

Burning For Biodiversity: Tracking Native Plant Recovery in High Park

Background

- Remnant oak savannah and tallgrass prairie ecosystems are among the most unique and threatened vegetation communities in southern Ontario
- The City of Toronto has been implementing prescribed burns in High Park to restore and sustain these habitats
- The Floristic Quality Index (FQI) is a quantitative measure to express the quality of an ecological site based on species composition [1]

Objectives

- Quantify site quality of burned sites using the Floristic Quality Index (FQI)
- Evaluate if woody invasive species and canopy openness have an impact on savannah quality
- Assess the impact of prescribed burning on plant recovery in black oak savannah

Methodology

- In June 2025, 16 fixed-area plots were evaluated in black oak savannah burn sites in High Park using Vegetation Sampling Protocol (VSP) [2] (Figure 1).
- Species were assigned a Conservatism Coefficient (CC) value and averaged to calculate FQI. High ranking species are found in high quality plant communities that reflect pre-settlement conditions [1]
- Linear models were used to assess the relationship between burn frequency and average CC-values across plots, and canopy cover and invasive species.

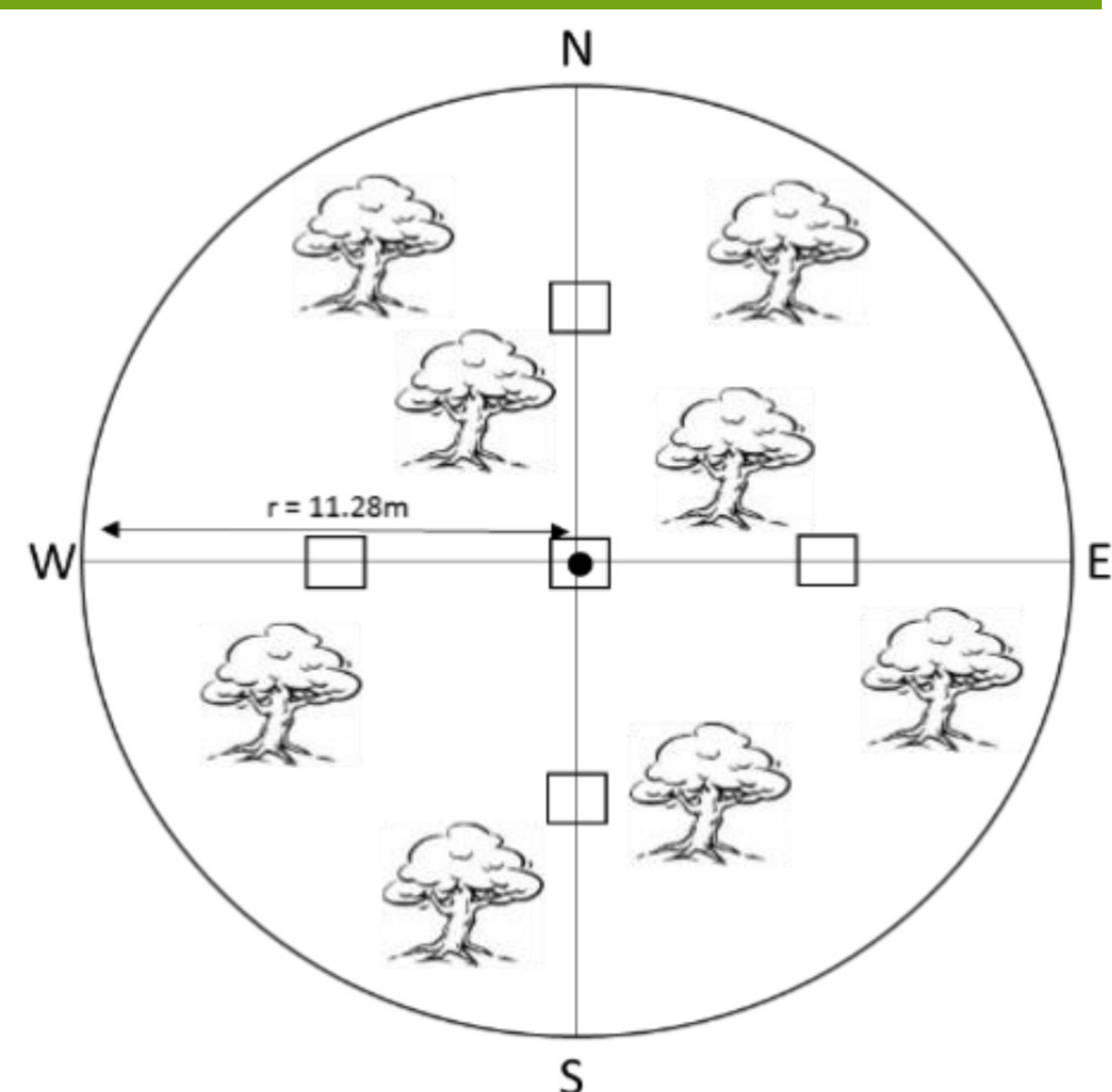


Figure 1. VSP sampling plot (400m²) (Puric-Mladenovic & Baird 2017)

Results

Areas with higher burn frequency have plots with a higher average CC-value, indicating higher floristic quality (Figure 2).

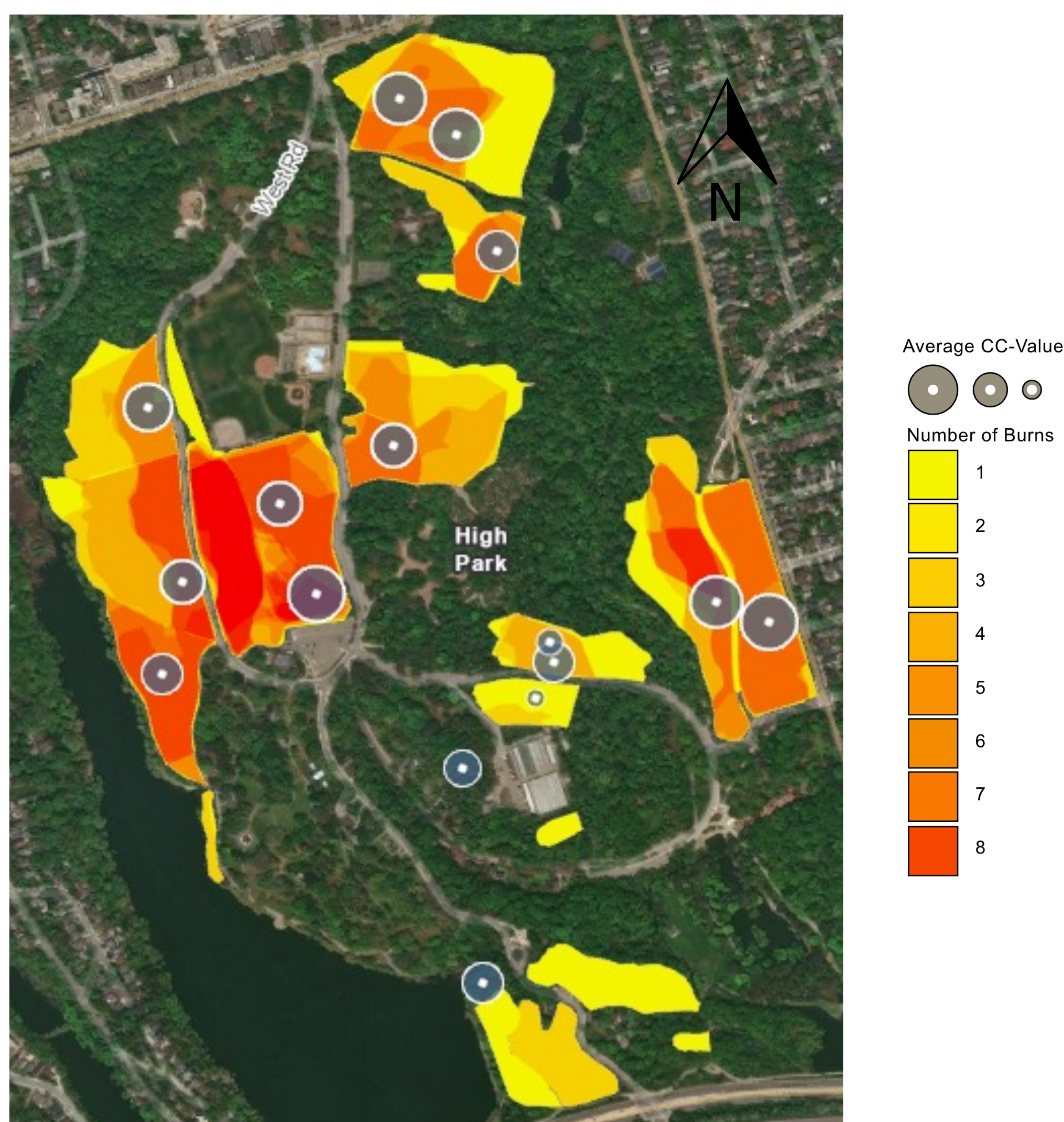


Figure 2. Burn frequency and average Conservatism Coefficient (CC) values are displayed: low burn frequency (1) is shown in yellow, high burn frequency (8) in red, and plot points with larger rings indicate higher average CC-values.

The results indicate that the number of times a plot has been burned has a **significant positive effect** ($p=0.0188$) on the average CC-value of the plot (Figure 3).

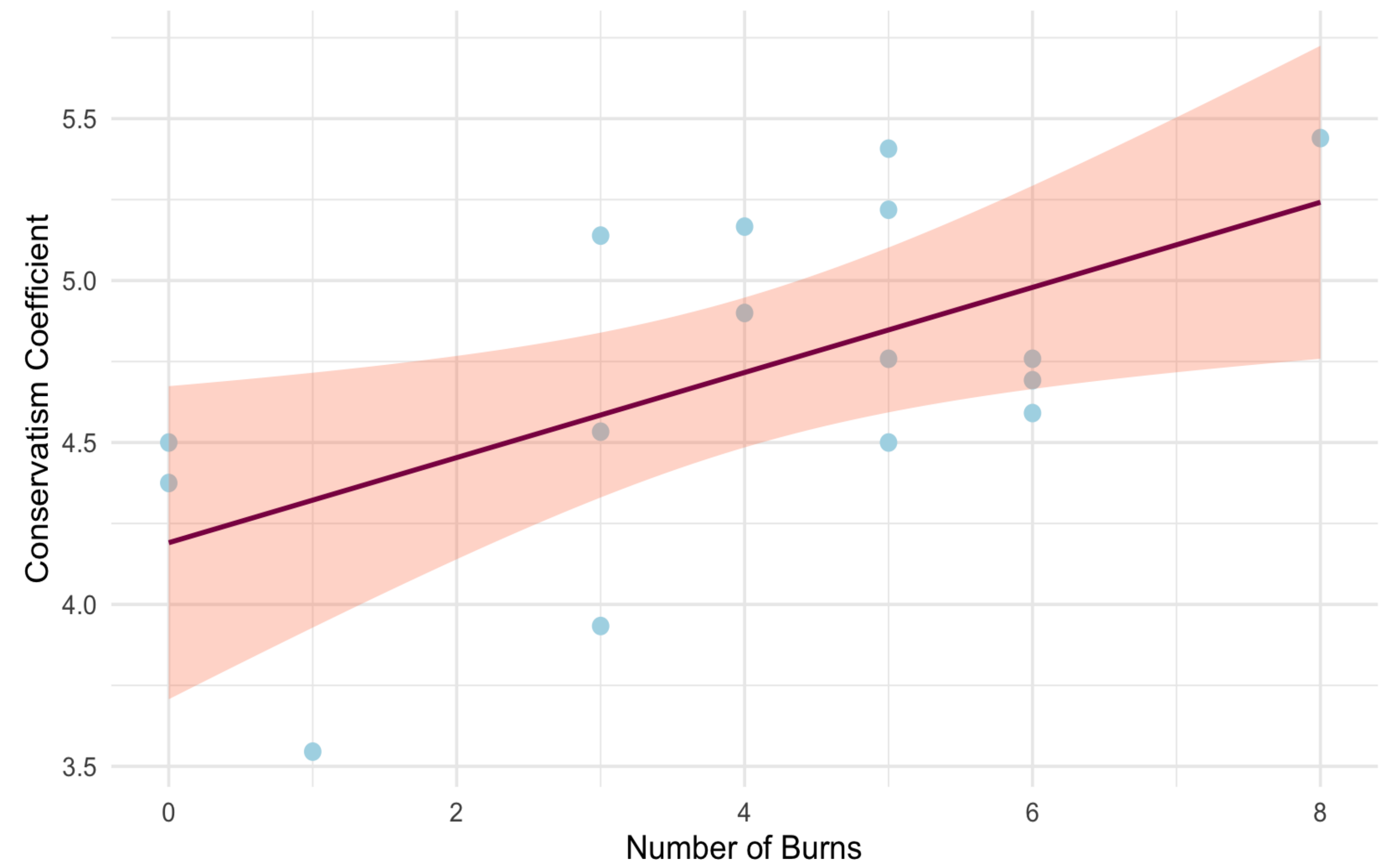


Figure 3. The relationship between burn frequency and average Conservatism Coefficient

A **significant negative relationship** ($p=0.03622$) was found between canopy cover and woody invasive species (Figure 4). Open canopies had a higher incidence of invasive woody species, while closed canopies showed a significant decrease in invasive woody species encroachment.

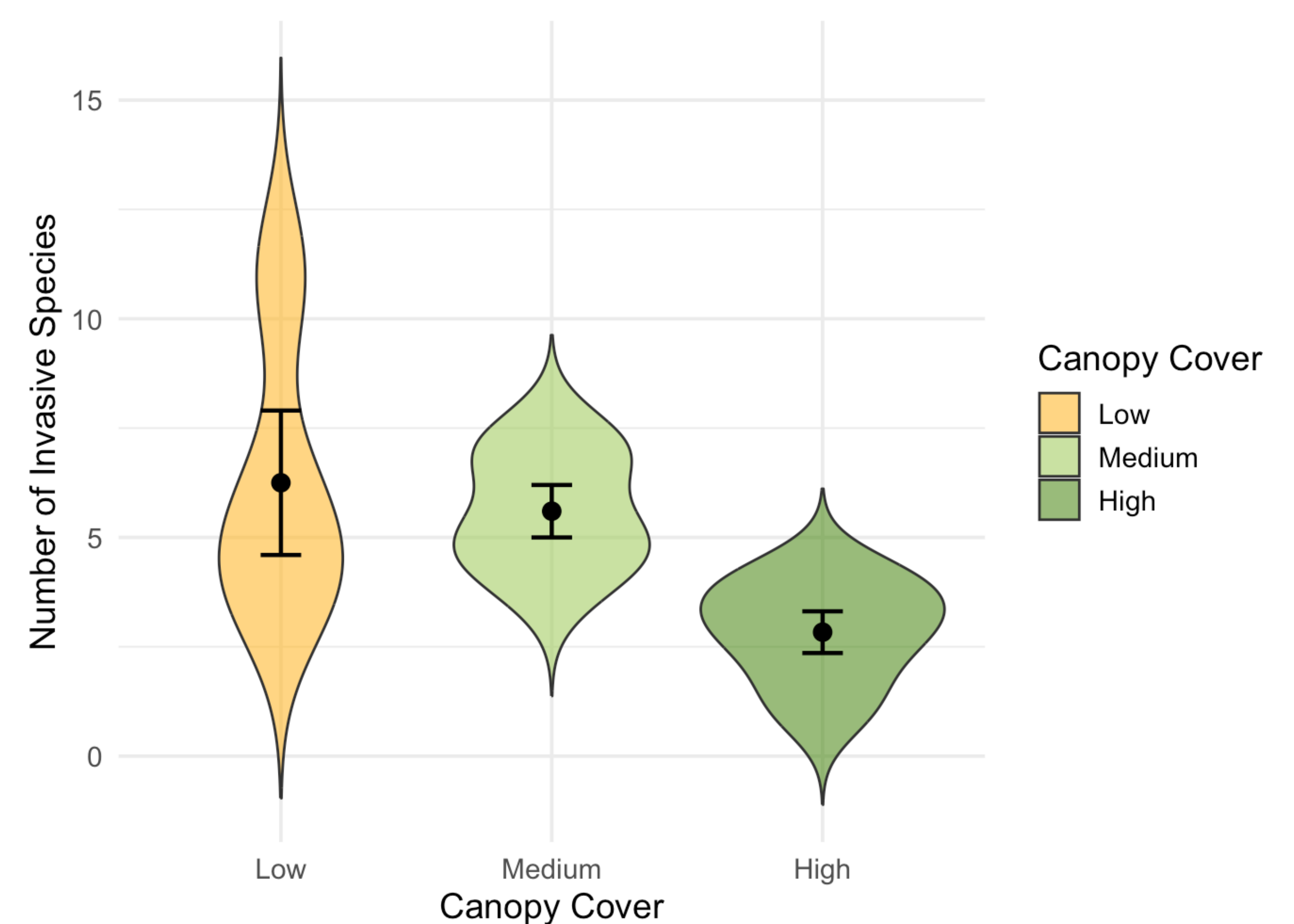


Figure 4. Relationship between canopy cover and woody invasive species abundance

Conclusion

- As prescribed burn frequency increases, the FQI of a site increases, therefore the burns in High Park have shown success in increasing site quality if repeated (Figure 3)
- Open canopies are associated with a higher abundance of woody invasive species, therefore proactive management is needed to mitigate woody encroachment on post-burned sites (Figure 4)
- This work highlights the benefits of controlled burns in black oak savannah habitats in High Park

Acknowledgements

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References

1) Rooney, T. P., & Rogers, D. A. (2002). The modified floristic quality index. *Natural Areas Journal*, 22(4), 340-344.

2) Puric-Mladenovic, D., & Baird, K. (2017). Natural Areas Monitoring in the City of Guelph: Emerald Ash Borer impact on Ash populations in natural areas. *Faculty of Forestry*.