

The Effect of Forest Management on Moth Diversity in the Missouri Ozark Forest

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Introduction

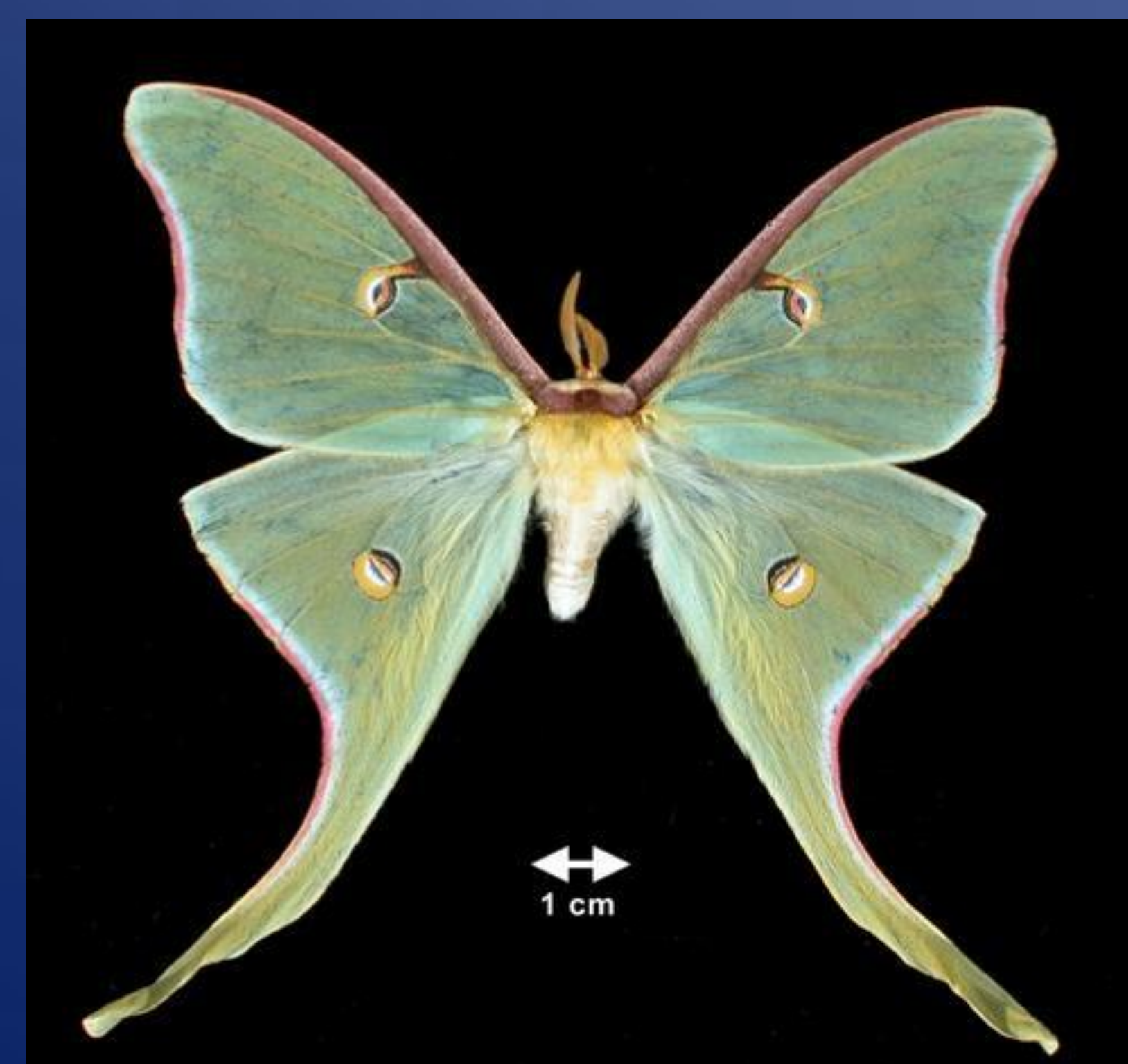
- One of the most pressing research questions facing forest ecology today is whether logging significantly changes biodiversity (Ehrlich 1996).
- Forest inhabiting insects are greatly affected by forest disturbance but have received little attention among conservation biologists (Varkonyi et al. 2009).
- I examined and compared species richness, evenness and abundance of specimens collected in sites of no harvest and even age management.



Specimens collected at Cardareva Even age

Methods

- Moths sampled within the Current River Conservation Area were collected at two sites that had undergone two different timber harvest management techniques.
- The two sites sampled from had either (a) experienced no harvest or (b) undergone timber harvest in 1996.
- Moths were collected using a 12-watt black light and sacrificed in jars containing ethyl acetate.
- The two sites were sampled for three nights each for a total of two hours per night.



Actias luna



Eaclesimperialis

	Evenage	Control
Abundance	84.3 ± 12.72	72.3 ± 31.18
Richness	13.3 ± 2.40	10 ± 2.89
Evenness	51.04 ± .35	37.93 ± 28.10
S-W Index	3.87 ± 1.39	2.26 ± 1.94
% Uniqueness	26%	38%
# of Unique Species	6	9

Table 1a. Average values for various measures of diversity of moths in the Missouri Ozark Forest

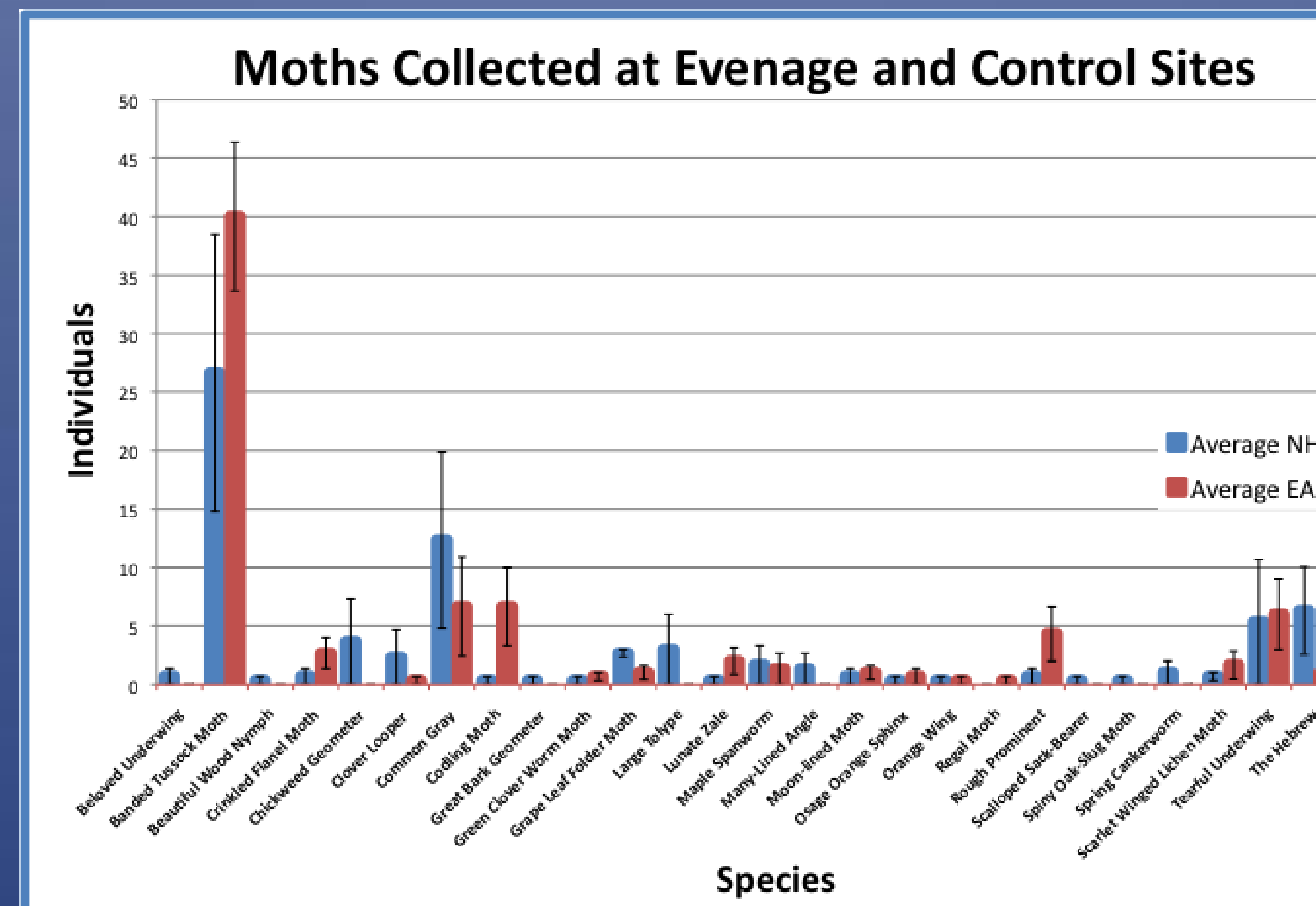


Fig. 1 Average species present among even age and control sites

Results

- A total of 426 individuals and 36 different species were sampled from harvest and no harvest sites.
- One-way ANOVA tests on species abundance ($P=0.74$), richness ($P=0.42$), evenness ($P=0.60$) and S-W index ($P=0.40$) revealed no significant difference between diversity of Lepidoptera on even age and no harvest management sites (table 1).
- There were 6 unique species (26% uniqueness) on the even age site and 9 unique species (38% uniqueness) on the control site (table 1)
- Figure 1 shows average species abundance between the two managed sites

Discussion

Results showed no significant difference between diversity of Lepidoptera species on sites of no harvest and even age management. Although statistical analysis of data showed no difference between Lepidoptera diversity within harvested and no harvested sites, there is still reason to believe that there is some difference. During the course of this study, I took into consideration several confounding variables that may or may not have changed the final results. Variables included total sampling hours, ambient moonlight during sampling and timing of sampling during the two months. Due to the fact that I was only able to sample each site for a total of six hours, overall diversity may not have been well represented and therefore left room for significant error. Keeping in mind that moths have a roaming range of at most 1 km, there was no concern with species overlap. It is still possible, however, that species collected at one site were present at the other but not yet collected. In the future, I hope that more thorough studies will be done on Lepidoptera within the Missouri Ozark Forest.



Citations & Acknowledgements

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Varkonyi G., Huussaari, M., Lappalainen, H. 2003 Use of Forest Corridors by Boreal Xestia Moths. *International Association for Ecology Oecologia*, Vol. 137, No.3 (Nov., 2003), pp.466-474

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