Responses of Long-Unburned Coastal Scrubby Flatwoods to Prescribed Burning
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Introduction

Although prescribed burning is an important management tool for ecosystem restoration in Cedar Key Scrub State Reserve (CKSSR), this is the first study that analyzed the effect of prescribed burning on scrubby flatwoods not burned since 1955.

In addition, this is the first research carried out on plant community responses to prescribed fire in coastal scrubby flatwoods on the west side of Florida.

The objective of this study was to document recovery modes and structural and compositional changes in the post-burn community of woody species.

Research Hypothesis

The structure of woody species in scrubby flatwoods in CKSSR changes between preburn level and 12 month postburn

Methods: Study Design

Sampling Regimen: 12-2003 / 08-2006
- Sampling in 2 control sites: preburn
- Sampling in 2 treatment sites: preburn, 3,6,9, & 12 month postburn
- Stratified random sampling of 50 points in each site by using a quadrat of 4 squared meters
- Vegetation variables: No. of individuals per species of trees, saplings, and seedlings

Critical Assumption
- Treatment and control sites were ecologically similar
- Cluster & Discriminant Analysis & F-ration test to assess the critical assumption

Statistical Analysis
- Detrended Correspondence Analysis (DCA) to visualize multivariate changes in densities over time
- Multi-response Permutation Procedure (MRPP) to test the research hypothesis

Results

Recovery Modes:
- Resprouting was the recovery mode after burning for 26 oak and ericaceous species. Sand pine recovered by seeds after 6 months.
- Almost all dominant species reached preburn values in one year.
- This fast recovery has been documented, but not in one year.

Changes of densities over time:
- A – Ordination of absolute densities indicated more structural changes during the first 3 months.
- B – Ordination of relativized densities showed more compositional changes during the first 3 months.
- There were more compositional than structural changes after 3 months.

Structural changes after prescribed burning:
- According to the MRPP, there were significant changes in absolute densities within treated sites between preburn and 12 month postburn.
- There were also significant changes in absolute densities between control sites and treatment sites at 12 months postburn.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Distance</th>
<th>Observed distance</th>
<th>Expected distance</th>
<th>Variance</th>
<th>Skewness</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Density</td>
<td>Euclidean</td>
<td>46.9029</td>
<td>50.8919</td>
<td>0.0159</td>
<td>-0.7659</td>
<td>31.657</td>
<td>&lt; 0.001</td>
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<td>Sorensen</td>
<td>0.7039</td>
<td>0.7569</td>
<td>0.0000</td>
<td>-0.4809</td>
<td>-35.975</td>
<td>&lt; 0.001</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

Resprouting was the main recovery mode and the majority of the species reached pre-burn values during a 12 month period.
- There were structural and compositional changes during the first 3 months, but there were more compositional changes after that.
- The structural changes during the first 12 months were significant.