Effect of mowing on *Sphagnum* regeneration in a disturbed peat bog

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Mowing cessation could promote *Sphagnum* moss regeneration in the degraded Garden City Lands Peat Bog

Introduction

- Peat bogs are globally important but threatened ecosystems which sequester huge quantities of carbon
- *Sphagnum* mosses are keystone species
- The Greater Lulu Island Peat Bog in Richmond BC was degraded and fragmented by settler activity; one extant piece is the Garden City Lands Peat Bog (GCLPB)
- Restoration efforts are underway at the GCLPB but *Sphagnum* populations remain low
- The bog is mowed every year to manage invasive trees, but this may have unintended consequence
- This research was established to assess the impacts of mowing on *Sphagnum* regeneration

Methods

- Randomized complete block design with 24 6 x 6 m plots established in 2019
- 12 plots have been mowed every fall, while the other 12 have been undisturbed
- Data collected in fall 2022 prior to mowing
- Soil moisture was measured at 0-20 cm depth using a soil moisture meter
- *Sphagnum* was quantified using 2 transects/plot
    - Length of intercepted *Sphagnum* was recorded
    - Intercepted *Sphagnum* was rated for density and vigour
    - Length, density, and vigour were combined into *Sphagnum* Regeneration Index (SRI)

Statistical analysis: paired samples t-test

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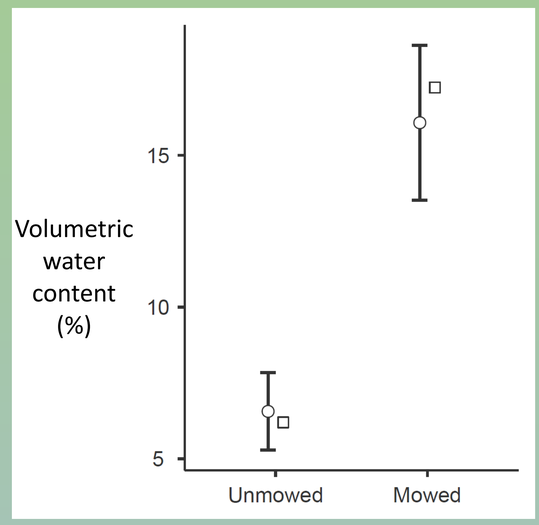
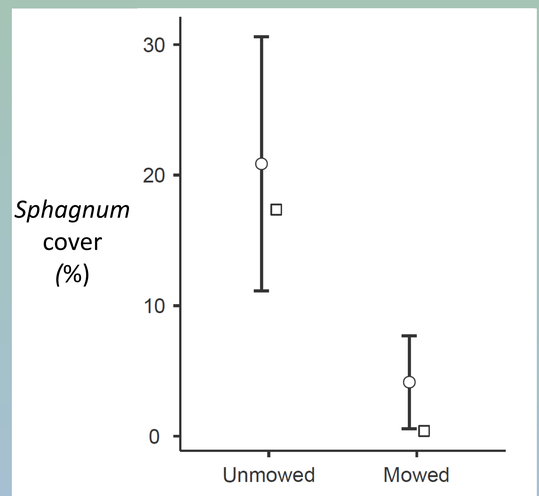
Results





Soil moisture (top) and *Sphagnum* cover in plots that were unmowed between 2018 and 2022 vs. plots mowed in fall 2019, 2020, and 2021. Error bars denote 95% confidence interval around mean (n = 12). Small squares show medians. Treatments differ significantly (t-test, $p < 0.05$).

Discussion

Ceasing mowing may help *Sphagnum* regeneration (and perhaps by extension the overall ecosystem restoration effort) in areas of low invasive tree pressure

Various factors could have contributed **to increased *Sphagnum* regeneration** in unmowed plots:
- Increased shade/protection from UV
- Higher relative humidity
- Decreased air circulation
- Reduced physical disturbance of *Sphagnum*

Lower soil moisture likely resulted from increased transpiration from the maturing shrub canopy. This finding is notable, as it shows soil moisture is not necessarily the determining factor in *Sphagnum* regeneration