

Evaluating the Effects of Exclosures on Spring Ephemerals in Cincinnati Parks



Evan Bold*, Jordan Gerda*, Hannah Lynam, Lillie Braun, Brittany Powers-Luhn, Noah Bruce, Rhalena Seballos, Jacob Lawrence, & Stephen F. Matter
Department of Biological Sciences, University of Cincinnati

Introduction

An overabundance of herbivorous white-tailed deer (*Odocoileus virginianus*) may have a negative effect on the abundance of native spring ephemerals in urban southwestern Ohio (Christopher et al. 2014). Cincinnati Parks built exclosures, two in California Woods and one in Alms Park, paired with control plots of the same size in order to evaluate the effects that meso herbivores have on the local flora. Our study seeks to examine the effects that herbivory has on spring ephemerals. We sampled ephemerals from each of the exclosures and compared them to samples from the matching control plots to estimate the effects that herbivores have on ephemerals. We hypothesize that spring ephemeral diversity and abundance will be greater in treatment than control plots due to greater herbivory in the control plots. We will continue to collect data throughout the season to assess additional effects on plants with later phenologies.

Methods

The exclosures were recently constructed in both Cincinnati Parks. To evaluate the effects of these exclosures (Fig. 1 and 2) on spring ephemerals (Fig. 3), we counted the total number of individual plants of each species inside the exclosure and in a paired area of equal size adjacent to the exclosure. For ground cover where each individual plant could not be counted, the cover percentage of the exclosure was recorded. Sampling took place in mid-April 2021.

The data was analyzed using a paired T-test for both the effects of the exclosures on plant species richness and on total plant abundance.

Results

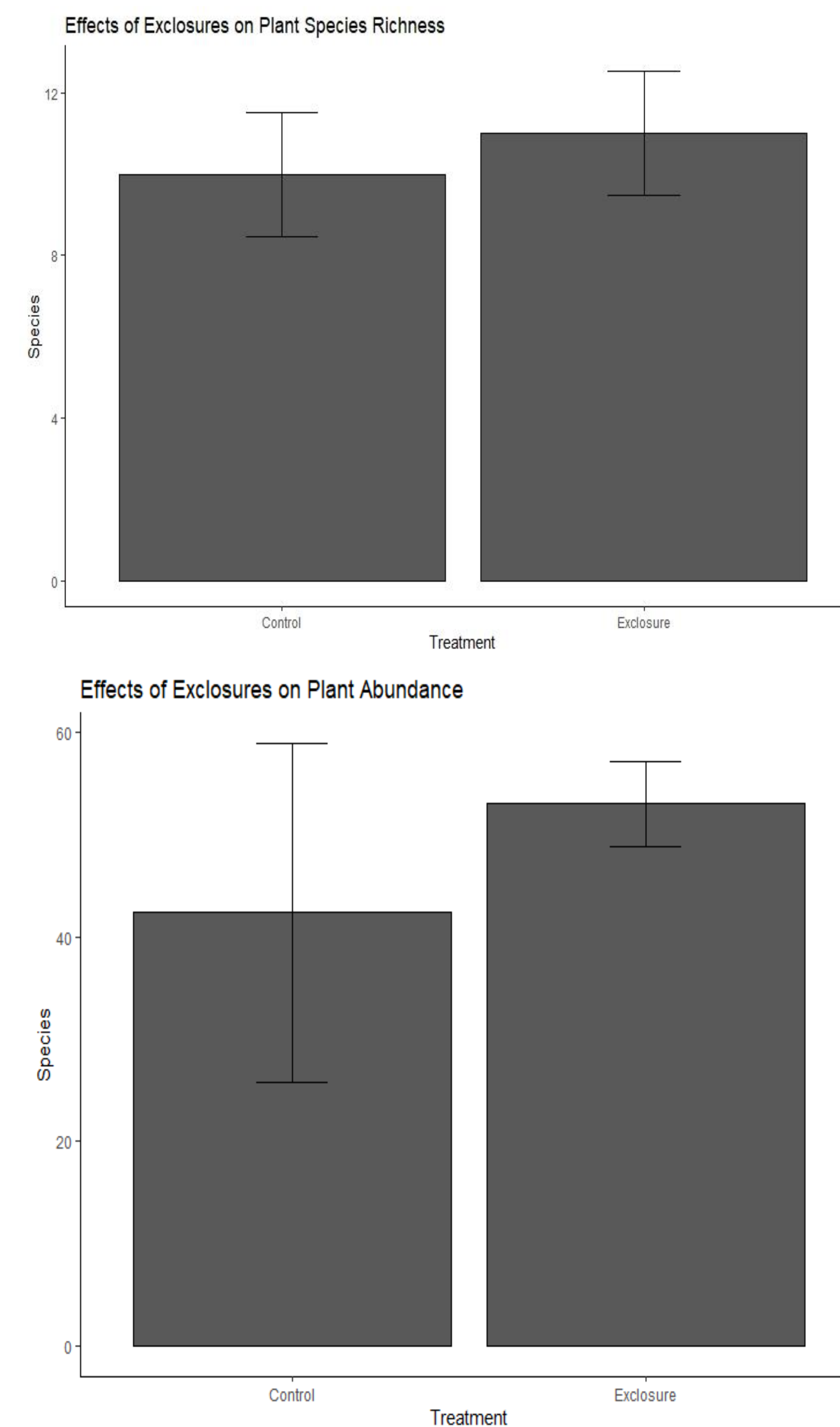


Figure 5: Mean plant species richness in controlled and exclosure conditions (top) and mean plant abundance in controlled and exclosure conditions (bottom).

The mean number of plant species recorded in the control plot (10 species) was not significantly different compared to the number of plant species recorded in the exclosures (11 species; $t = 1.73$, $df = 2$, $p = 0.22$).

The mean individual plant abundance recorded in the control plots (approx. 42 plants) was not significantly different than plant abundance recorded in the exclosures (53 plants; $t = 0.72$, $df = 2$, $p = 0.55$).



Figure 1. Exclosure in California Woods where data was collected.

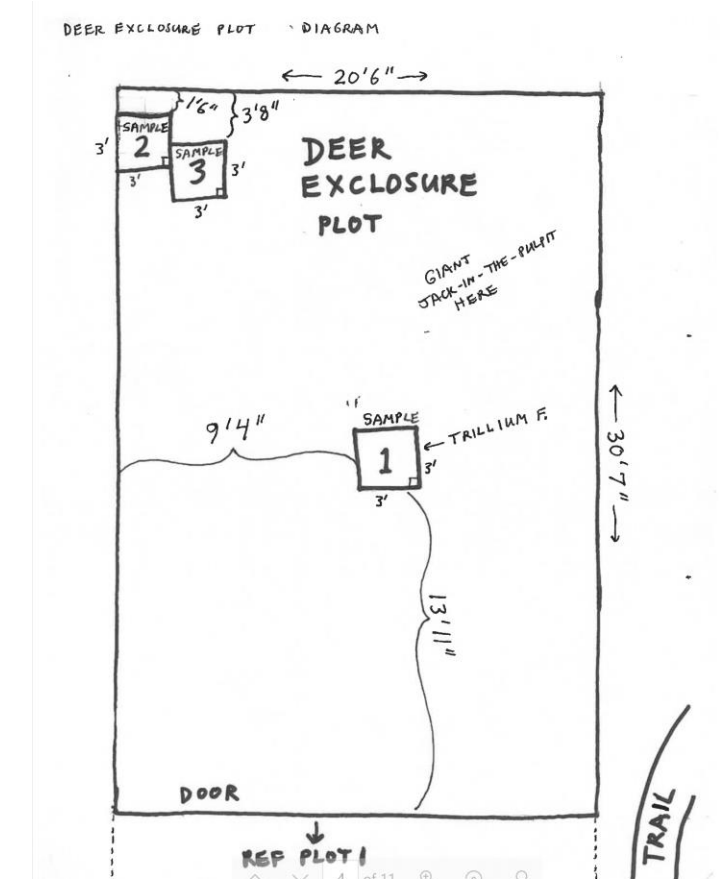


Figure 2. Exclosure example drawing.



Figure 3. Spring ephemeral (Drooping Trillium).



Figure 4. Deer caught on camera near a California Woods exclosure.

Conclusions

- We found no evidence that deer and meso mammal herbivory affects the plant species richness or plant abundance of the spring ephemeral community.

References

Christopher, C., G. Cameron, & S. Matter. (2014). Individual and interactive effects of Amur honeysuckle (*Lonicera maackii*) and white-tailed deer (*Odocoileus virginianus*) on herbs in a deciduous forest in the eastern United States. *Biological Invasions*. (16)11.

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