Session A, 2015 Third Place: The Effects of Canopy Gaps on Percent Cover And Species Richness of Vascular Understory Vegetation In Northern Hardwood Forests

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The Effects of Canopy Gaps on Percent Cover and Species Richness of Vascular Herbaceous Vegetation In Even-Age Stands

Nicholas Dietschler, Sienna McDonald, Emmett Daly
Introduction

- Observations:
  - Tree mortality leads to increased light
  - Herbaceous layer composition

- Species richness higher in forest gaps (Anderson & Leopold, 2002) (Goldblum, 1997)

- Herbaceous layer % cover higher in forest gaps (Moore & Vankat, 1986)
Hypothesis

$H_a$: In even-age forest gaps the herbaceous layer species richness and percent ground cover will be greater than in areas with full canopy.

$H_o$: In even-age forest gaps the herbaceous layer species richness and percent ground cover will show no significant difference to areas with full canopy.
(Baudry, Charmetant, Ponette, & Collet, 2014)
Sampling Methodology

10 m

Line Intercept

Timed Meander
Average Canopy Cover of Gaps vs. Closed Canopy Areas

T-Value: -7.64
P-Value: < 0.001
N=12
Average Herbaceous Cover in Gaps vs. Closed Canopy Areas

<table>
<thead>
<tr>
<th>Plot Type</th>
<th>% Herbaceous Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gap</td>
<td>60.00</td>
</tr>
<tr>
<td>Closed Canopy</td>
<td>30.00</td>
</tr>
</tbody>
</table>

T-Value: 5.82
P-Value: <0.001
N=12
Species Accumulation Curves in Gaps

Species Accumulation Curves in Closed Canopy Areas
Average Herbaceous Species Richness In Forest Gaps vs. Closed Canopy Areas

T-Value: 2.58
P-Value: 0.030
n=12
Discussion

• Gaps and closed canopy sites show a significant difference in herbaceous % cover and species richness
  – Plausible reasons why
  – Implications

• Improvements:
  – Measurement of further factors
  – Long term study
  – Focused habitat type
Future Studies

• Comparison of even-age stands to old-growth
• Differences in species composition between gaps and closed canopies
• Regeneration Niches

<table>
<thead>
<tr>
<th>Species</th>
<th>% Cover Gap</th>
<th>% Cover Canopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Maple</td>
<td>3.12</td>
<td>0.48</td>
</tr>
<tr>
<td>Sugar Maple</td>
<td>0.36</td>
<td>0.03</td>
</tr>
<tr>
<td>American Beech</td>
<td>4.35</td>
<td>3.98</td>
</tr>
<tr>
<td>Yellow Birch</td>
<td>0.53</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Table 1: Percent cover of four common trees in gaps compared to canopy sample sites
Conclusion

• Higher % herbaceous cover and species richness in forest gaps

• Varied species composition
Acknowledgements & References

- SUNY ESF
- CLBS Staff


Questions!?