Animal Diversity & Ecological Functions

WELCOME BACK!

Final Presentation: Bird's Diversity

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https://www.nistkasten-online.de/blog/unsere-gartenvoegel-die-amsel/

https://www.nabu.de/tiere-und-pflanzen/voegel/portraets/buchfink/

Research Question

*How do **bird species diversity**, **composition** and **abundance** differ between **urban parks** and **forests** in Göttingen?*

https://www.nabu.de/tiere-und-pflanzen/voegel/portraets/kleiber/

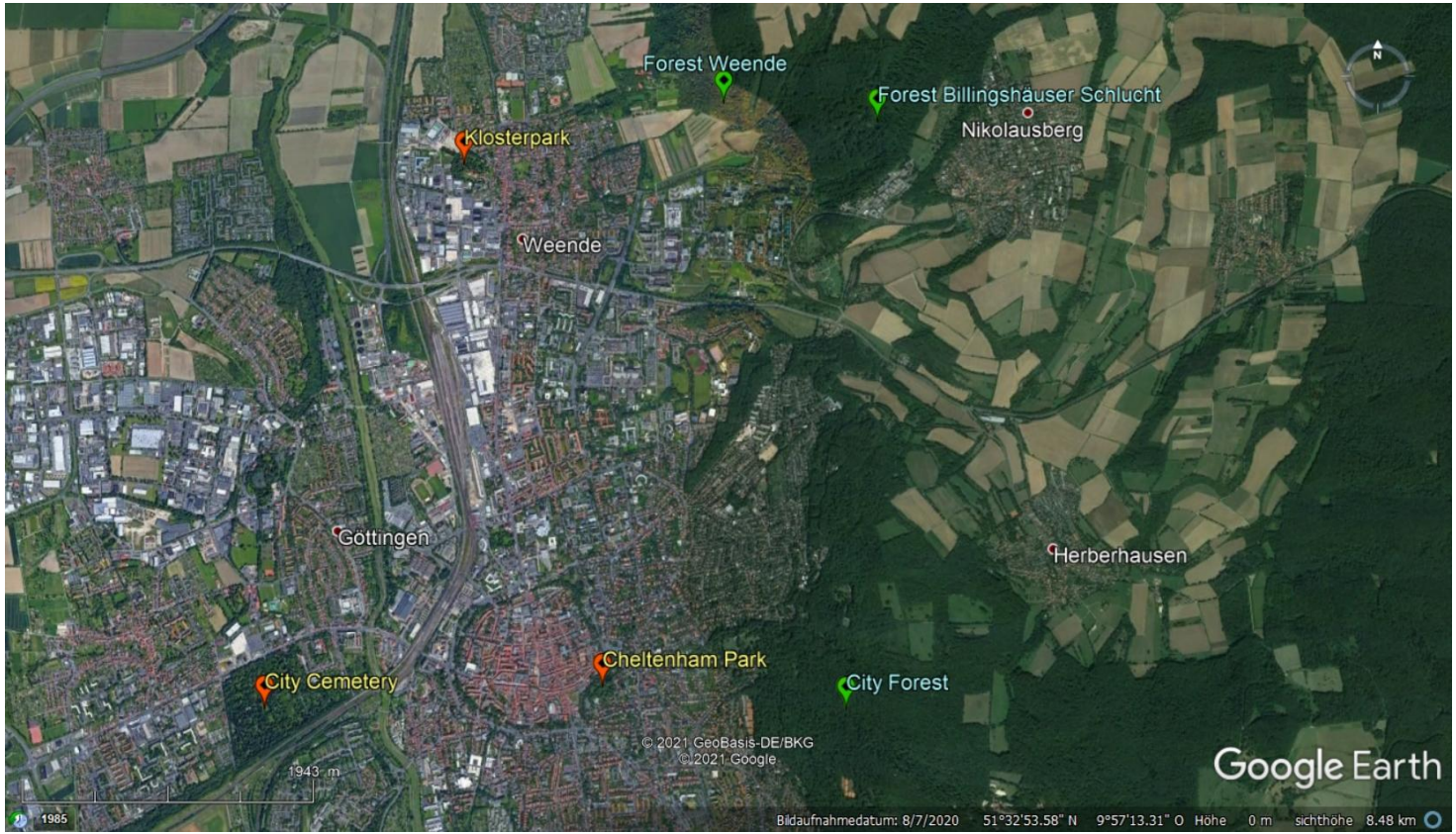
Survey Design and Recap

- 3 forest sites & 3 park sites (randomly selected in predefined areas)
- per site 3 replicates (with 100 m distance)
- at each replicate 10 min of listening/observing to record bird species
- site characterization:
  - tree diversity (species & dbh distribution)
  - microhabitat diversity

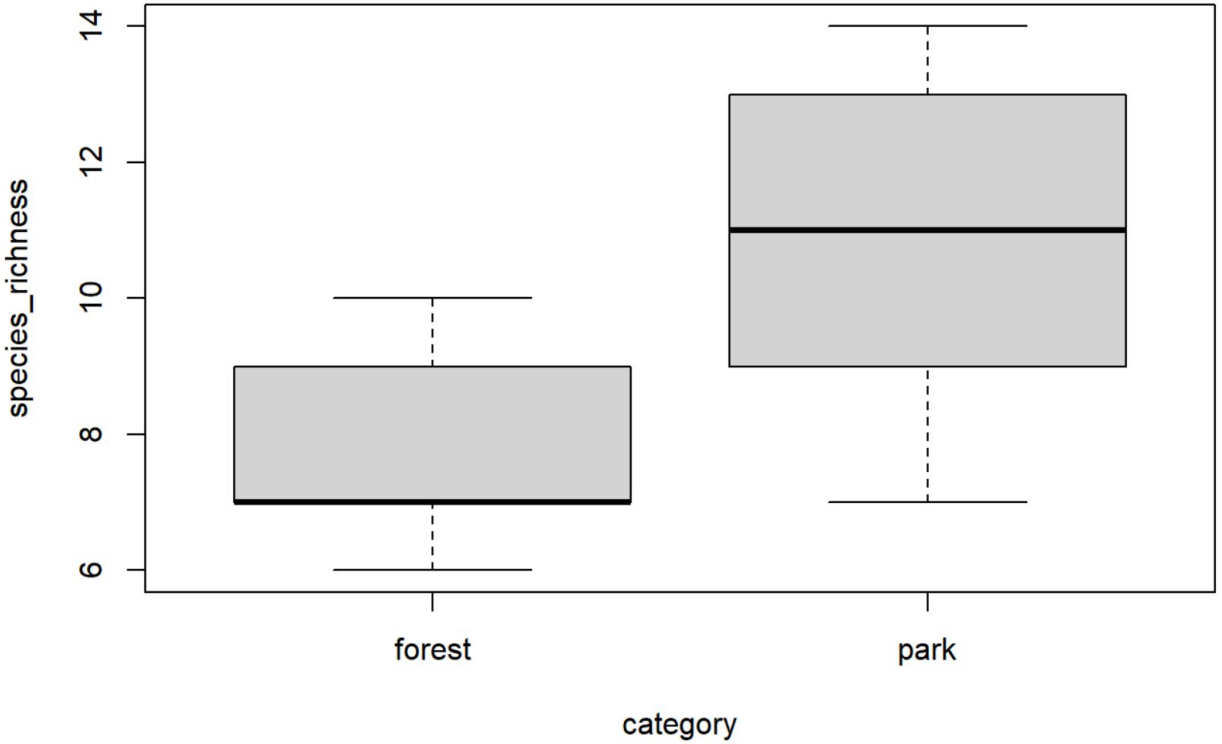
  } transect of 50 m length
  - tree canopy cover & ground vegetation type
  - size of park/forest
- time frame from 6 am to 9 am
- weather conditions/temperature + replicate coordinates

https://www.nistkasten-online.de/blog/wp-content/uploads/2019/08/AdobeStock_237243898-1.jpeg

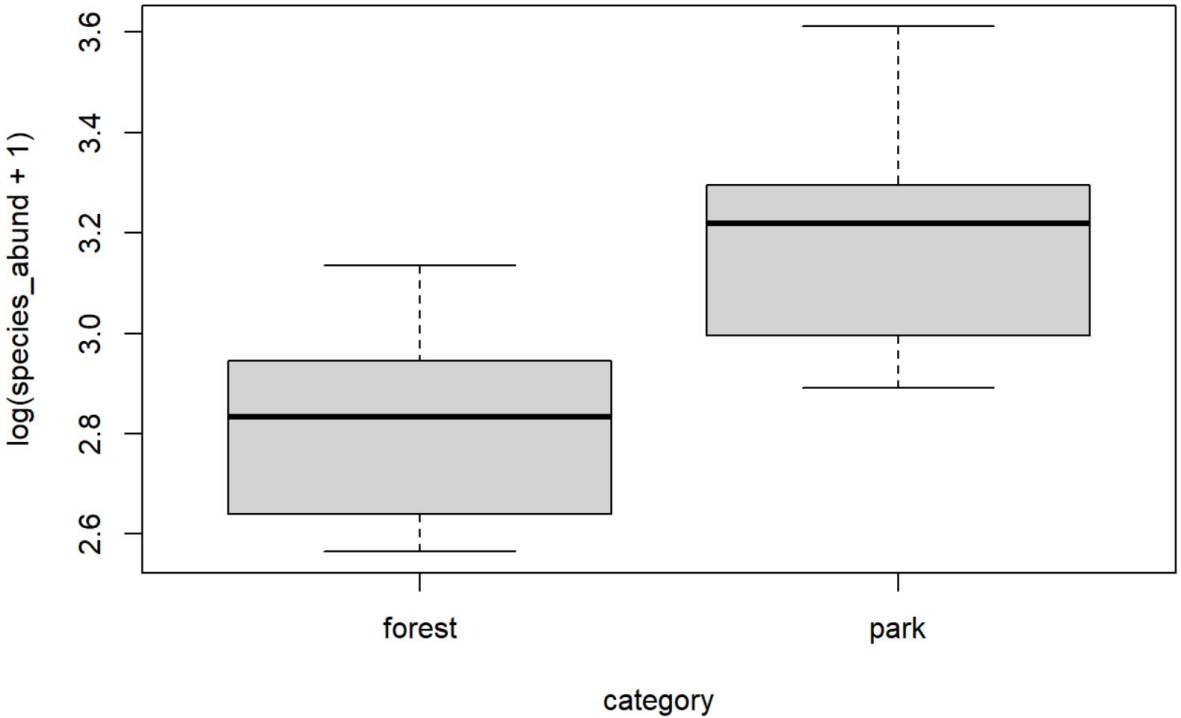
Survey Sites and Recap



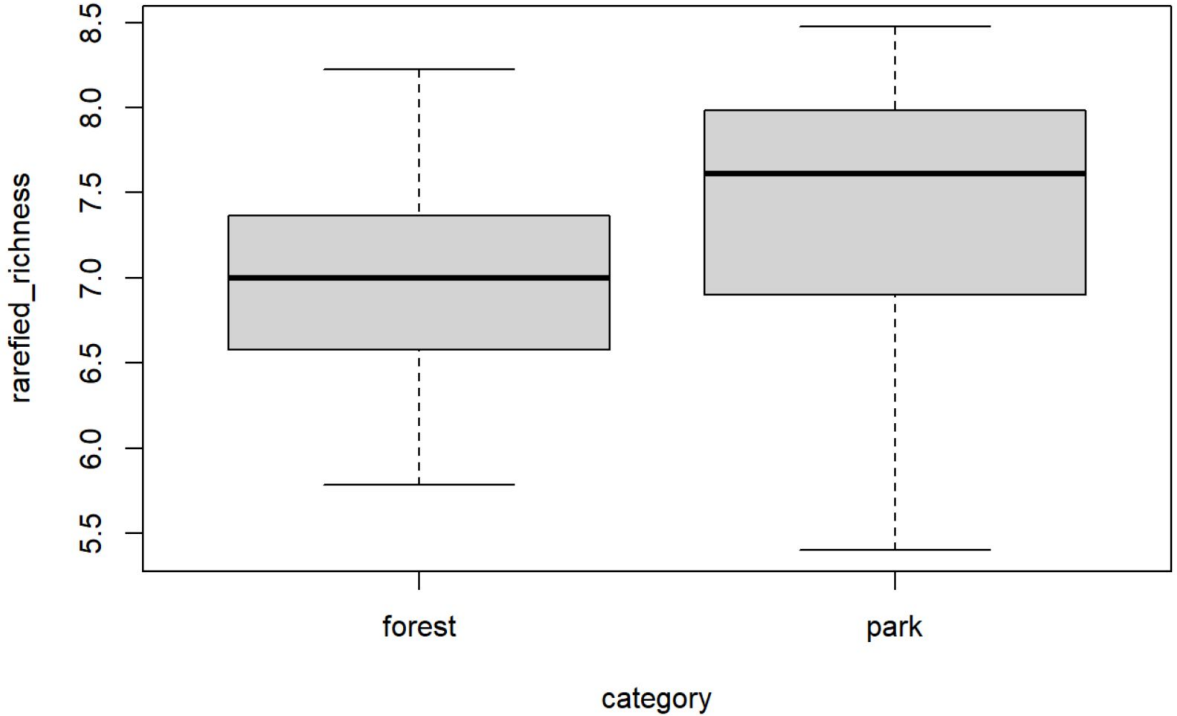
Results - Bird Species Richness



Results - Bird Species Abundance



Results - Bird Species Rarefied Richness



Results - Linear Mixed Effects Model

Doing a model for each of our values measured: species richness, species abundance and rarefied richness

Analysis of the models and how the variables are influencing in our analysis

Information criterion approach (AIC) as a reference value

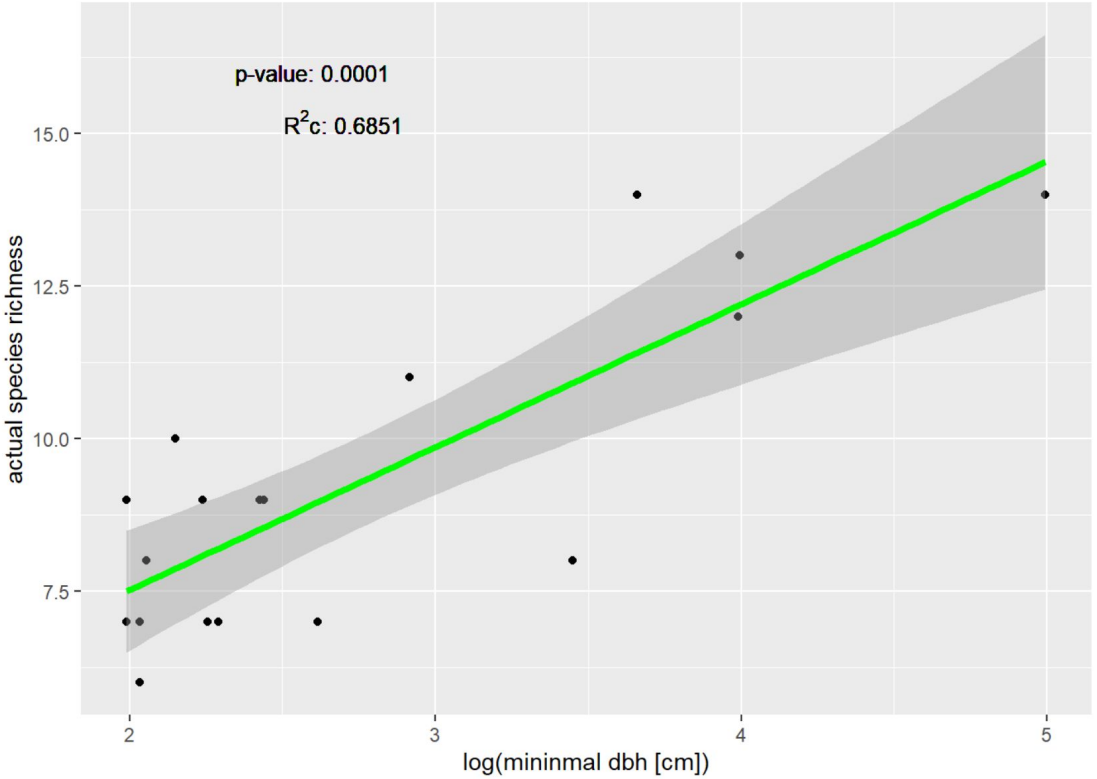
Removing variables that were not still influencing with a significant value

Results - Linear Mixed Effects Model

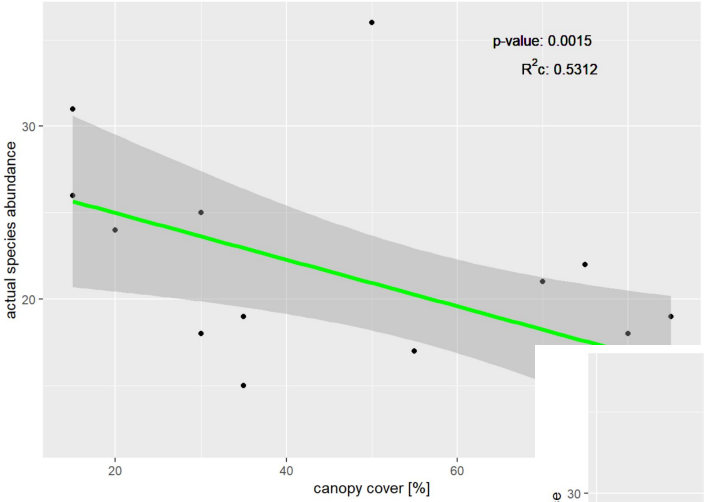
	Category	*Size*	*Canopy Cover*	*Nº tree species*	*Nº tree individuals*	*log(dbh min)*	*Nº microhabitats*	*Temperature*
Model 1. Species Richness	Dismissed	Dismissed	Dismissed	Dismissed	Dismissed	Highly significant	Dismissed	Dismissed
Model 2. Species abundance	Dismissed	Dismissed	Highly significant	Dismissed	Dismissed	Highly significant	Highly significant	Dismissed
Model 3. Rarefied Richness	Dismissed	Dismissed	Dismissed	Dismissed	Dismissed	Highly significant	Dismissed	Dismissed

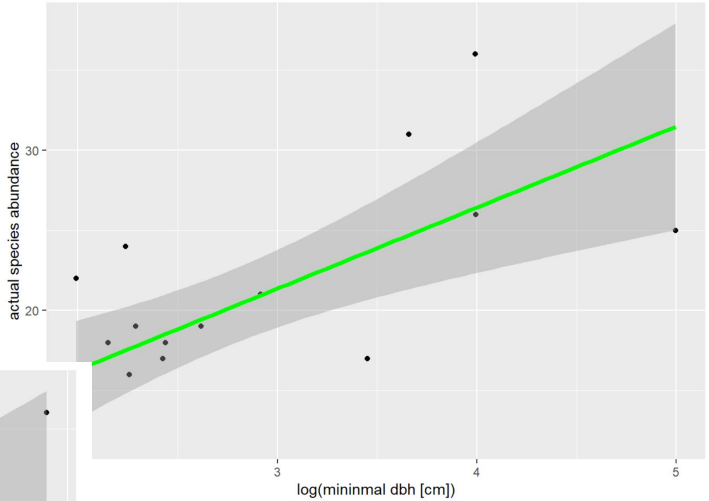
selected as variable of the best model fit, discarding non-significant variables

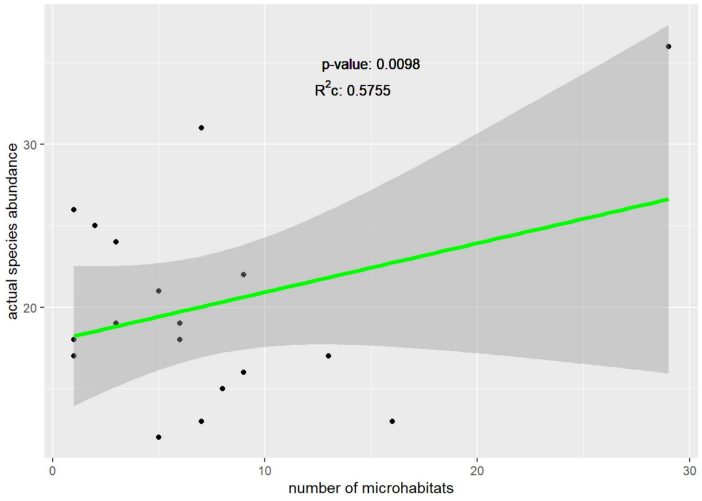
Results - Species Richness



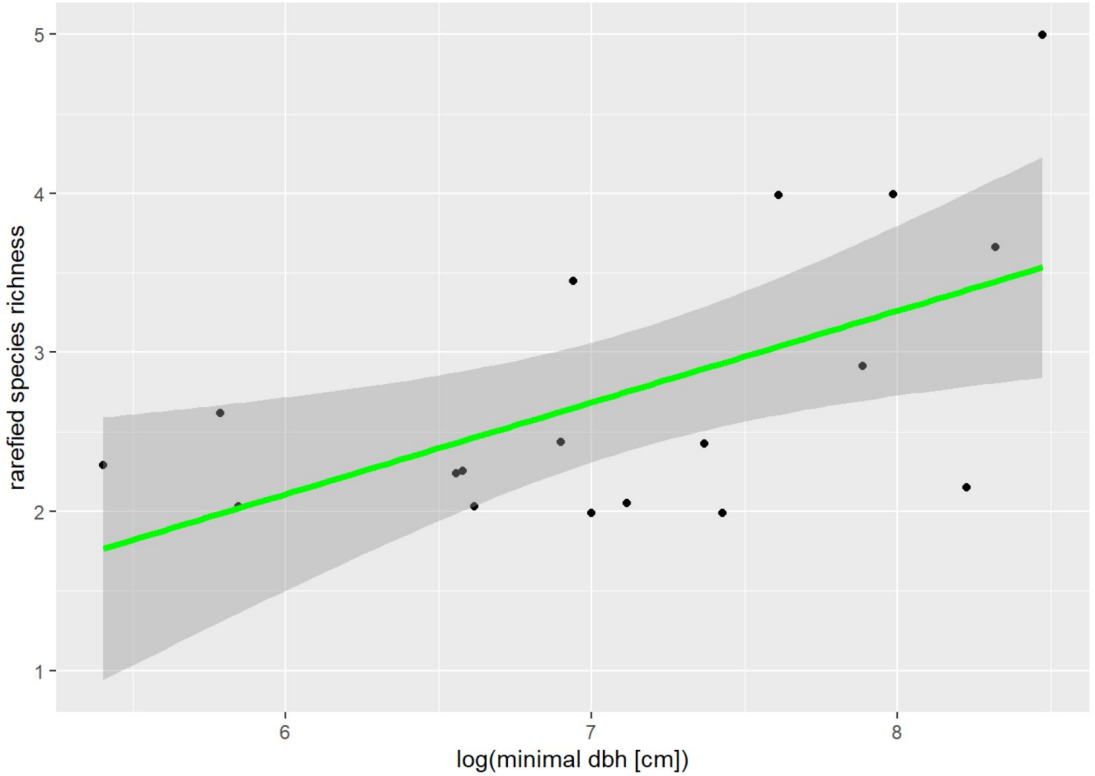
Results - Species abundance



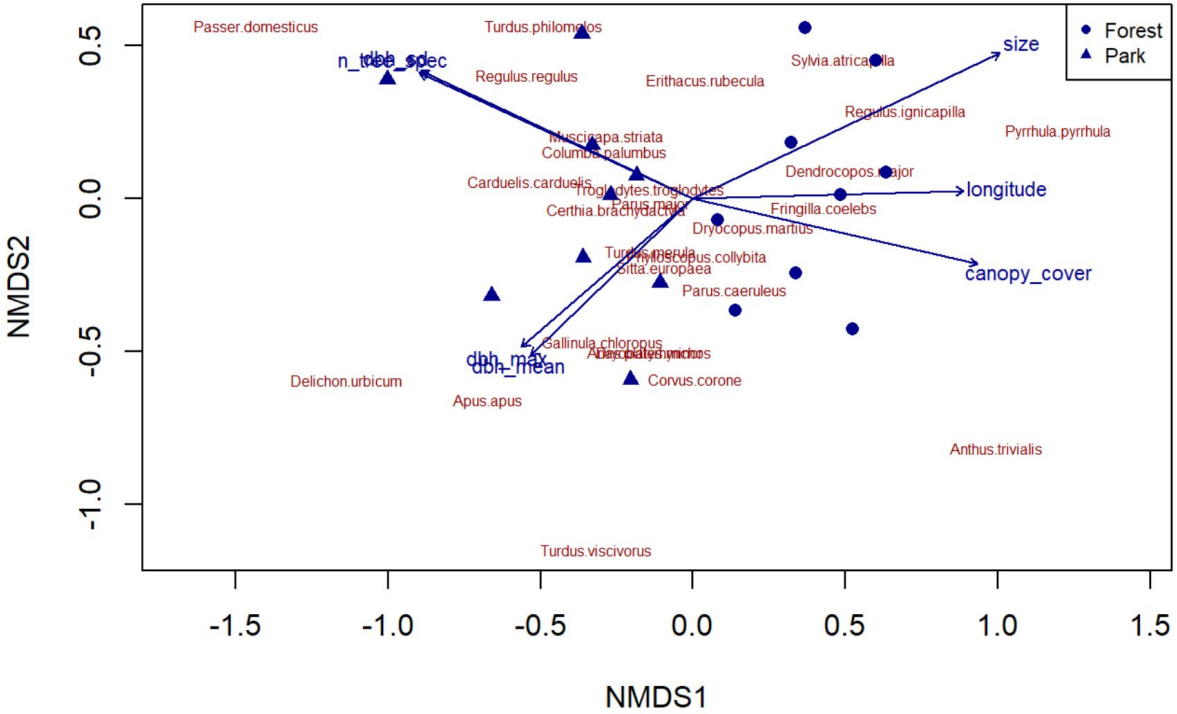




Results - Rarefied Richness



Results - Linear Mixed Effects Model



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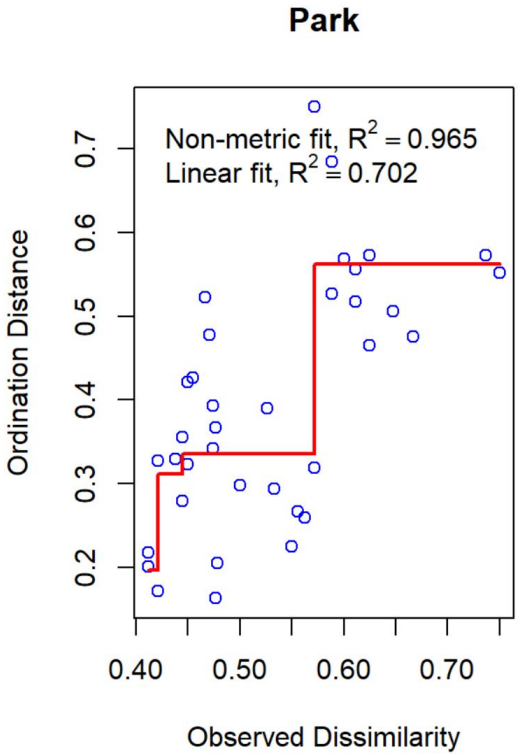

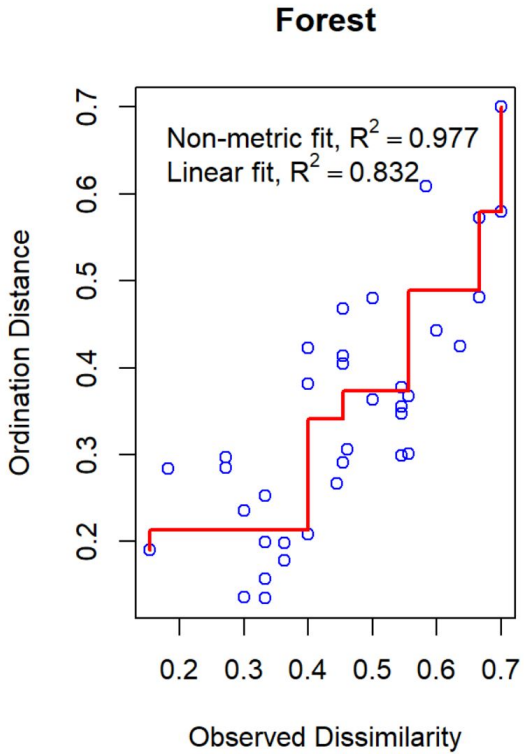

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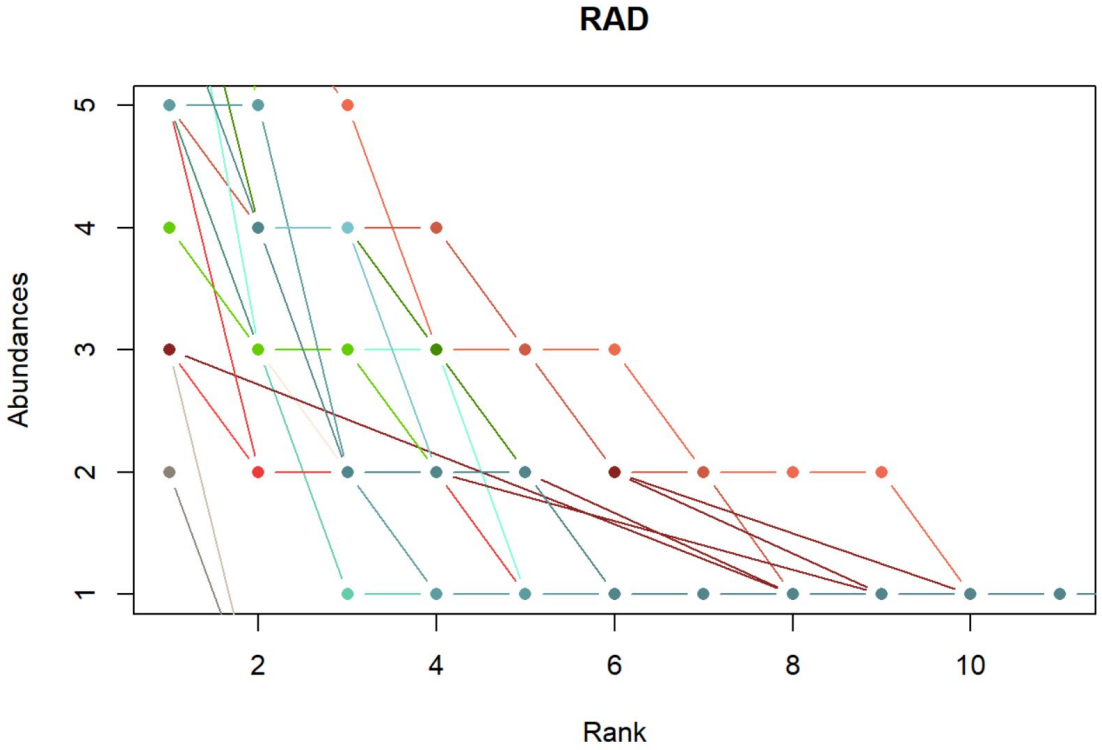

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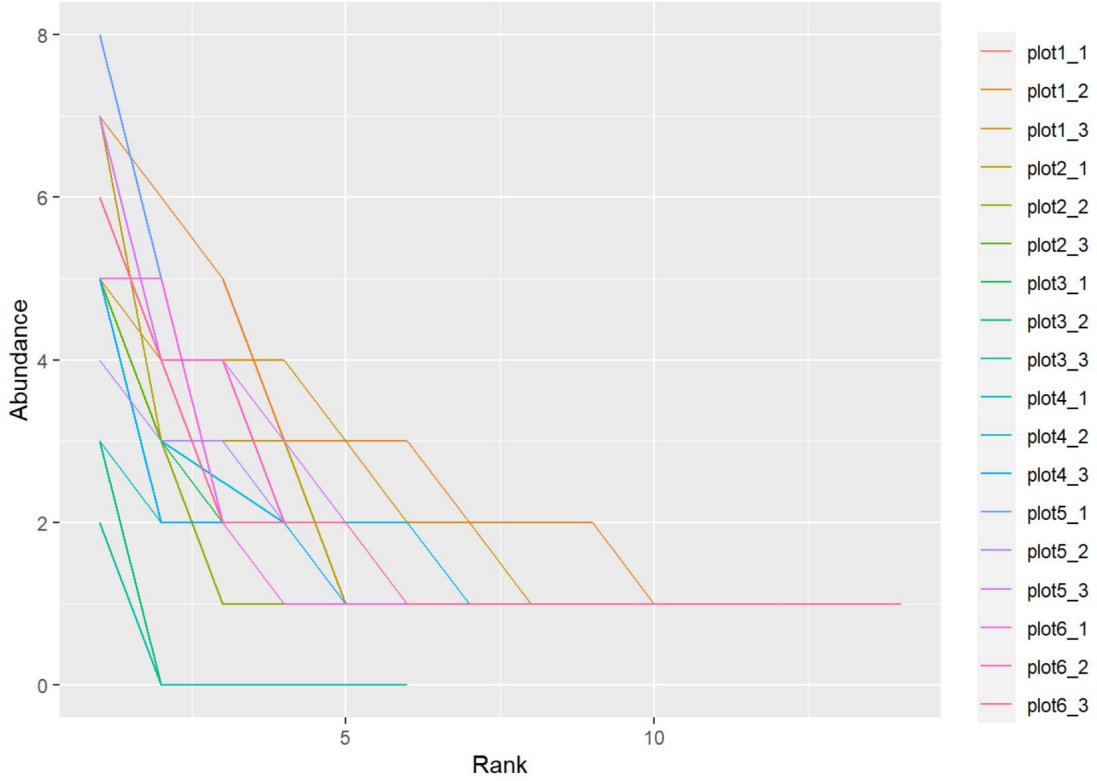

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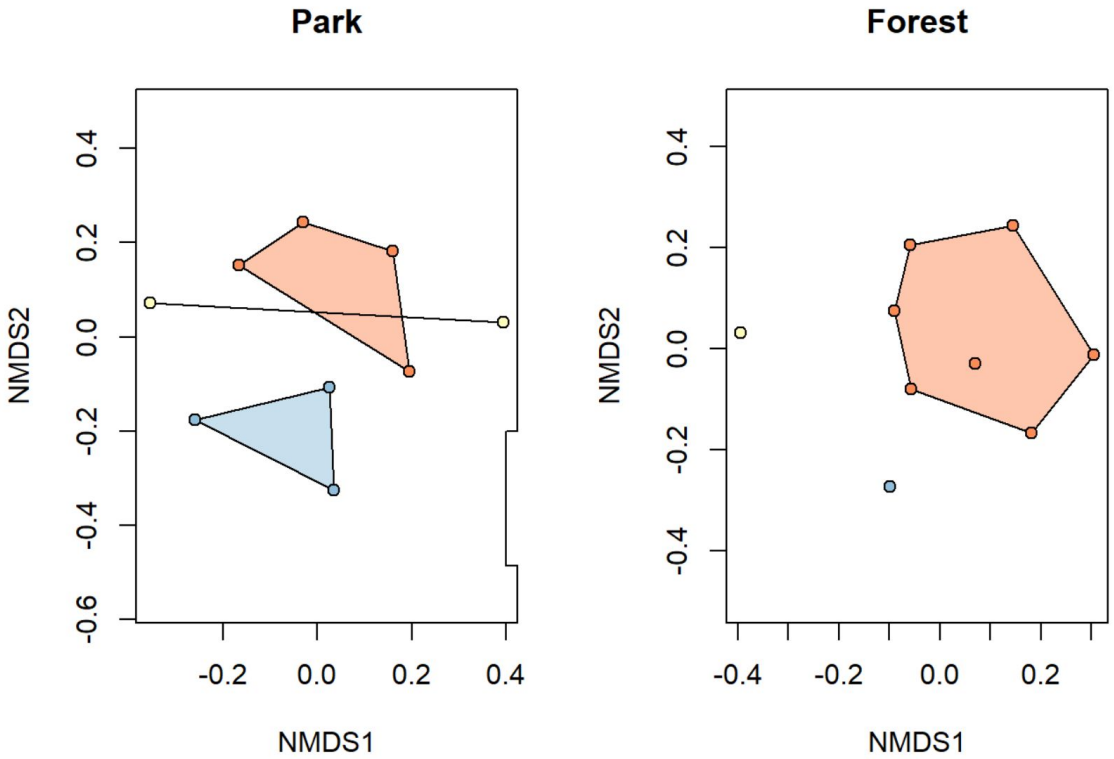

Some conclusions

- Park is richer in microhabitats & tree species than forests
- The average of birds diversity is higher in parks than in forests
- ...

https://vogeltrainer.nabu.de/vogel/ringeltaube/

Potential Error Sources

systematic errors:

- starting as amateurs regarding bird observation
- limited precision of app
- double-counts from listening & observing or from 3 observers involved

→ over-/underestimation of bird abundance and diversity

random errors:

- minimal number of replicates (3)

→ representative for site?

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