

**Fall 2008 Floristic Quality Assessment of
Minnie Skwarek Nature Preserve,
Spring Lake Township, Ottawa County, Michigan**

Report for the Land Conservancy of West Michigan
by Calvin College Plant Taxonomy (Biology 346) students with
Professor David Warners

October-November, 2008



Introduction

As more and more land is developed for cities and subdivisions it is necessary to recognize the importance of natural habitats and work to preserve their presence especially within landscapes that are dominated by human activity. These areas are home to many species of animals and plants that are key components for maintaining ecosystem health. Natural areas also provide aesthetic, recreational, spiritual and pedagogical value. They are constant reminders that the world is much bigger and more beautiful than what human beings can create. We show much wisdom when we ensure their perpetuation long into the future.

However, given the constraints and compromises inherent in land preservation efforts, when met with limited resources, it is important to be able to evaluate which areas are most valuable to protect. A good tool for helping to assess a site's natural quality and integrity is the Floristic Quality Index (FQI). This index is based upon a botanical inventory of a particular site. To learn more about this process and to improve on the Land Conservancy of West Michigan's (LCWM) understanding of one of its preserves, students from the Plant Taxonomy class (Biology 346) at Calvin College conducted a botanical inventory to generate an FQI for Minnie Skwarek Nature Preserve (located in Ottawa County, Michigan, on Leonard St. between 148th and 152nd). This 24 acre preserve was acquired in 2001 by LCWM and to date had only been evaluated with a preliminary survey by Doug Powless and Heather Sahli. The class made three trips to Minnie Skwarek Preserve in the fall of 2008: October 2, 16 and November 6. The first visit was used to become acquainted with the area, while the second and third visits were designated for plant collection and identification.

Methods

We divided the preserve into four areas to be inventoried by four groups of Calvin College students. Two areas were upland sites (upland one and upland two) and two were wetland sites (wetland one and wetland two) as shown in the accompanying map (Figure 1).

Wetland one was surveyed starting at the northern end of the preserve, continuing southward along the floodplain. The team reviewing wetland two began along the southern border at the river shore and moved in a northeast direction into the preserve. Upland one was surveyed from the southern border to the

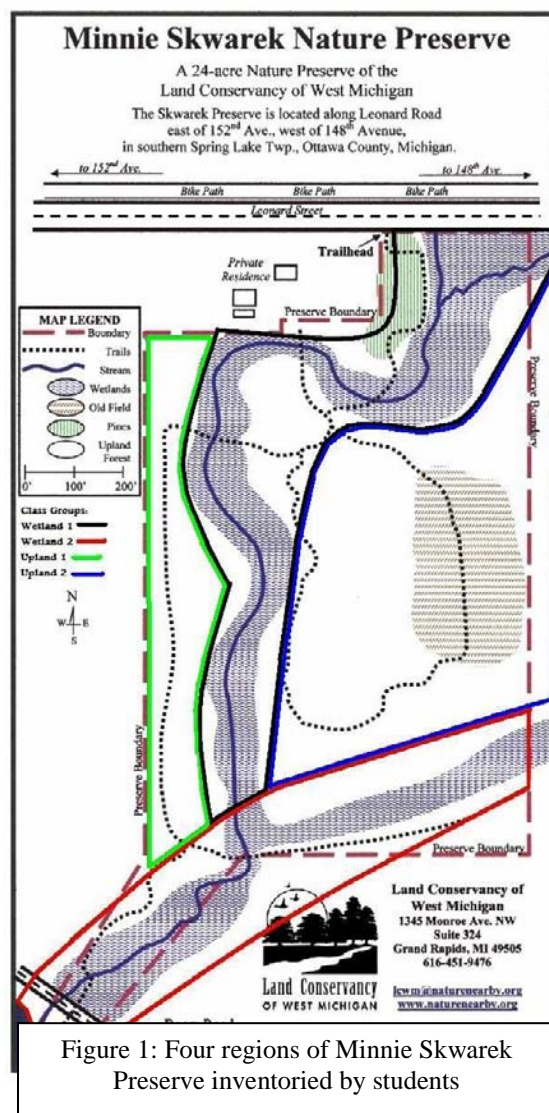


Figure 1: Four regions of Minnie Skwarek Preserve inventoried by students

north. This group started by identifying the larger trees and shrubs growing in the area, and then focused on smaller shrubs and herbaceous plants growing in the undercover. Upland two was systemically investigated from north to south.

All four groups surveyed their project sites twice using botanical field guides. Unidentifiable plants were collected as specimens, pressed and dried, and later identified in the lab. Many of these plants were prepared as herbarium specimens and are housed in the Calvin College Herbarium (contact D. Warners for access). A few taxa were only identifiable to the genus level. The species were entered into an excel spreadsheet and those identified to the species level were analyzed using the Michigan Floristic Quality Assessment (Herman, et al. 1996).

Results:

Plant Species and FQI

A total of 227 species were identified (Appendix A). This detailed species list contains scientific names, common names, coefficients of conservatism (0-10, indicating degree of fidelity to undisturbed habitat), and coefficients of wetness (-5 to +5, indicating probability of occurrence in a wetland habitat). Of the total 227 species, we identified 16 ferns and fern allies, 33 species of graminoids, 106 herbaceous dicots and 72 woody species. In total, 192 of these are native Michigan plants while 35 are non-native species, resulting in a native to non-native ratio of 5.5:1. Using a simple calculation of $(\text{mean cc})(\sqrt{n})$ (where cc = coefficient of conservatism and n = number of native species) The Floristic Quality Index generated by our inventory for the preserve is 57.7. The Michigan DNR has proposed that an FQI of 35 indicates the parcel is of statewide importance, while sites with an FQI over 50 are considered “extremely rare and represent a significant component of Michigan’s native biodiversity and natural landscapes” (Herman, et al. 1996). It is remarkable that the FQI generated for Minnie Skwarek is so high, particularly considering the preserve is quite small at only 24 acres.

Habitat Description

Part of the reason for this high FQI is because while small, the Minnie Skwarek Nature Preserve is home to a diversity of habitats, which in turn support a wide diversity of plant species. Three main habitats were well represented: dry prairie/barrens, shaded wetlands, and mesic forest. The dry prairie/barrens was typified by young Oaks (*Quercus spp.*), Broomsedge (*Andropogon virginicus*), Poverty oat-grass (*Danthonia spicata*), and Old-field goldenrod (*Solidago nemoralis*). The shaded wetlands were characterized by Lizard’s tail (*Saururus cernuus*), Buttonbush (*Cephalanthus occidentalis*), young willows (*Salix spp.*), and Speckled alder (*Alnus rugosa*). The woodlands were dominated by American beech (*Fagus grandifolia*), Red maple (*Acer rubrum*), Yellow birch (*Betula alleghaniensis*), White oak (*Quercus alba*), Sassafras (*Sassafras albidum*), White pine (*Pinus strobus*), American hornbeam (*Carpinus caroliniana*) and Eastern hemlock (*Tsuga canadensis*).

Notable species

An unusual plant, Lizard’s tail (*Saururus cernuus*, cc=9), had not been tallied on the preliminary species list, but we found it to be abundant in the wetland areas. Two parasitic plants (each with a cc = 10), Beech drops (*Epifagus virginiana*) and Squawroot (*Conopholus americana*) were relatively common in the woodland locations. Beech drops is parasitic on

American beech (*Fagus grandifolia*) and Squawroot is parasitic on oaks (*Quercus* spp.). Owing to their lack of green tissue, these plants are easily overlooked by the untrained eye.

Of the 35 species of non-native plants identified, several are problematically invasive. The most worrisome plants are Multiflora rose (*Rosa multiflora*), Purple loosestrife (*Lythrum salicaria*), Autumn olive (*Elaeagnus umbellata*), Garlic mustard (*Alliaria petiolata*), Smooth brome (*Bromus inermis*), and Spotted knapweed (*Centaurea maculosa*). While none of these invasive plants are currently out of control they should continue be monitored and actively removed if possible.

Conclusions

This project proved to be a valuable tool for teaching students how a botanical inventory can be used to assess the conservation value of a parcel of land. It also gave students ample opportunity to hone their skills for using botanical keys. We want to qualify this work by emphasizing that the list was compiled in the autumn. At this time of year many herbaceous species in particular were either unrecognizable or simply not present. Therefore, this list should be understood to be incomplete and would be greatly enhanced by adding a spring or early summer inventory.

In addition, while conducted by students, the work was overseen by professor David Warners and we only included plants on the list that we had confidently identified. Again, this should be considered a preliminary effort that will become increasingly complete with subsequent botanical field work.

Given the limitations of season and botanical experience, it is significant that this effort resulted in an FQI of 57.7. This work, albeit incomplete, has identified the high conservation value of Minnie Skwarek Preserve, and underscores the importance of ongoing management efforts to insure that its biological integrity be protected in perpetuity.

Literature Cited and Field Guides Used

- Barnes, B. V. and W. H. Wagner, Jr. 2004. Michigan Trees, A Guide to the Trees of the Great Lakes Region, Revised and Updated. University of Michigan Press, Ann Arbor, MI. 447 pp.
- Herman, K. D., L. A. Masters, M. R. Penskar, A. A. Reznicek, G. S. Wilhelm, and W. W. Brodowicz. 1996. Floristic quality assessment with wetland categories and computer application programs for the State of Michigan. Michigan Department of Natural Resources, Wildlife Division, Natural Heritage Program. Lansing, MI. 21 pp. + Appendices.
- Voss, E. G. 1972. Michigan Flora Part I. Gymnosperms and Monocots. Cranbrook Institute of Science and University of Michigan Herbarium, Bloomfield Hills, MI. 488 pp.
- Voss, E. G. 1985. Michigan Flora Part II. Dicots (Saururaceae – Cornaceae). Cranbrook Institute of Science Bulletin 59 and University of Michigan Herbarium, Bloomfield Hills, MI. 727 pp.
- Voss, E. G. 1996. Michigan Flora Part III. Dicots (Pyrolaceae – Compositae). Cranbrook Institute of Science Bulletin 61 and University of Michigan Herbarium, Bloomfield Hills, MI. 622 pp.