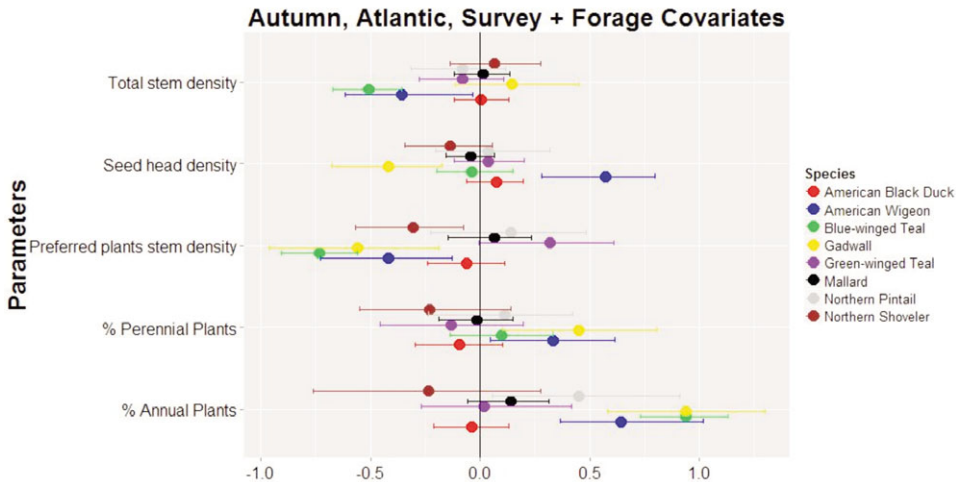

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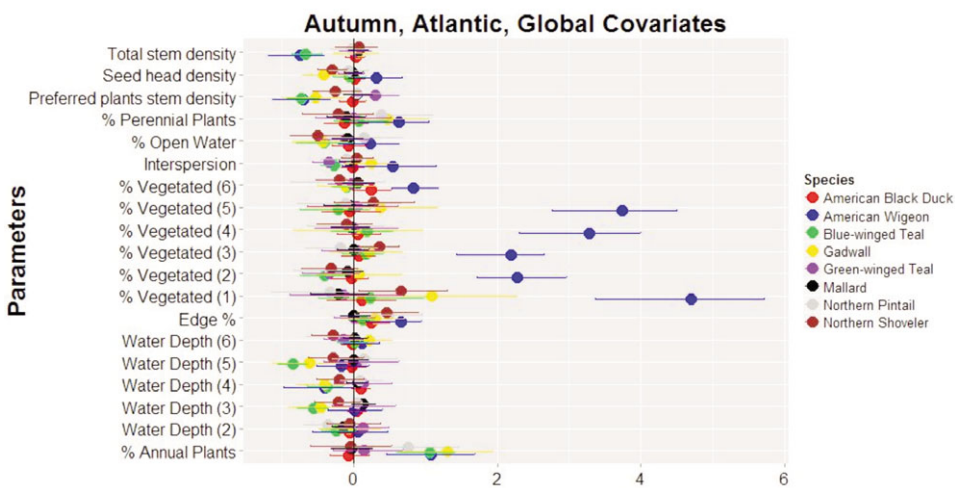

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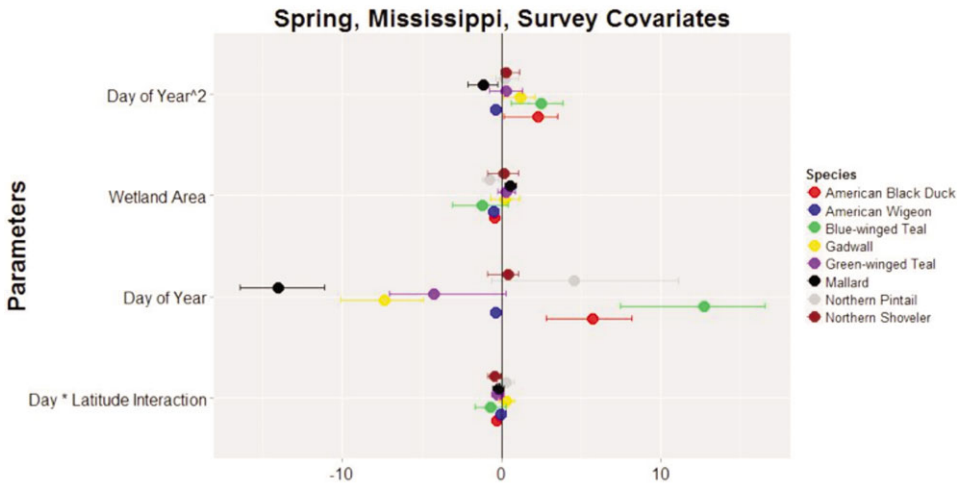

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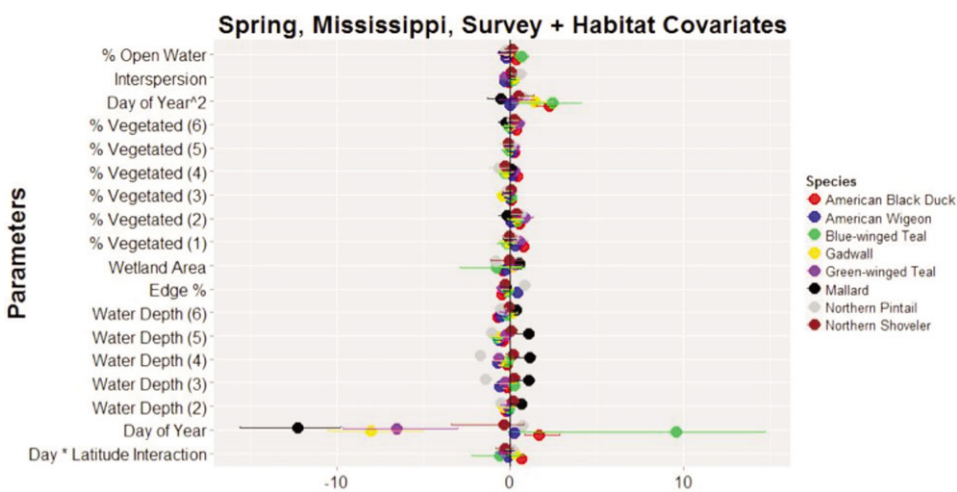

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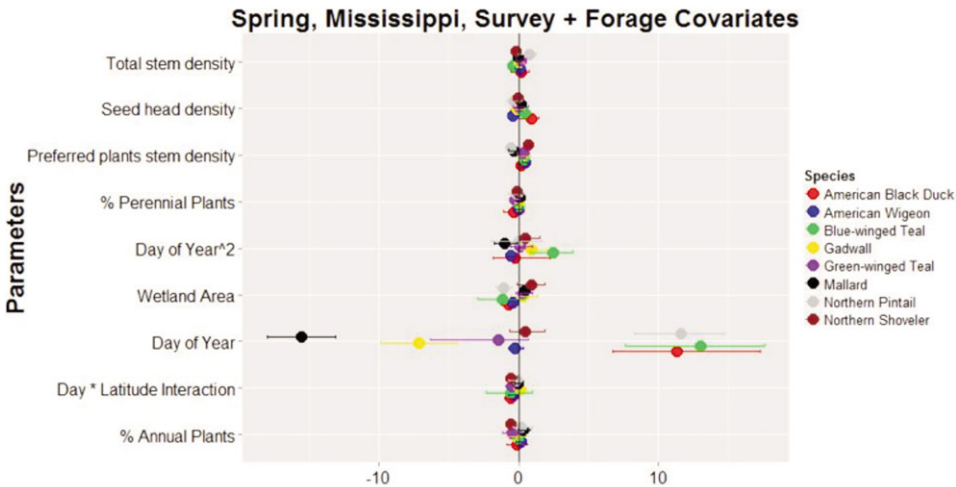

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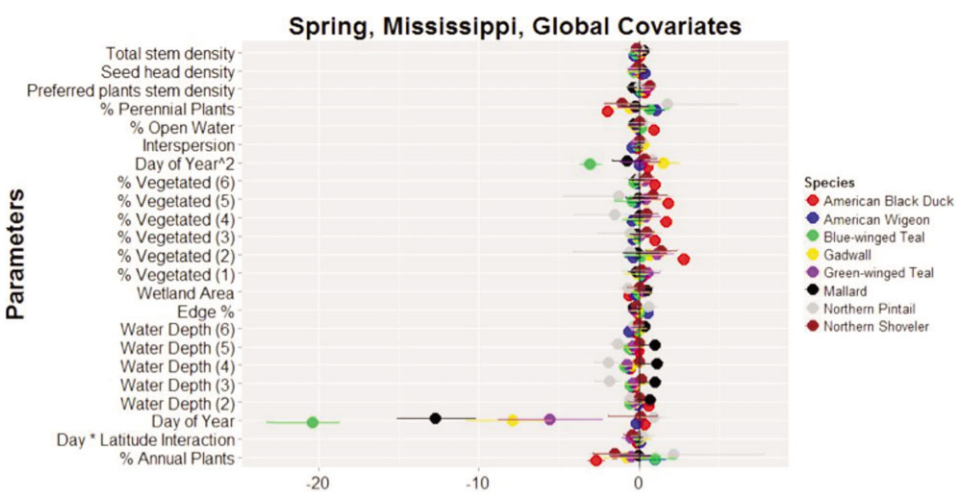

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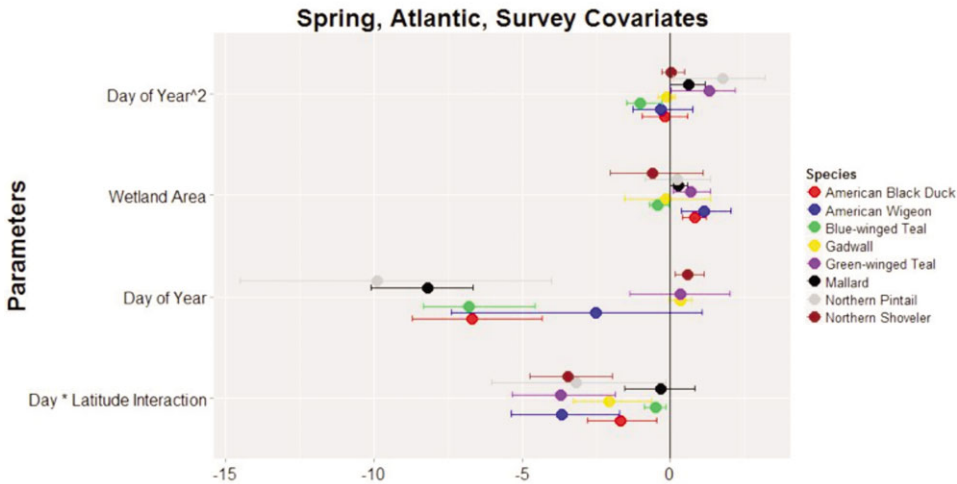

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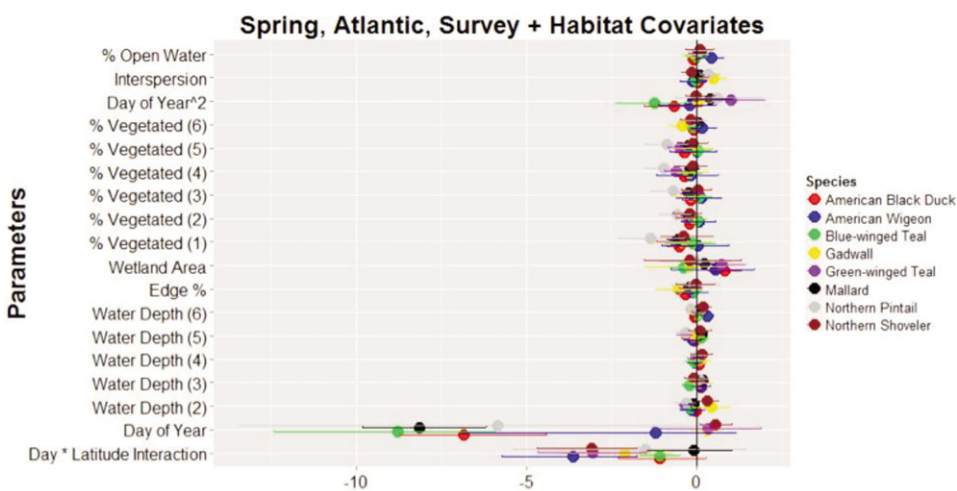

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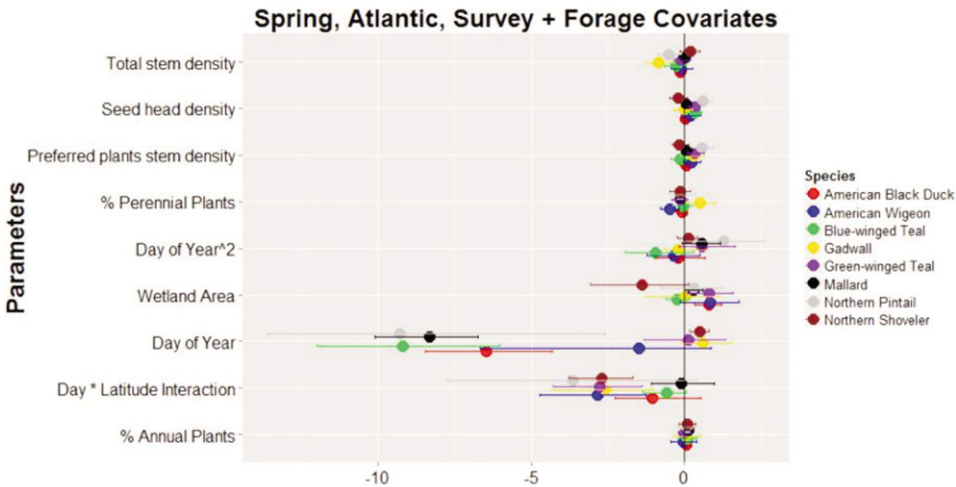

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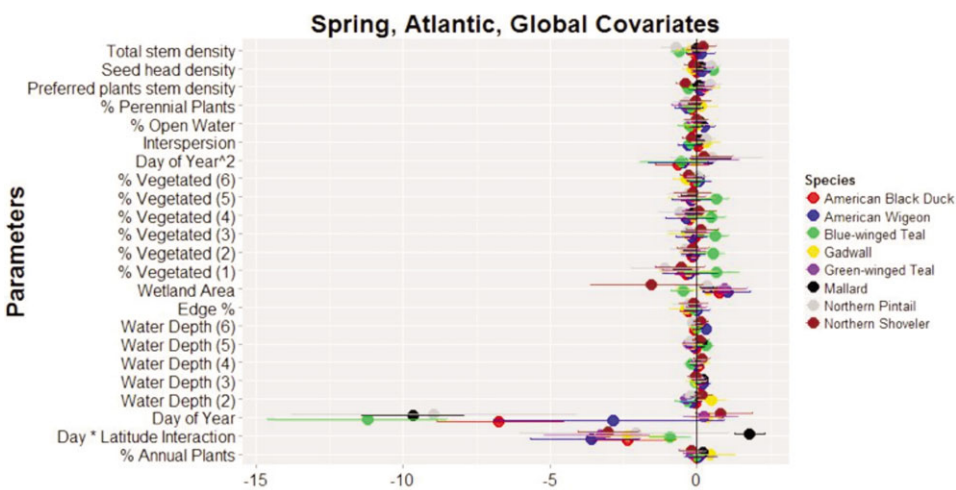

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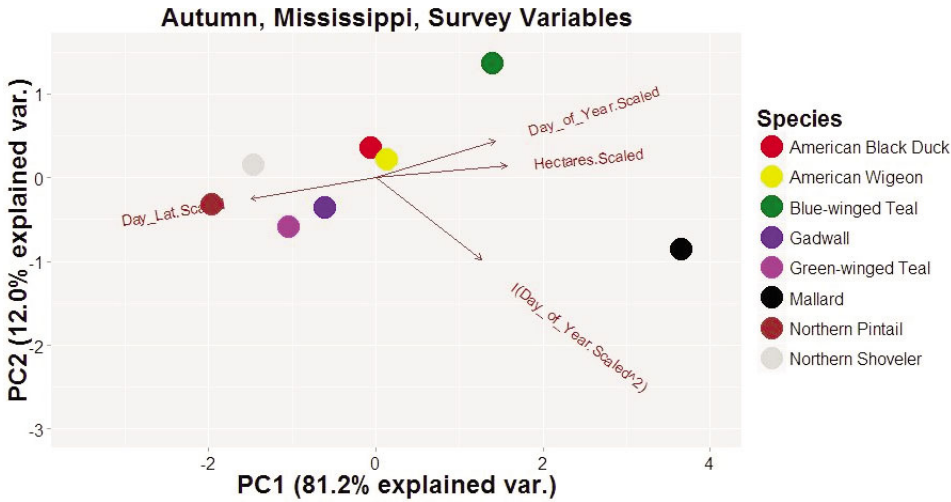
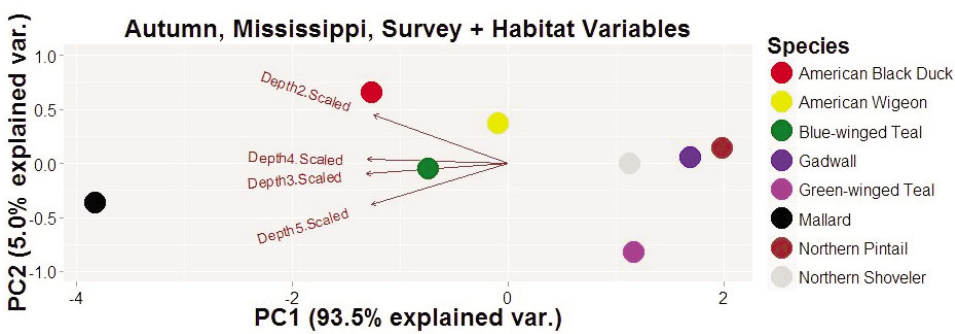


Figure S18. Principal component analysis for individual parameter importance for each species. Here, we show the results in the Mississippi flyway, during autumn migration, for the survey-only model. The other modelling domains follow as Figs. S19–S33.



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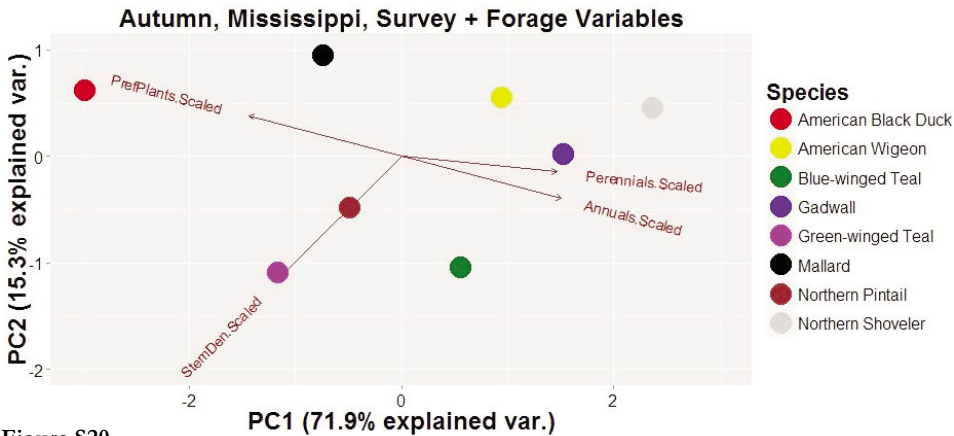

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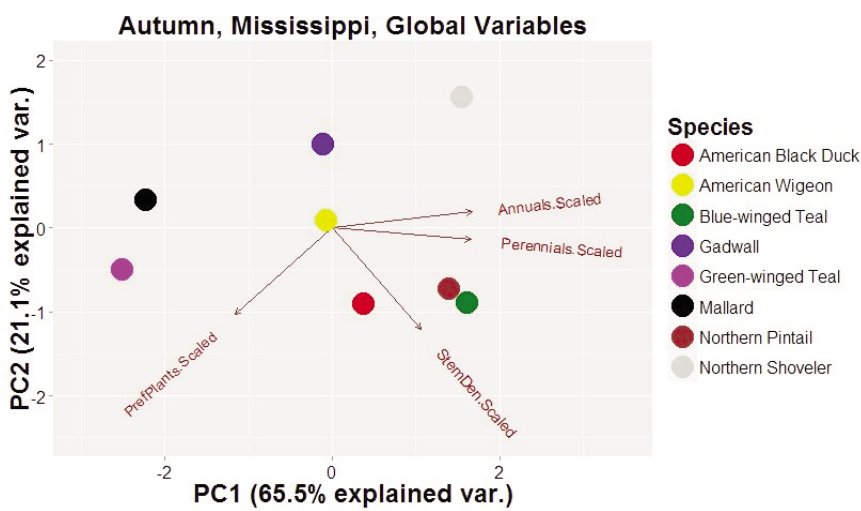

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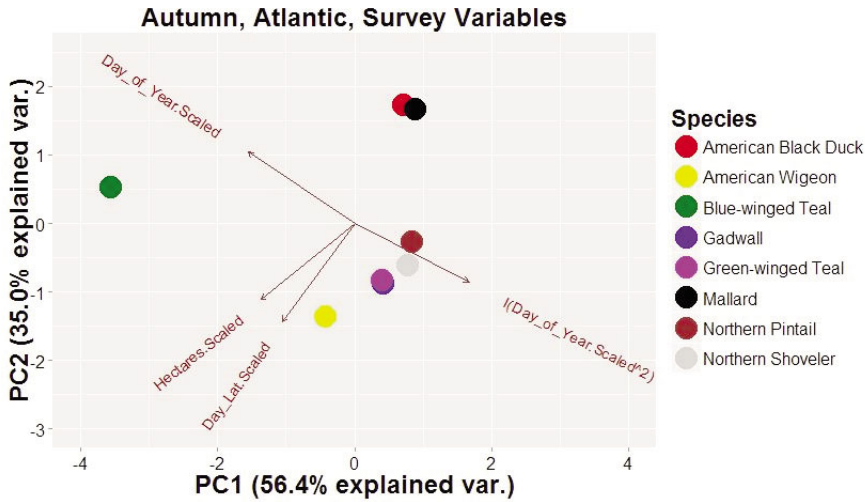

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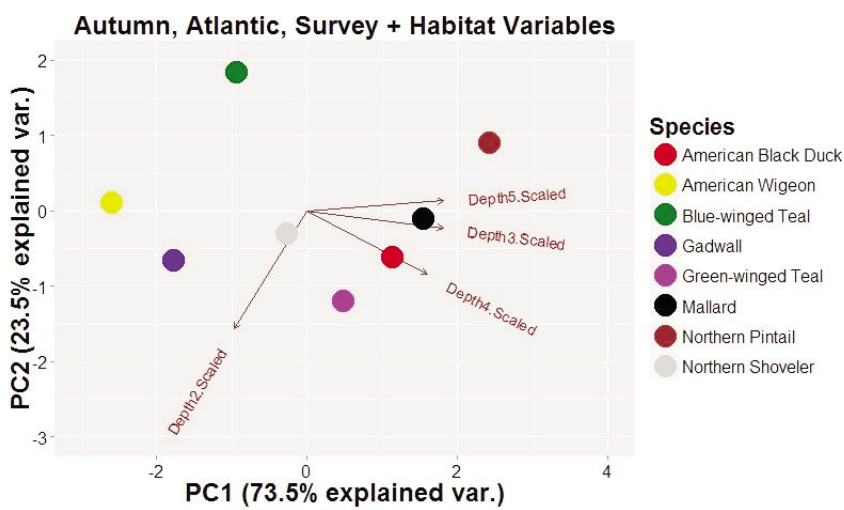

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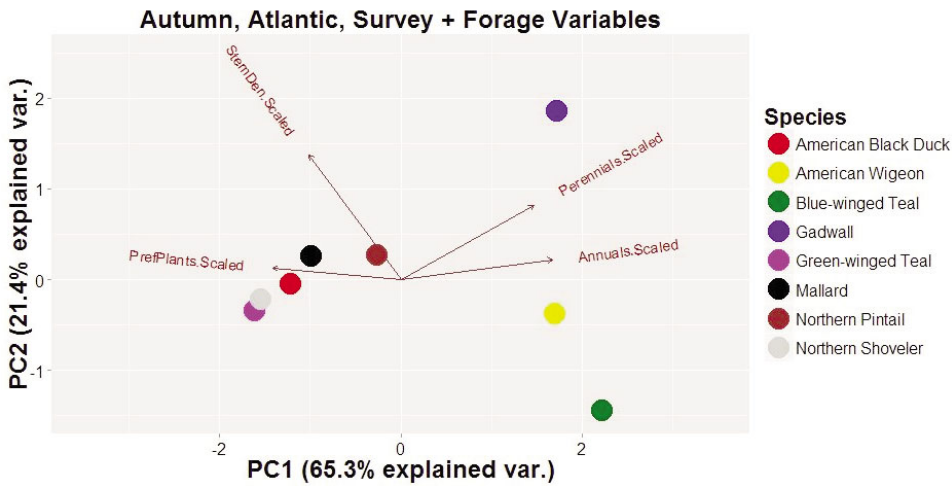

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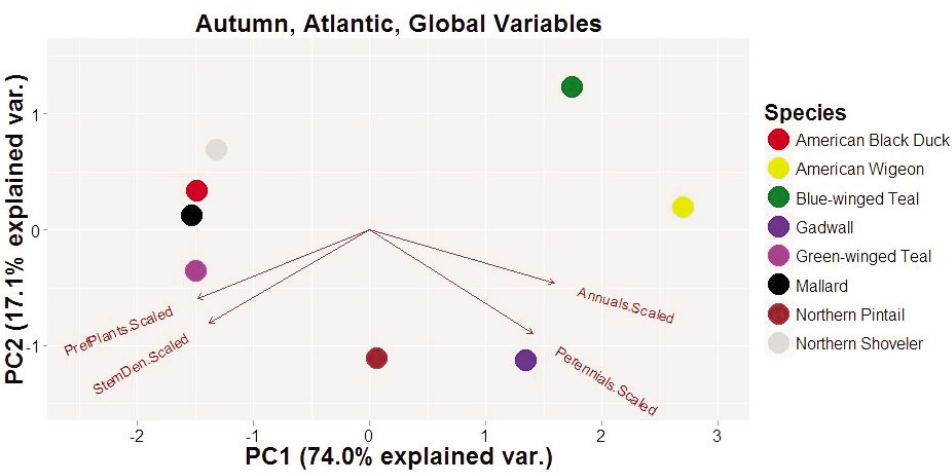

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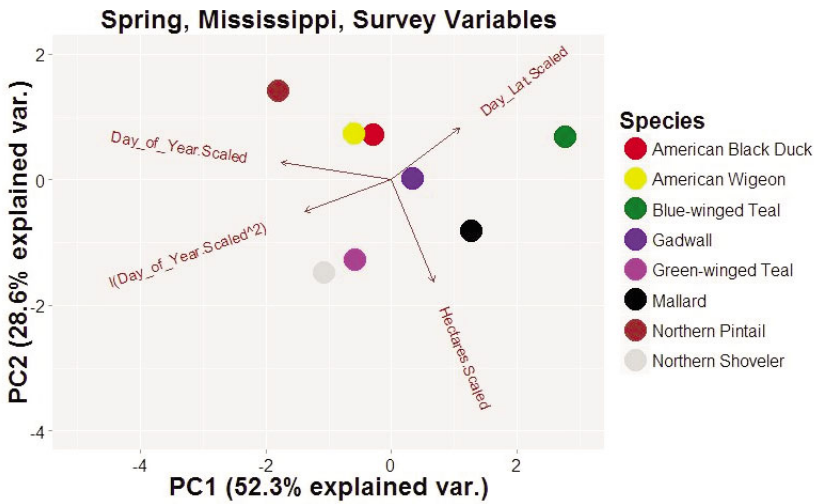

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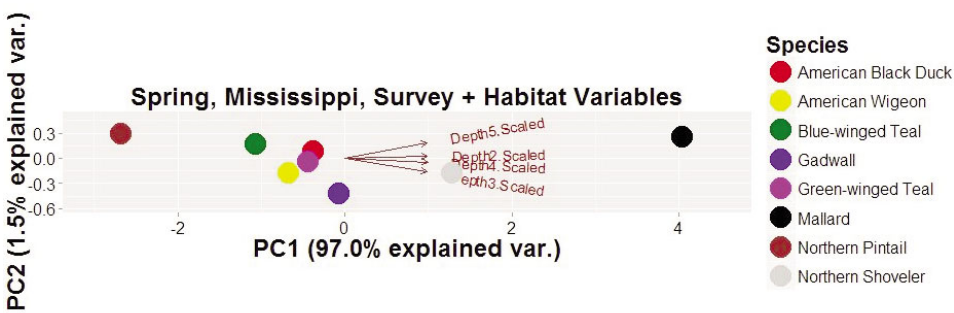

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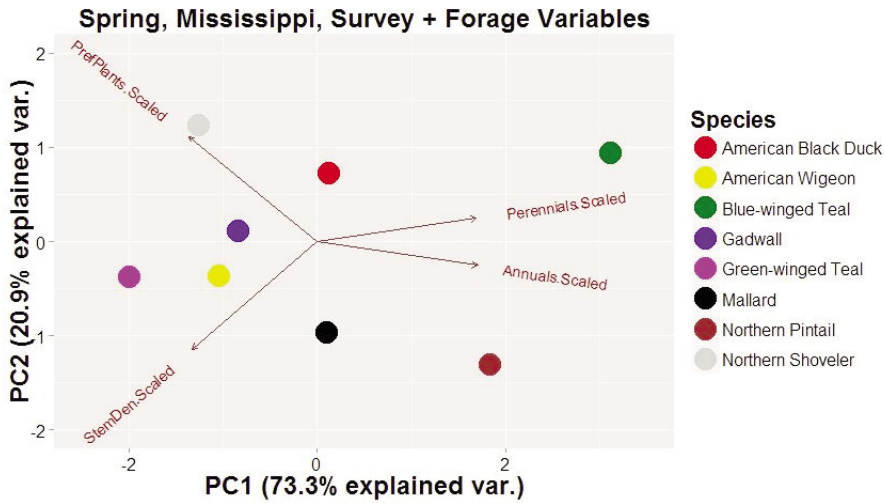

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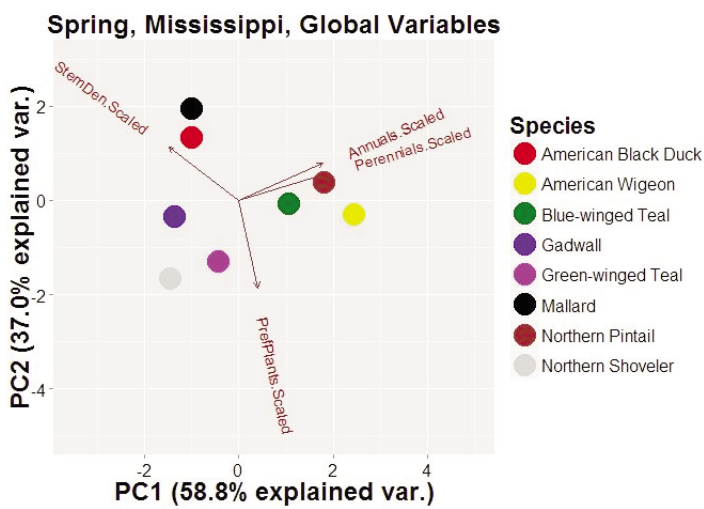

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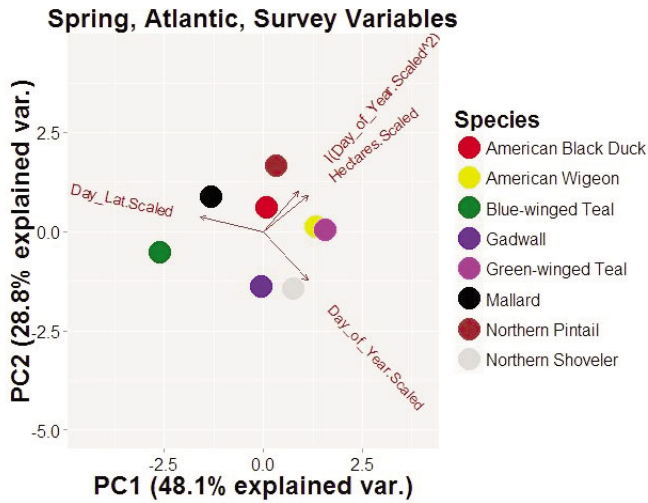

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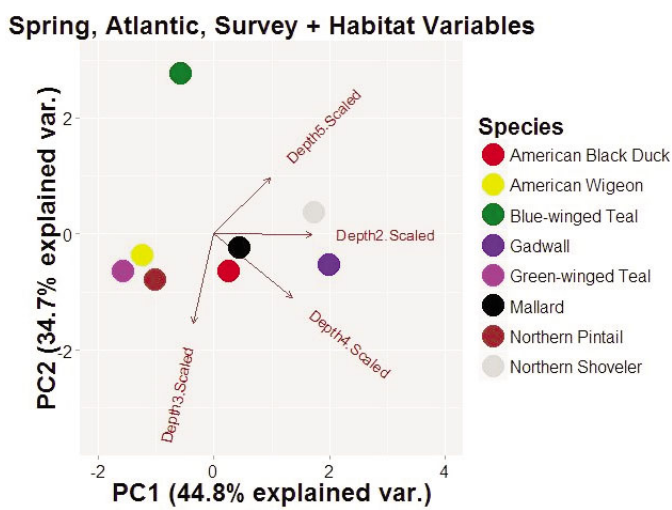

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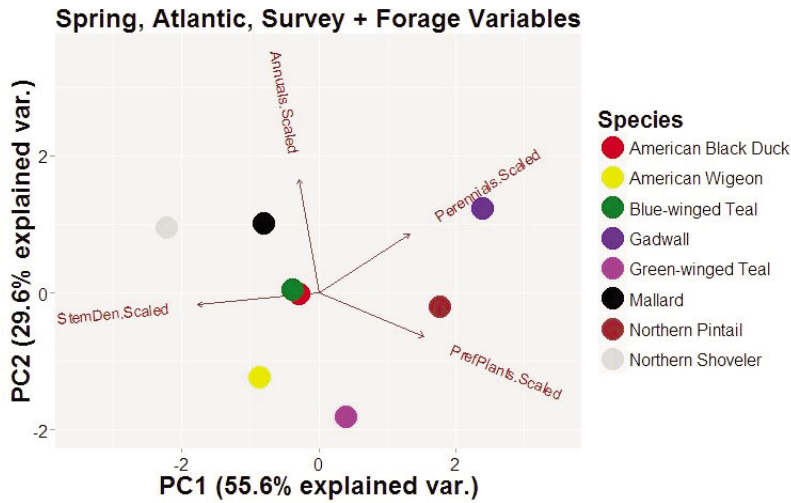

Figure S32.

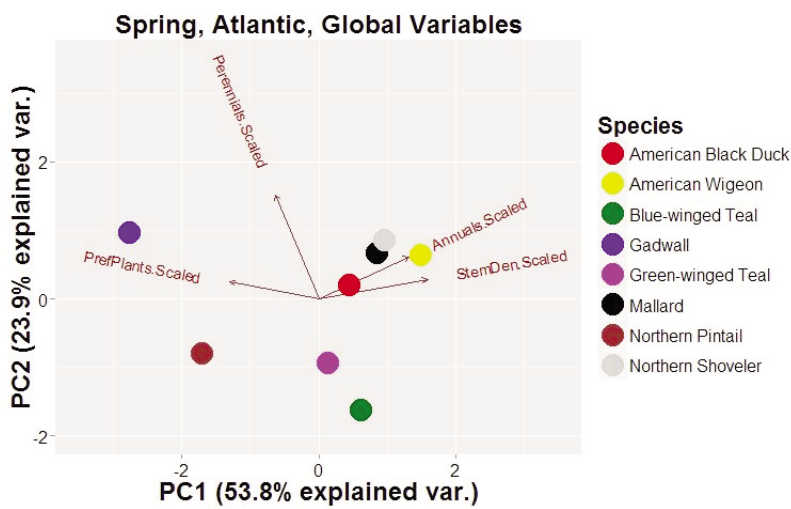

Figure S33.

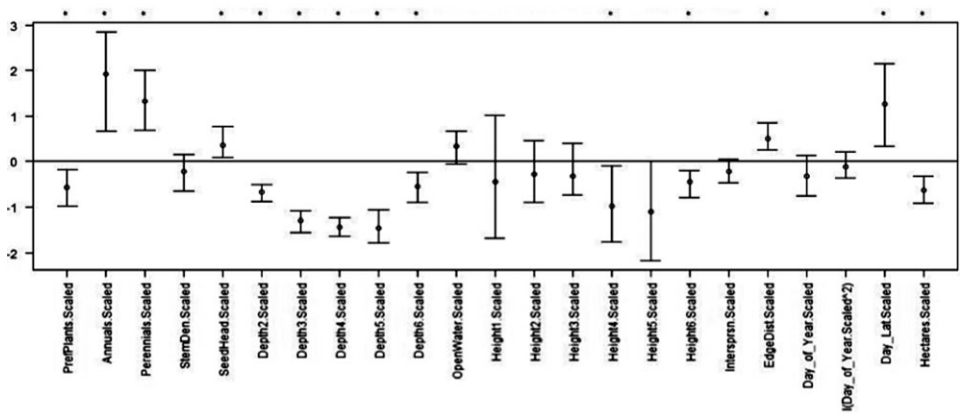

Figure S34. Single species example of posterior credible intervals (CI) for individual parameters included in the model (Northern Shoveler, during autumn migration in the Mississippi flyway, global model). Asterisks denote parameters with CI that do not overlap 0, indicating significance.