The effects of leather-leaf (*Chamaedaphne calyculata*) and speckled alder (*Alnus rugosa*) on plant biodiversity on Cranberry Bog

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INTRODUCTION

Cranberry Bog spans 70 acres of wetland and is a small yet important section of the 1200-acre Greenwoods Conservancy in Burlington, NY. As all wetlands are precious ecosystems, Cranberry Bog is particularly important because it displays characteristics of both a bog and a fen. A bog and a fen are types of wetlands, but differ in that a fen has an inflow of water other than from precipitation. Because of that difference, fens tend to have a higher pH, support a more diverse plant community and lack *Sphagnum* moss. There is a responsibility to preserve the bog/fen environment for education, beauty and rarity of the balanced system that currently prevails.

Leather-leaf (*Chamaedaphne calyculata*) and speckled alder (*Alnus rugosa*), plants native to Cranberry Bog, have formed dense thickets on *Sphagnum* mats as a natural step in ecological secession. (The presence of *Sphagnum* moss indicates that the ecological area contains mainly bog-like characteristics.) Leather-leaf shades small plants living on the mats, which I believe challenges diversity of the delicate environmental balance of plants in Cranberry Bog. The project that was started on Cranberry Bog this year followed the protocol of other management routines on fens around the world. Although the regimes focused on controlling sedges and reeds and not leather-leaf, they still began with species identification and percent cover measurement and continued with haying, grazing, cutting or burning (Suffolk Wildlife Trust, 1999; Nebraska Partners for Fish and Wildlife, 1999; The National Trust, 1999).

To test the hypothesis that leather-leaf and speckled alder inhibit diversity, all vascular plant species were identified on nine leather-leaf plots. An experimental leather-leaf and speckled alder cutting regime was then initiated on the plots. The species identifications conducted by future researchers can be compared to the data found this year and basic conclusions can be drawn.

METHODS

We measured and labeled three-2x2 meter plots in triplicate and roped off the areas. The plots were chosen so that leather-leaf occupied about the same percentage in the plots of a given cutting regime. As the results show, leather-leaf covered a mid-point

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of 62.5 percent in trial 1, 85 percent in trial 2, and 97.5 percent in trial 3. After the plots were marked, we performed vascular plant species identification on the nine plots (Gleason and Cronquist, 1991; Tiner, 1998). The percent cover of identified species was recorded using the protocol outlined by Mueller-Dombois (1974). Samples of all the species were taken, pressed at the Biological Field Station, and compiled into a species identification binder. The first three plots (labeled “A”) were the controls and contained zero percent leather-leaf and speckled alder cutting. In the second set (“B”), fifty percent of the leather-leaf and speckled alder plants were cut out of the total population. One hundred percent was removed from the third set (“C”). About a one foot border of leather-leaf and speckled alder was cut around all plots to reduce the edge effect and shading that could alter results. The cut plants were placed in plastic tubs and removed from the area.

RESULTS & DISCUSSION

The type and amount of species found in the plots are listed in Table 1. In 1994, Taylor found 140 species in Cranberry Bog, and although I only identified species on the mat, Taylor’s study demonstrated the great diversity at that time (Taylor, 1994). Conclusions about the effect of leather-leaf on plant biodiversity can be made only after future data are collected and compared to those obtained this year.

Table 1. Type and amount of species found on the Sphagnum mat prior to cutting leather-leaf and speckled alder (plots A1-A3 were the controls with 0% cut, B1-B3 were 50% cut, and C1-C3 were 100% cut).

<table>
<thead>
<tr>
<th>PLANT SPECIES</th>
<th>COMMON NAME</th>
<th>PERCENT COVER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SCIENTIFIC NAME</td>
<td>A1</td>
</tr>
<tr>
<td>Acer rubrum</td>
<td>red maple</td>
<td></td>
</tr>
<tr>
<td>Alnus incana</td>
<td>speckled alder</td>
<td>2.5</td>
</tr>
<tr>
<td>Andromeda glaucophylla</td>
<td>bog rosemary</td>
<td>15</td>
</tr>
<tr>
<td>Aronia melanocarpa</td>
<td>black chokeberry</td>
<td>0</td>
</tr>
<tr>
<td>Chamaedaphne calyculata</td>
<td>leather-leaf</td>
<td>62.5</td>
</tr>
<tr>
<td>Drosera rotundifolia</td>
<td>sundew</td>
<td>2.5</td>
</tr>
<tr>
<td>Eriophorum virginicum</td>
<td>cotton grass</td>
<td>0</td>
</tr>
</tbody>
</table>
### FUTURE RECOMMENDATIONS

Future researchers should record plant coverage percents to draw conclusions about whether managing leather-leaf and speckled alder positively affects plant biodiversity. Cutting inside the plots should not be continued; the edges should be cut annually to insure that results are not impacted by edge effects and shading. If cutting leather-leaf is found to be an effective and environmentally safe way to maintain biodiversity, the protocol might be recommendable for Cranberry Bog in larger scale in future years.

### REFERENCES


Nebraska Partners for Fish and Wildlife. 1999. Restoration Plan for the Jumbo and

