

An Ecological Assessment of the Asylum Lake Preserve



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Submitted to the Asylum Lake Policy and Management Council
August 5, 2009



EXECUTIVE SUMMARY

Numerous biological surveys have been conducted at the 250 acre Asylum Lake Preserve on the western edge of the City of Kalamazoo, MI since Western Michigan University acquired the property more than 30 years ago. This study was not an attempt to duplicate past efforts. Now managed under the guidance of the Asylum Lake Policy and Management Council, our aim was to build upon prior work and provide a cohesive vision for the prudent management of the Preserve's natural features.

Records of previous observations helped to direct our surveys toward important natural features, and included the work of many faculty and students of WMU and other institutions. This report provides a strong basis for future research and educational endeavors. As the biodiversity of the Preserve is managed with increasing intensity, baseline data collected during this study will be a valuable tool for researchers in assessing the impacts of that management.

The study was divided into three focal areas: 1) a qualitative assessment of the natural features in the terrestrial habitats at the Preserve, including the compilation of historical records, 2) the establishment of long term vegetation monitoring plots and transects and initial data collection, and 3) a GIS-based assessment of invasive plant species at the Preserve.

The qualitative assessment focused on vascular plants and birds, as they are easily censused organisms and meaningful indicators of habitat quality. We documented a total of 455 plant species, from our observations and collections as well as from historical collections. From that list, more than 70% are native species, and 119 are newly reported from the Preserve. Perhaps the most interesting species are those that are typically found in Midwestern oak savannas, the habitat that was dominated the Kalamazoo area but is now largely destroyed. The wetlands also contain an impressive diversity of native species. Following a list compiled by the Kalamazoo Nature Center for their 2002 report on the natural features of the Preserve, we summarize observations of 117 bird species from 1976-2009. This compiled list incorporates the results of our 22 surveys between April 2008 and April 2009 and includes two new species, Henslow's Sparrow and Pine Warbler. Increases in some grassland bird species provide encouraging signs.

The Preserve supports four major habitat types or associations: oak-hickory forest or woodland, sedge meadow and shrub-carr, oldfields and associated upland shrub thickets, and a prairie and savanna reconstruction. Data was collected in survey areas delineated along the boundaries between these habitat types and generally following the management areas adopted by the Council. A vegetation monitoring protocol was initiated in all habitats, utilizing a 100 X 100 meter grid laid out over the property. Recommendations on the management of these habitats are included in the report, and are based on both anecdotal observations and the results of the vegetation monitoring.

The dominant tree species in the forests is wild black cherry, although white and black oak are prominent in the canopy, and red oak and pignut hickory are also common. The largest and presumably oldest trees are white oak, which was the historical dominant in many Midwestern oak savannas. The shrub layer is dominated by gray dogwood, a native species, and the non-native invasive shrub, glossy buckthorn. Collectively, the invasive shrubs glossy and common buckthorn and bush honeysuckle dominate, occupying almost 60% of the forest understory. The herbaceous

layer is generally species-poor, dominated by weedy natives such as Virginia creeper and the invasive herb garlic mustard. Small pockets of conservative species persist, supporting savanna species such as Culver's root, northern bedstraw, alum root, and showy goldenrod.

The wetlands are also largely degraded, impacted by stormwater runoff from the surrounding watershed. Extensive infestations of the invasive common reed, narrow-leaved cattail, purple loosestrife, and reed canary grass are a testament to this effect. As in the forests, however, pockets of native species diversity can be found. These areas are dominated by tussock sedge and support conservative species such as bog buckbean, marsh St.-John's wort, and many native sedges and grasses.

The prairie and savanna reconstruction have established inconsistently, and would benefit in areas from eradication of invasive species and re-planting with a diverse mixture of native prairie species, ideally of local or regional genotypes. The native prairie grass big bluestem is dominant some portions of the prairie and savanna, and the western one-third of the prairie in particular is composed of an even distribution of native prairie species. Much of the reconstruction, however, is overrun with red clover, quackgrass, and smooth brome, all of which are problematic species in prairie reconstructions.

Prescribed fire will be a useful tool in restoring native habitat in all portions of the Preserve, by encouraging site-appropriate native species that evolved with fire, and by discouraging invasive species. Controlling invasive plant species will be most resource-intensive tool for restoring native habitats at the Preserve. Considering the extent of many invasive species, it will be the most beneficial. Invasive species populations were assessed in three ways. They were prioritized in the vegetation monitoring protocol. Select invasive species were mapped with a Global Positioning System. Finally, the cover of invasive species was estimated in the forested areas of the Preserve, utilizing the 100 X 100 meter grid. Bush honeysuckle, glossy and common buckthorn, multiflora rose, garlic mustard, cattails, and common reed were identified as the most problematic invaders, requiring immediate control.

Tables are placed within the text where appropriate. Otherwise all tables and figures are included in Appendix A. Appendix B is comprised of a compiled plant list, bird list, and results of the vegetation monitoring. Finally, Appendix C provides reference information and recommendations for the management of the Preserve's natural features, including brief descriptions of all natural communities, protocols for monitoring vegetation and managing invasive species, and management recommendations by habitat. Nine maps are also included to illustrate observations made throughout the report.

Overall, the natural features of the Asylum Lake Preserve are highly degraded through many years of human occupation and the effects of urbanization. Small pockets of valuable habitat persist, and opportunities for the restoration and related research of these habitats abound.