Understory Vegetation Composition and Biomass on the Tree Islands in the LILA Experimental Site

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Overstory – understory relationship

- **Stand Density**
- **Overstory Cover**
- **Forest Development**
- **Understory characters** – composition, cover, and biomass
Schematic representation of LILA Site

Substrate types:
- L = Limestone
- P = Peat

Year of tree plantation (Stand age)
- 2006
- 2007

Dimensions:
- 49 X 14 X .6 m
Methodology

M1-W Elevation Map with Tree Locations and Understory Plots

Legend
- Tree species
  - AG
  - AR
  - BS
  - CI
  - FA
  - IC
  - MC
  - PP

Elevation (m)
- 4.20 - 4.25
- 4.25 - 4.30
- 4.30 - 4.35
- 4.35 - 4.40
- 4.40 - 4.45
- 4.45 - 4.50
- 4.50 - 4.55
- 4.55 - 4.60
- 4.60 - 4.65
- 4.65 - 4.70
- 4.70 - 4.75
- 4.75 - 4.80
- 4.80 - 4.85
- 4.85 - 4.90
- 4.90 - 4.95
- 4.95 - 5.00
- 5.00 - 5.05

Understory vegetation plots
Methodology

Hydrology
- Relative elevation

Overstory
- Canopy openness
- Leaf Area Index (LAI)
NMDS ordination of understory vegetation plots
Effect of canopy cover on understory vegetation composition depends on stand age
NMDS ordination of understory vegetation plots for 2006 and 2007 plantations (Sites by substrate types)

ANOSIM
R=0.148. p=0.003

Strength of effects of substrate types weakens with stand age.
<table>
<thead>
<tr>
<th>Substrate Type</th>
<th>Limestone</th>
<th>Peat</th>
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</thead>
<tbody>
<tr>
<td><strong>Andropogon virginicus</strong></td>
<td><em>(Broomsedge Bluestem)</em></td>
<td><strong>Kosteletzkya virginica</strong></td>
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<td></td>
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<td><em>(Virgina saltmarsh mallow)</em></td>
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<tr>
<td><strong>Bidens alba</strong></td>
<td><em>(Beggartrics)</em></td>
<td><strong>Boehmeria cylindrica</strong></td>
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<td></td>
<td><em>(Beggartrics)</em></td>
<td><em>(False nettle)</em></td>
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<td><strong>Panicum repens</strong></td>
<td><em>(Torpedograss)</em></td>
<td><strong>Baccharis glomeruliflora</strong></td>
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<td></td>
<td><em>(Silvering)</em></td>
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<tr>
<td><strong>Ludwigia microcarpa</strong></td>
<td><em>(Small fruit Primerose willow )</em></td>
<td><strong>Chrysobalanus icaco</strong></td>
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<td></td>
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<td><em>(Cocoplum)</em></td>
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<tr>
<td><strong>Ambrosia artemisifolia</strong></td>
<td><em>(Common ragweed)</em></td>
<td><strong>Melothria pendula</strong></td>
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<td><em>(Creeping cucumber)</em></td>
</tr>
</tbody>
</table>
Understory biomass within different tree plantation spacing

![Graph showing the relationship between biomass and tree plantation spacing](image)

- **Mean**
- **Mean±SE**
- **Mean±0.95 CI**

**Graph Details:***
- Biomass (g m⁻²) on the y-axis.
- Tree plantation spacing (m) on the x-axis.
- Three different spacing levels: 1.00, 1.67, 2.33, and 3.00 m.
- The graph indicates a significant difference in biomass across different spacing levels.

**Statistical Tests:**
- *F₃,₁₈₈ = 3.39*
- *p = 0.019*
Relationship between Canopy cover & Understory biomass (by Stand ages)

Effect of canopy cover on understory biomass increases with stand age.
Understory biomass for both stand ages in both substrate types

2006

2007

Substrate type

L

P

Biomass (g m$^{-2}$)

Mean

Mean±SE

Mean±95% CI
Tree islands (ENP & WCA3B)

Still long way to go

Overstory Cover

Tree islands (LILA)

Understory biomass
Overstory – understory relationship
(LILA experimental sites)
Conclusions

- Differentiation in understory vegetation composition along hydrology gradient on LILA islands mimics the vegetation pattern on natural tree islands in the Everglades.

- Lower cover and biomass in high tree density than in more open stands suggests an increasing influence of planted trees on the availability of resources for understory vegetation.

- The strength of the effects of overstory vegetation on understory species composition and biomass increases with stand age.

- The strength of the effects of substrate type on understory composition also depends on stand age.
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