

"Rediscovering Emma J. Cole's 19th-century *Grand Rapids Flora*"

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Background

Project History

In 1901, renowned botanist and teacher Emma Cole published *Grand Rapids Flora: A Catalogue of the Flowering Plants and Ferns Growing Without Cultivation in the Vicinity of Grand Rapids, Michigan*. 116 years later, Emma Cole's book is still the most comprehensive floristic study of the Grand Rapids area, despite immense changes in land use for the area.

Our Project

In the third year of our 5 year project, we continue to repeat Cole's work, botanizing the greater Grand Rapids area. The aim of our project is to revisit the sites that Emma Cole visited, or similar sites, and see how the plant life of Grand Rapids has changed over the past 116 years.



Figure 1-
Emma Cole (1845-1910)



Figure 2-
Grand Rapids Flora (1901)



Figure 3-
Dave Warners, Peter Quakenbush, Jenna Van Donselaar, and Devani Antuma explore Dead-Lake Bog, which is in superb, natural condition.



Figure 4-
Devani Antuma and Jenna Van Donselaar explore Marne Bog- which has been overrun by cattails.

Methods

General

- The flora of seven localities were inventoried in detail.
- Species flowering or fruiting were collected and identified.
- Habitats were described, and species lists were prepared
- Floristic Quality Assessments were made for each site to ascertain the floristic and ecological value of the sites, which is useful for conservation and preservation efforts.

FQI

Each plant native to Michigan has a number assigned to it called the coefficient of conservatism (C), which reflects the plant's fidelity to undisturbed habitat. The Floristic Quality Index (FQI) is a quantitative measurement, obtained by multiplying the average C for each site by the square root of the total number of plant species. We used the program found at universalfqa.org to assess our sites. FQIs are helpful in comparing the overall ecological integrity of various locations.

Locations

Site specifics

Sites inventoried across the greater Grand Rapids area:

- Dead-lake Bog (Sphagnum Bog)
- Grand Ravines Park (Ravine Forest/Field)
- Hager Park (Forest/Field)
- Grand River Park (Forest/Field)
- Hilbrand's property (Deep Ravine Forest)
- Indian Creek (Regenerating Forest/Swamp)
- Marne Bog (Swamp forest/Cattail Marsh)

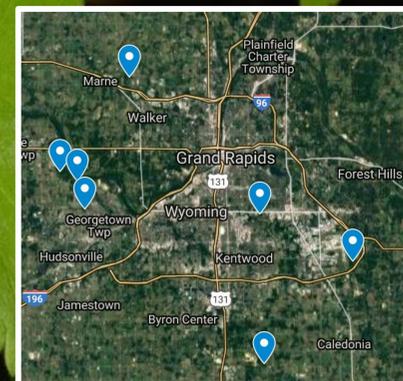


Figure 5-
Map of research sites. All sites are in Kent & Ottawa counties.

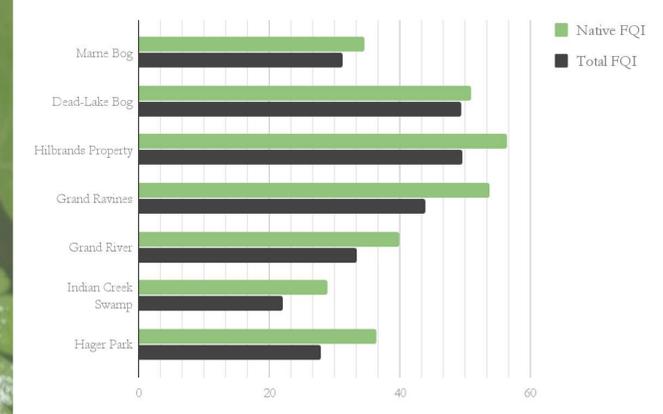
Results

Throughout the summer, we:

- Collected 1420 voucher specimens documenting flora
- Compiled species lists for 7 different sites
- Determined floristic quality indices (FQIs) for all 7 sites
- Discovered several species that were New County Records
- Rediscovered 3 species not collected in Grand Rapids area since 1890s

FQI

Figure 6-
Calculated FQI for each site, with & without invasives included. FQI < 20 has minimal significance. FQI > 35 is considered significant floristically.



Species of Interest

Figure 7-
Swamp mallow (*Hibiscus moscheutos*) had not been found in Grand Rapids since 1898. In fact, Emma Cole was the last person to collect it.



Figure 8-
Spatulate leaved sundews (*Drosera intermedia*). A carnivorous plant and a sign of a healthy bog.

Figure 9-
Horned bladderwort (*Utricularia cornuta*). Another carnivorous plant found in wetlands. It has a coefficient of conservatism of 10.



Figure 10 -
Asimina triloba (PawPaw). This fruiting tree is a southern species, and it was collected near its northern limit. It has a coefficient of conservation of 9.

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