

# The Emma Cole Project: Reevaluating the Flora of Grand Rapids

William Hofmann, Hayden Janssen, Martin Vanderschoot, Dr. Garrett Crow, Dr. David Warners  
Calvin University, Grand Rapids, Michigan



## Background

In 1901, botanist and teacher Emma Cole published an account of all the vascular plants in the Grand Rapids area, which is the most comprehensive documentation of the flora in the area today. The vicinity of Grand Rapids has been developed significantly since then, and with it the surrounding natural spaces have also been greatly altered. Over the past 7 years, Calvin University's Emma Cole Project has been inventorying the flora of greater Grand Rapids and comparing modern plant life with the flora during Cole's time 120 years ago. This project strives to both verify species' presence around Grand Rapids and look into the impacts of increased urbanization on plant distributions.

## Methods

- Select 9 natural area sites for botanical studies
- Conduct botanical inventories to document all species over the 2022 growing season
- Collect, press, and dry specimens to be maintained in the Calvin University Herbarium
- Identify plants using Field Manual of Michigan Flora (Voss and Reznicek 2012)
- Perform Floristic Quality Assessments (FQAs) to determine the quality of each site

FQA Range	Site Quality
<20	Low quality, reflecting human disturbance
20-35	Average quality
35-50	Fairly high quality, natural
>50	Pristine, extraordinarily high quality

Table 1: Description of what FQA value ranges represent

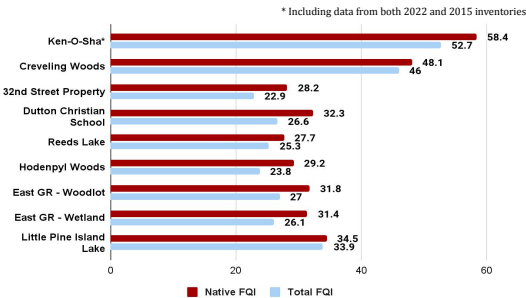
## Study Locations



## Results: Floristic Quality Assessments

- 631 herbarium specimens were collected
- 100 Families, 247 genera, 422 species
- 72% native species, 28% non-native
- 12 county records (according to michiganflora.net)

Only one of the sites (other than Ken-O-Sha, which has been inventoried previously in this project), the Creveling Woods, was of fairly high quality, as it was a previous maple syruping operation site which contributed to its remaining a quality natural area. The rest of the sites were of average or low quality, suggesting heavy human disturbance.



Graph 1: The native and total FQIs for our sites; Total FQI includes native and non-native species, while Native FQI only includes native species.

## Species of Interest

### Nonnative County Records

Due to many of the sites being degraded, plenty of invasive species were found throughout, which resulted in low FQIs. Some of these have the possibility to outcompete native species and harm the ecology of local sites. A few these species are new and/or have growing populations in Kent County, including:

- *Acer campestre* (Hedge Maple)
- *Acorus calamus* (Sweet-flag)
- *Carex sylvatica* (Sedge)
- *Ligustrum obtusifolium* (Border Privet)
- *Lysimachia vulgaris* (Garden Loosestrife)



- *Melissa officinalis* (Lemon-balm)
- *Persicaria longiseta* (Creeping Smartweed)
- *Setaria faberi* (Giant Foxtail)
- *Viburnum lantana* (Wayfaring Tree)
- *Vincetoxicum nigrum* (Black Swallow-wort)

### Native County Records

Despite how degraded most of the sites were, we were able to record a few native Kent County records. These include:

- *Chasmanthium latifolium* (Wild-oats)
- *Utricularia geminiscapa* (Bog Bladderwort)



Images from michiganflora.net

## Acknowledgements

We would like to thank the Calvin Biology Department for giving us working space in the Calvin Herbarium. We would also like to thank the Calvin University Science Division, Michigan Botanical Foundation, Michigan Botanical Club, Jansma Fellowship, Hanes Foundation, and Rozema and Star Fellowship for helping to fund this project. Our gratitude also goes to the Creveling Family for allowing us to access their tract of woods next to Little Pine Island Lake.