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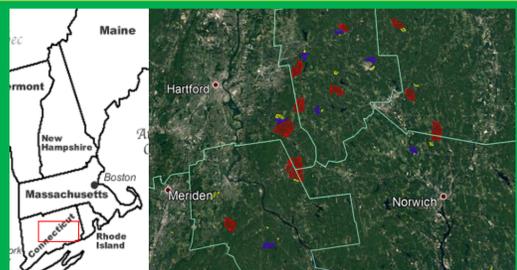
How Forest Fragmentation Effects Bird Predation on Caterpillars

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Introduction

Forest Fragmentation is when human infrastructure splits large forests into multiple smaller forest fragments. This can have a significant effect on the plant, herbivore, and carnivore communities present in the ecosystem and on the interactions between them (tri-trophic interactions). My project specifically looked at the effects forest fragmentation has on bird predation of herbivorous caterpillars, and analyzed the differences in predation between dietary generalist and specialist caterpillar species. Based on previous years of work in the Singer lab I hypothesized that the effect of bird predation on dietary generalists would be greater than that on dietary specialists. A second hypothesis based on the previous findings is increased intensity of bird predation in larger forest fragments.



Methods

- To test the effects of bird predation we set up a predator exclusion experiment on understory witch hazel and red maple saplings in 16 forest fragments of varying sizes throughout Central and Eastern Connecticut.
- Using four different treatments and four branches per replicate we set up 3 replicates of both host plant species per site.
- The treatments for bird exclusion used bird netting around the leaves of the sapling
- We sampled the branches twice (3 weeks after setup and again 2 weeks after the first round) and compared the caterpillar communities found on experimental branches to those found on control branches.

Effects of Bird Predation on Generalist and Specialist Caterpillar Counts

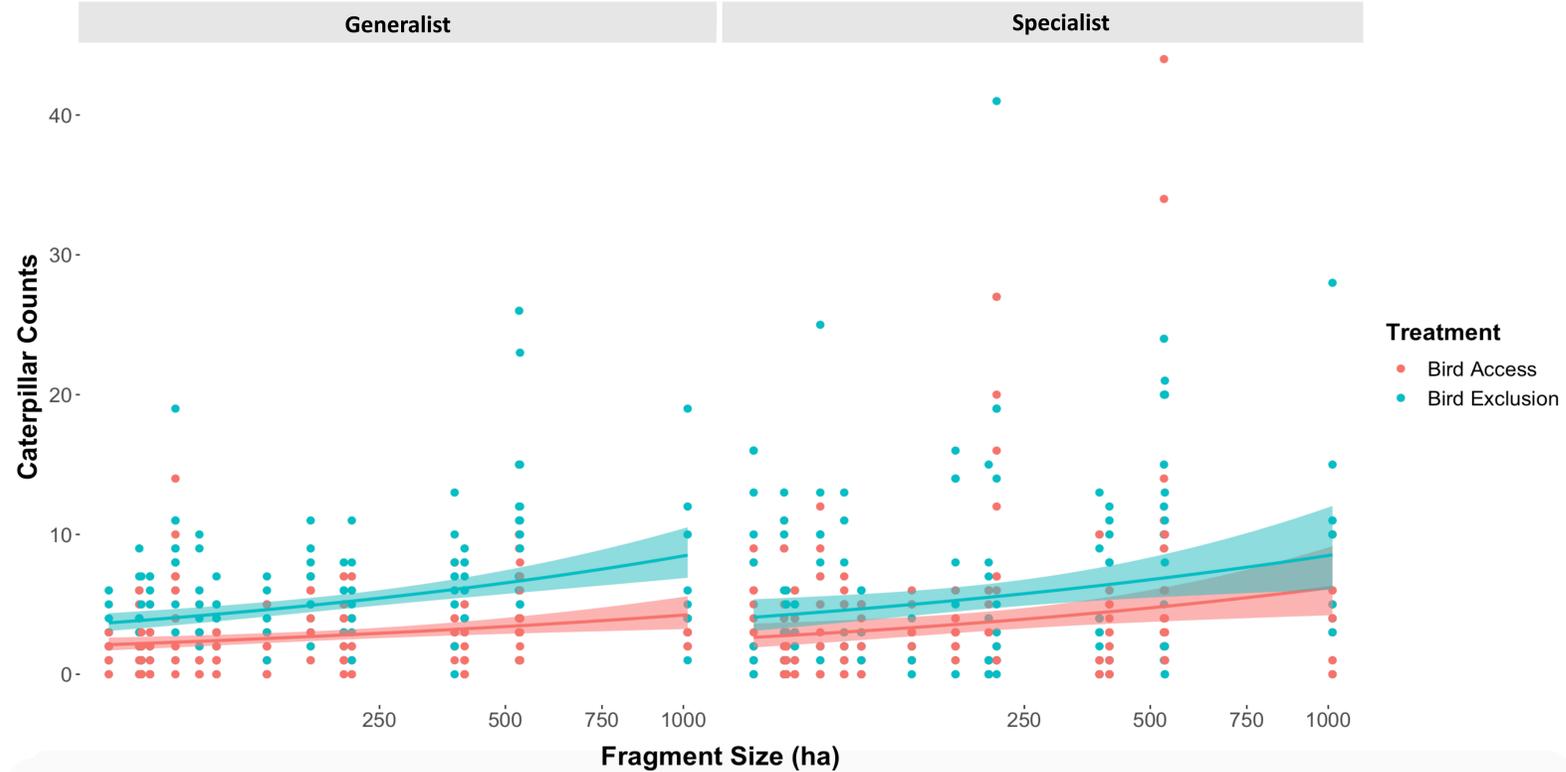


Figure 1. Bird exclusion significantly increased abundance of dietary generalist caterpillars ($\beta = 0.61, P < 0.0001$) and dietary specialist caterpillars ($\beta = 0.28, P < 0.0001$). The number of caterpillars significantly increased with fragment size ($\beta = 0.19, P = 0.022$) for both diet breadths.

Conclusions

- Excluding birds significantly increased the abundance of caterpillars from both diet breadths.
- Caterpillar abundance of both diet breadths increased significantly as fragment size increased.
- As I hypothesized the effect of bird exclusion was greater on dietary generalists ($\beta = 0.61$) than specialists ($\beta = 0.28$), ($P = 0.004$).
- Fragment size did effect the strength of bird predation on caterpillars.



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