



Erie Street Cemetery Tree Condition and Pest-Risk Analysis

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ABSTRACT

Urban forests are incredibly distinct ecosystems existing directly within city and town centers. Parks, green spaces, street trees, gardens, and even trees found in residential or commercial spaces comprise what we define as an urban forest. These forests provide numerous ecosystem services that can increase quality of life in cities (1). However, the health of the urban forest is essential to the effectiveness of ecosystem services so it is important to not only plant new and diverse trees, but to evaluate the health and condition of trees in urban spaces.

REFERENCES

1. U.S. Forest Service. (n.d.). *Urban Forests*. <https://www.fs.usda.gov/managing-land/urban-forests>

INTRODUCTION

Erie Street Cemetery is located in Cleveland, OH off of East 9th Street and East 14th Street. The cemetery was created in 1826 and is now a historical landmark. Today, Erie Street Cemetery is surrounded by urban area. The individual trees that were surveyed provide combined benefits of:

- \$30,934 of carbon storage
- \$1,950/yr of pollution removal
- \$573/yr of gross carbon sequestration
- \$342/yr of avoided runoff

METHODS AND MATERIALS

To understand the overall health and condition of trees at Erie Street Cemetery, 14 students conducted a survey of the site as an extension of the Cleveland State University Campus urban tree study. The surveys consisted of health assessments including measurements of diameter at breast height (DBH), soil access, canopy exposure, crown dieback, crown discoloration, major branch issues, major bark issues, and insect exit holes.

Student data was compiled in Excel and entered into i-Tree Eco software to analyze the provided ecosystem services, structure, condition, composition, economic value, and management analyses of the site. Graphs were produced in RStudio and Excel. GPS points were plotted by students using QField and uploaded to ArcMap and QGIS to create the maps.

FURTHER RECOMMENDATIONS

- 70% of trees currently at Erie Street Cemetery are susceptible to insects and disease.
- Gypsy moths have a potential replacement value of \$82,000.
- Additionally, large aspen tortrix poses a risk of a replacement value of \$65,500.

Trees located at Erie Street Cemetery have proven to be in fair/poor health. The majority of trees are large and there has been no recent planting of young trees or new species for decades.

Species that would be potentially beneficial to the site would be pest-resistant species as well as species not already present to increase diversity. Future development should focus on this diversity to avoid losing the collection to invasion. Additional management should include chemical and mechanical treatments to prevent or mitigate invasive pests.

RESULTS

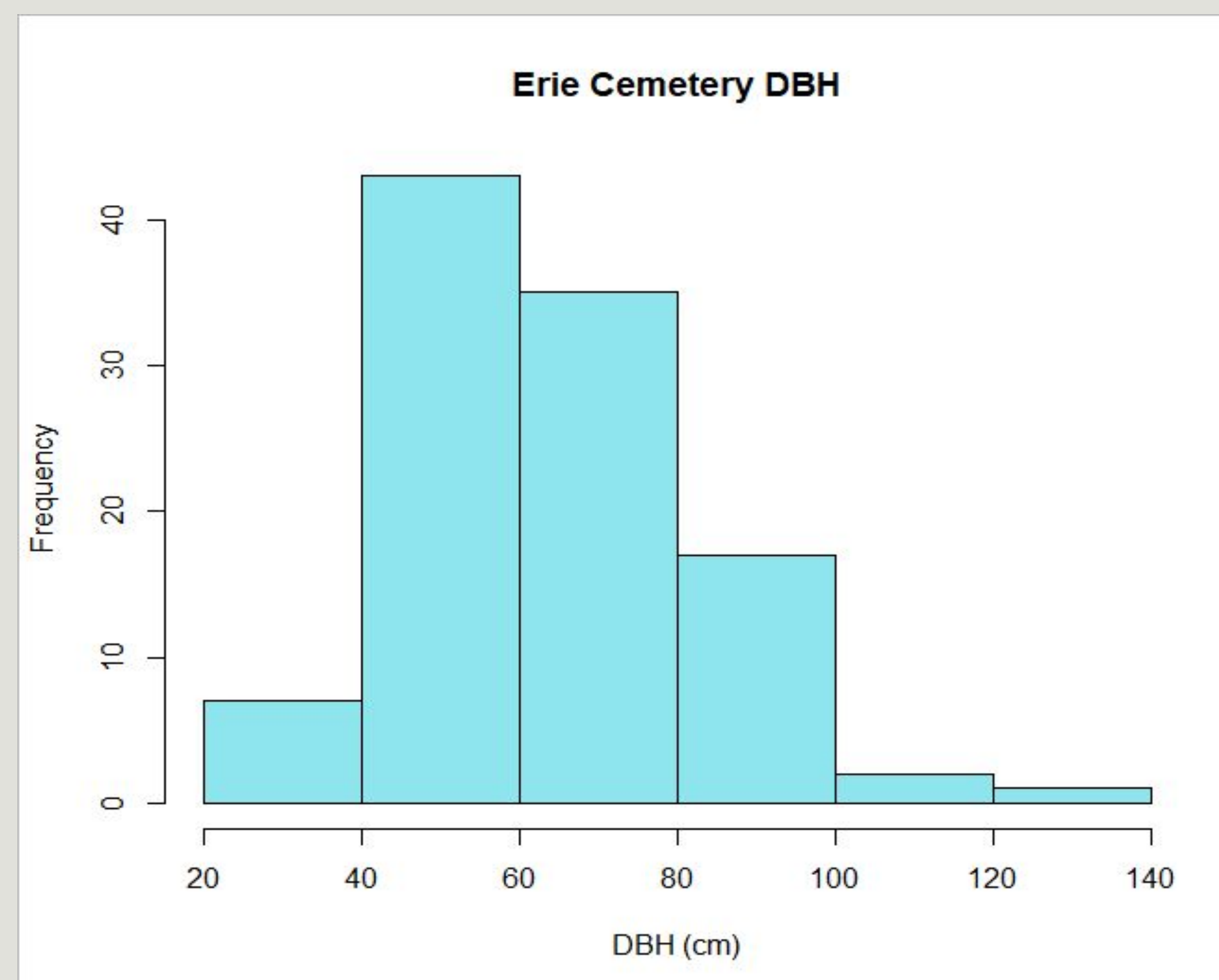


Figure 1: Frequency of the diameter at breast height (DBH) for trees in Erie Street Cemetery

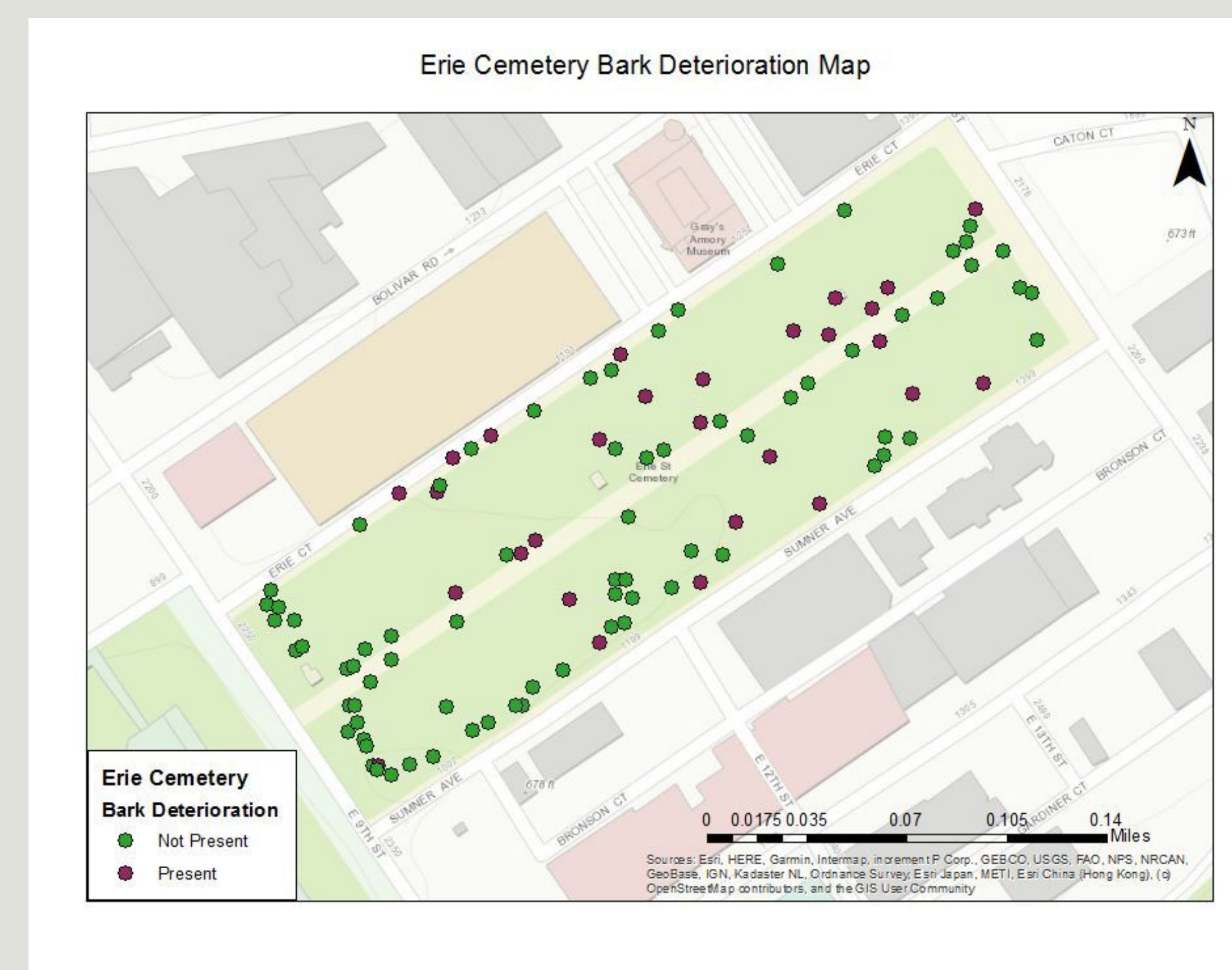


Figure 2: Distribution of trees in Erie Street Cemetery showing presence or absence of major bark issues

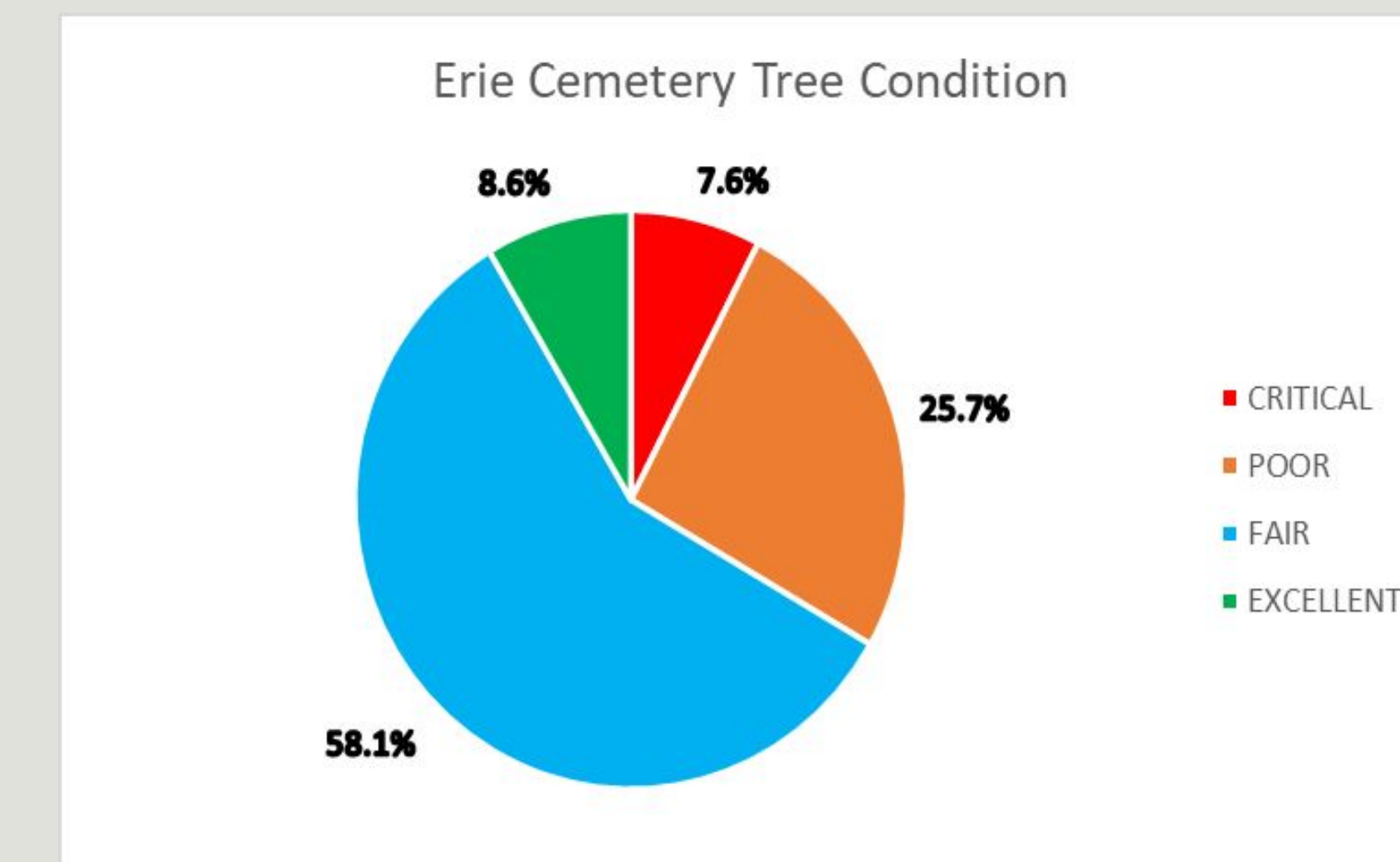


Figure 3: Percent of trees at Erie Street Cemetery in excellent, fair, poor, or critical condition

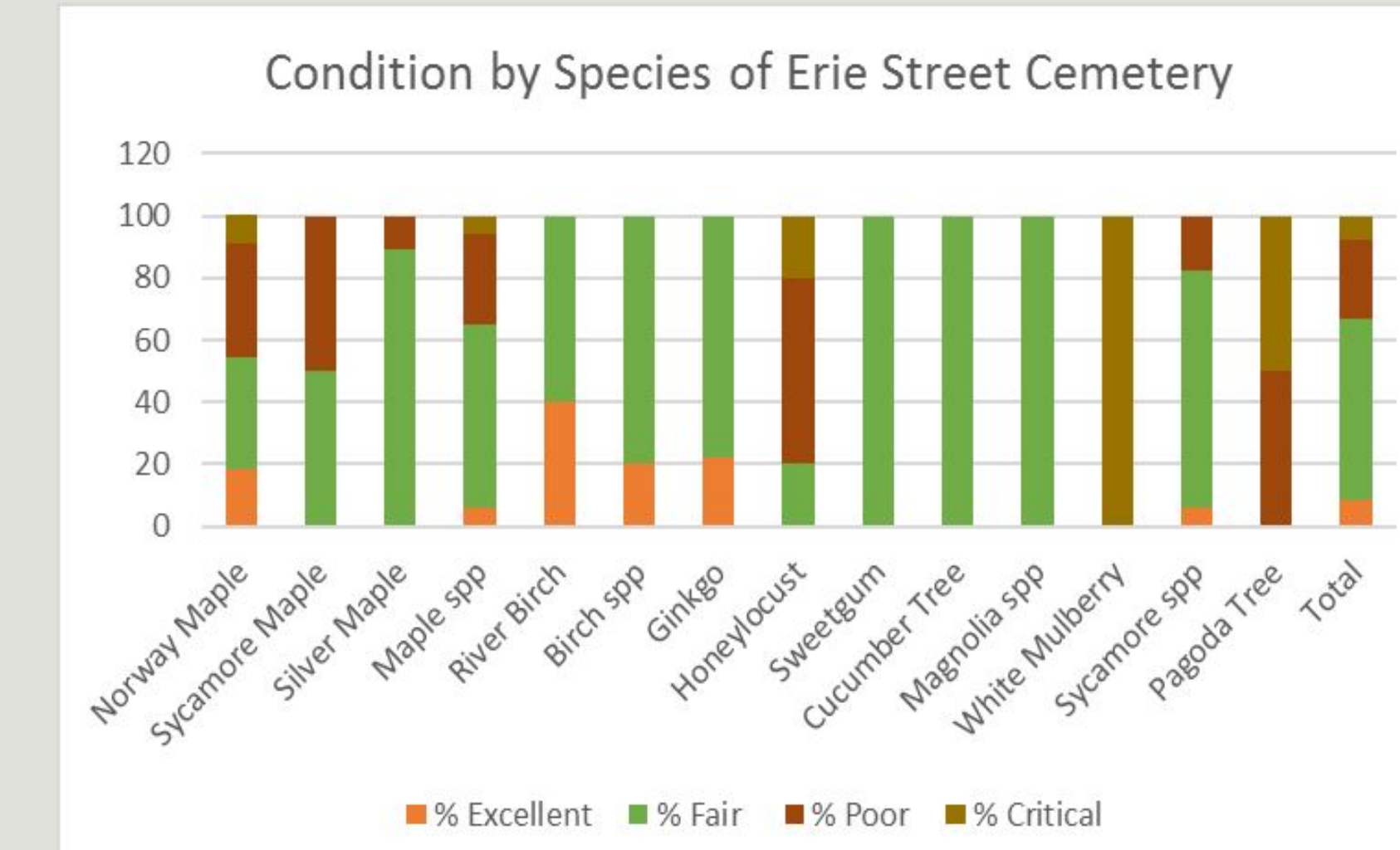


Figure 4: Percent of 14 species of trees and total trees at Erie Street Cemetery in excellent, fair, poor, or critical condition

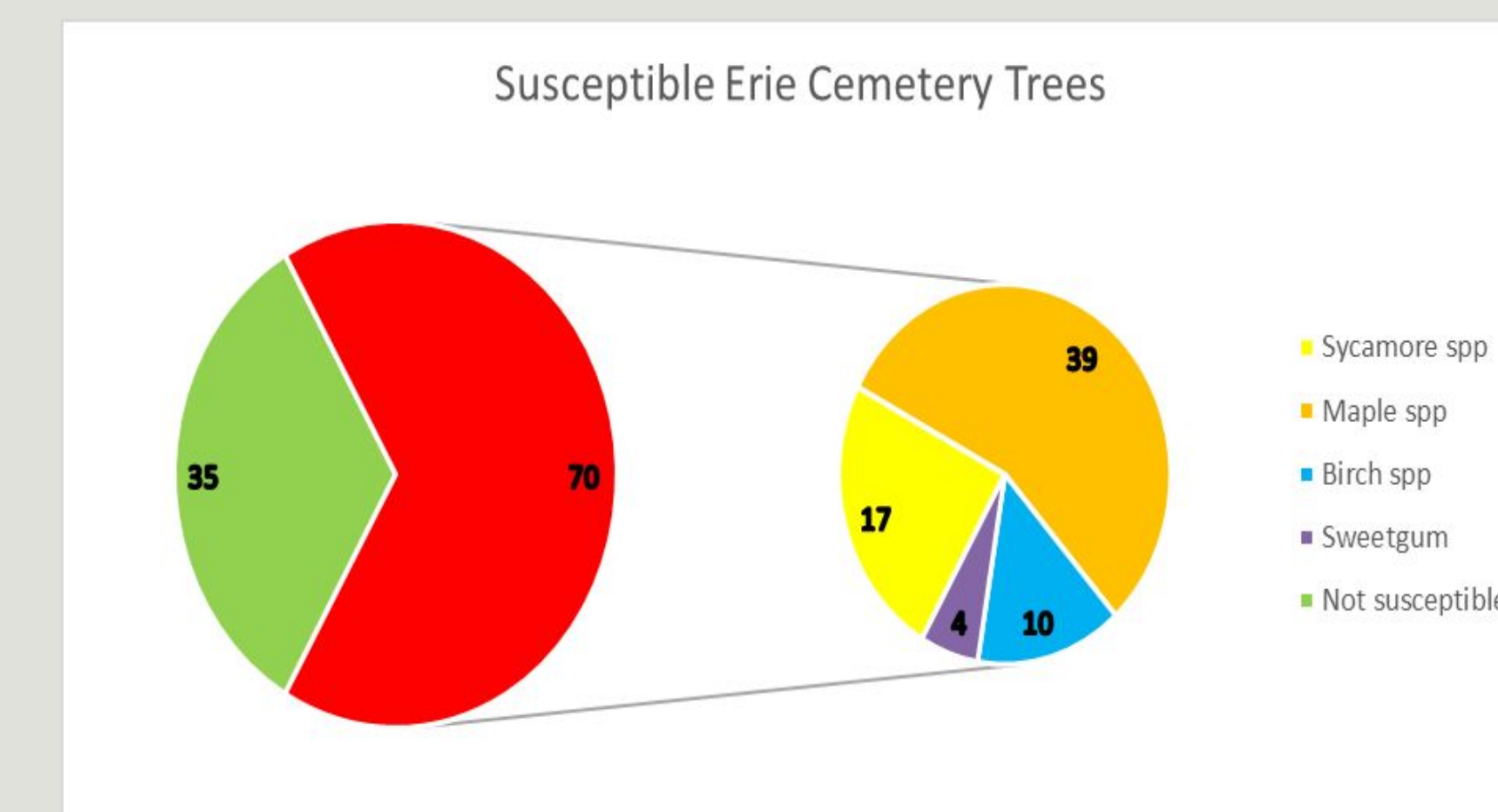


Figure 5: Number of trees at Erie Street Cemetery that are susceptible to invasive pests in or near Cuyahoga County