Final Report on:

The Role of Site Conditions and Moose Browsing Pressure in the Regeneration Failure of Balsam Fir Forests in Gros Morne National Park, Newfoundland

Project Leader: Emily Gray

Project Team Members: Kerri Moreau, Sara Laplante

Nipissing University

Department of Biology
With the generous funding provided by the Royal Canadian Geographic Society, I purchased airfare for my entire team, as well as equipment required for fieldwork. The Nipissing University Faculty Association, and Talon Research Assistantship Grants (granted by Nipissing University) also provided financial support. The contribution made by Nipissing University collectively covered the cost of our accommodations for 23 days at the Bonne Bay Marine Station. The funding required for the remaining expenses including vehicle rentals (for approximately 3.5 weeks), gas, supplies, and soil sample analyses (for 120 samples) were provided by Parks Canada. Parks Canada was also very supportive when the fieldwork was completed, as Park managers and biologists provided resources (including maps, and documents), and guidance throughout my project. Please refer to table 1 for a breakdown of the expenses incurred.

**Table 1. A summary of the expenses incurred throughout the research project.**

<table>
<thead>
<tr>
<th>Expense</th>
<th>Cost</th>
<th>Funded By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return trip flights (x3)</td>
<td>$1764</td>
<td>RCGS</td>
</tr>
<tr>
<td>Accomodations for 23 Days (food included) (x3)</td>
<td>$3105</td>
<td>Talon Research Assistantship &amp; Nipissing University Faculty Association</td>
</tr>
<tr>
<td>Vehicle Rental</td>
<td>$2500</td>
<td>Parks Canada</td>
</tr>
<tr>
<td>Gas</td>
<td>$500</td>
<td>Parks Canada</td>
</tr>
<tr>
<td>Equipment</td>
<td>$200</td>
<td>RCGS</td>
</tr>
<tr>
<td>Soil Sample Analysis</td>
<td>$4255</td>
<td>Parks Canada</td>
</tr>
</tbody>
</table>

Currently, all of the data for my project has been compiled and analyzed. My goal for this project was to completely survey 3 nested plots (10 x 10 m) at 40 different locations throughout Gros Morne National Park; 20 from recovering forested areas and 20 from forests with failed regeneration. With the help of my
team, we surveyed all 120 plots, achieving the goal of the project. Within each plot the growth variables (listed below) and browse variables (listed below) of three tree species at each of the 3 life stages was recorded. Overall, the objectives of my study were met; I identified specific stress factors that may be influencing the growth/density of balsam fir in areas that are regenerating and those that are not. Moreover, my results showed there is still a large difference in the size and density of balsam fir seedlings and saplings between areas designated as regenerating and those not regenerating.

Environmental Variables:
- Percent cover of 6 invasive plant species
- Soil depth
- Moose pellet counts
- Canopy Closure
- Soil samples

Growth Variables:
- Height
- Basal diameter
- Diameter at breast height
- Density

Browse Variables:
- Presence of clipping
- Presence of lateral browse

The fieldwork that was completed in Newfoundland will support my fourth year honours thesis, which will be completed by April 30, 2012. I will also be presenting a poster on my project on April 23, 2012. Thank you again for the generous contribution to my research project, I look forward to sending you the finished product shortly after my thesis document is completed and submitted for evaluation.