Analysis of the Woody and Herbaceous Deer Browse Data from Griffy Lake Nature Preserve 2018-2022

Analysis

For the woody plant data, spicebush was excluded due to non-preference by deer. Additionally, all heights above 1m were not included because they were above deer browse height. While some browse was evident on taller individuals and spicebush, it was a small percentage of the total foliage and unlikely to significantly affect the overall vigor. Woody plant species mean height and mean root collar diameter (rcd) were analyzed by samples year (2018,2019,2020,2021,2022) using a repeated measures one-way ANOVA ($\alpha = 0.05$) test. For herbaceous data (Solomon's seal and Jack-in-the-pulpit), mean height was also analyzed by sample year using a repeated measure one-way ANOVA ($\alpha = 0.05$) test. If significant differences were found within the data, Holm-Sidak multiple comparison tests ($\alpha = 0.05$) were used to compare individual years. All data was evaluated for and met assumptions of normality.

Results

The woody data showed a backslide on both mean height and mean root collar diameter this year. The change in root collar diameter was clearly linked to the dry summer and the lack of soil moisture when the measurements were taken between August 30th and September 1st. The low soil moisture resulted in shriveling of the root collar, hence the decline in diameters. The reasons for the decline in height are less clear but may be related to mortality of some of the larger saplings. Most saplings never mature into trees, meaning there is high mortality on the studied age class, especially during times of drought stress.

The herbaceous data was more consistent with previous years, showing increases in the height of both Solomon's seal and Jack-in-the-pulpit. Solomon's seal showed significant increases between 2018-2022 ($p<0.000003$), 2019-2022 ($p<0.0000002$) and 2020-2022

(p<0.005). The height of the Jack-in-the-pulpit showed a significant increase from 2019-2022 (p< 0.05) and nonsignificant increase when 2022 was compared with 2018, 2020, and 2021.

Figure 1: Sapling Root Collar Diameter. Letters indicate nonsignificant decline for 2022

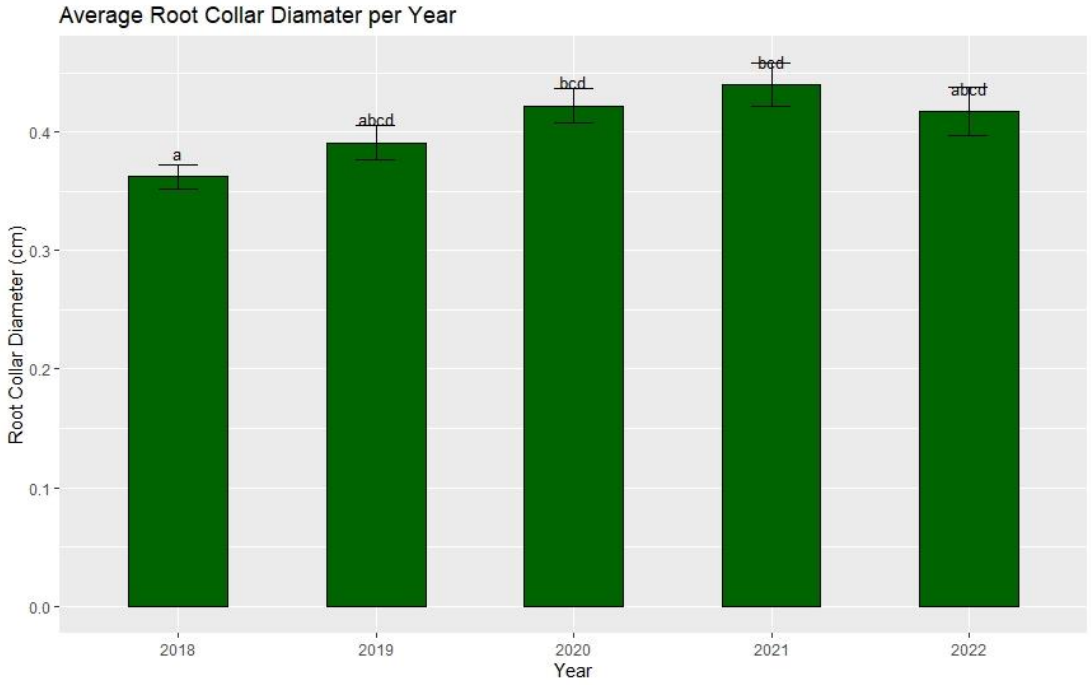

Figure 2: Sapling height. Letters indicate nonsignificant decline for 2022

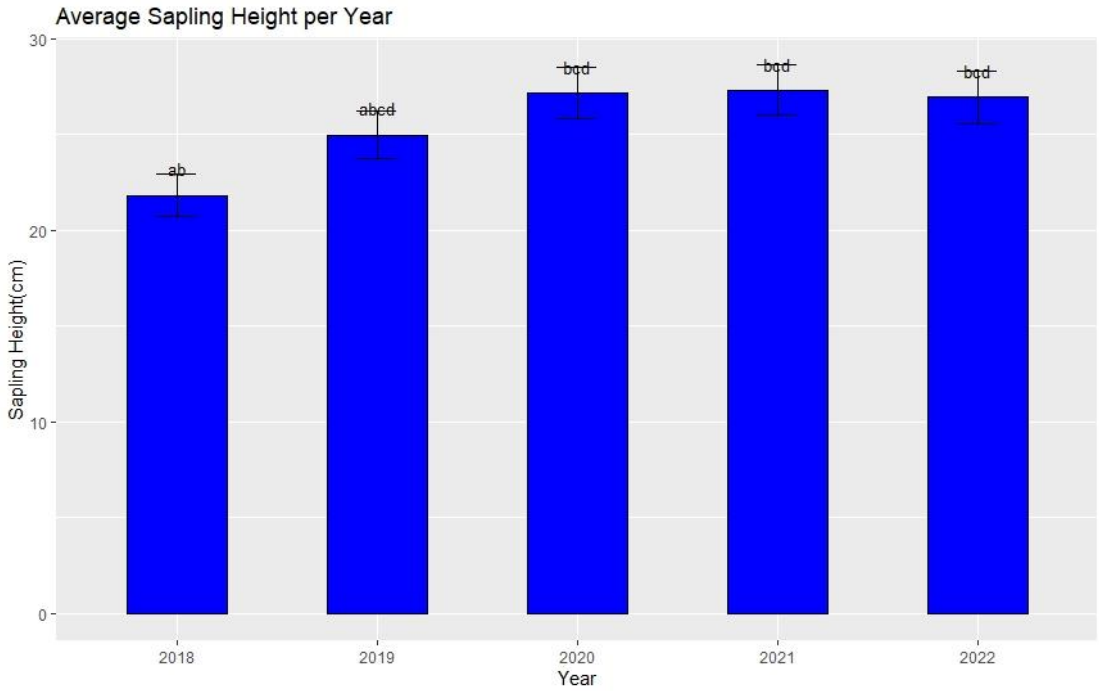

Figure 3: Solomon's seal height. Letters indicate significant increases for 2018-2022

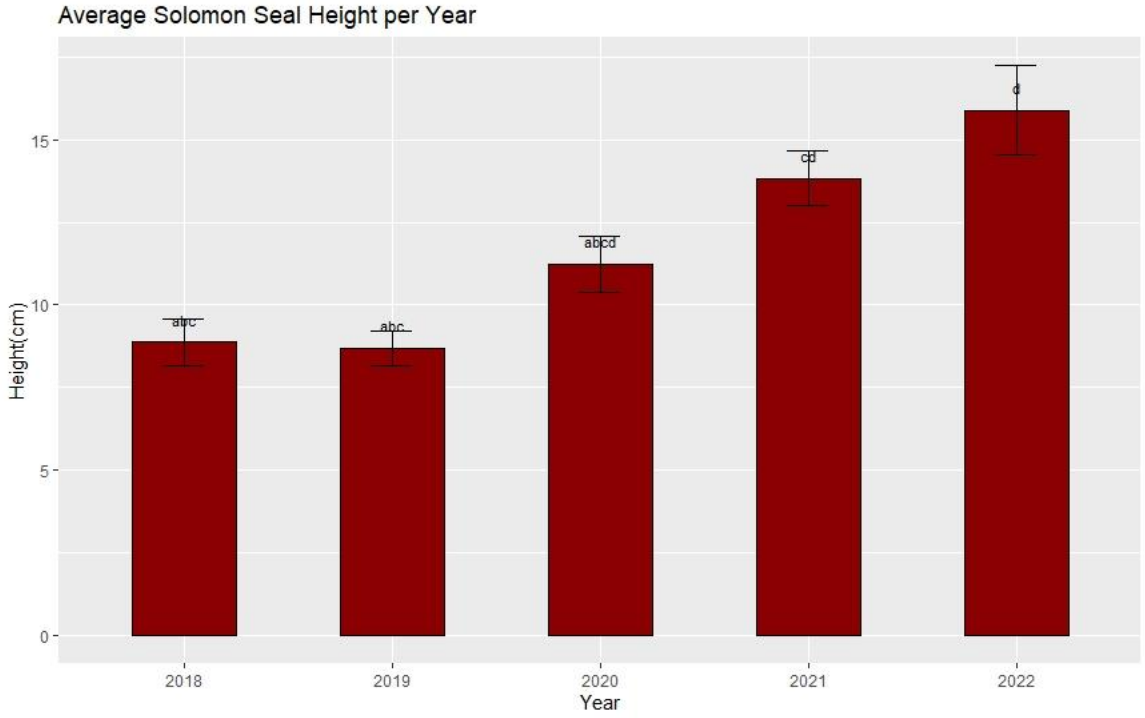

Figure 4: Jack_in_the_pulpit height sowing a significant increase in 2019-2022