# Table of Contents

**Introduction** ........................................... 1  
Natural History ........................................... 1  
Anthropogenic History ................................. 2  

**Materials and Methods** .......................... 4  
Qualitative Assessment ................................ 4  
Historical Data ........................................ 4  
Floristic Surveys ....................................... 4  
Avian Surveys ........................................... 5  
Photo-Monitoring ....................................... 5  
Long-term Vegetation Monitoring ............. 6  
The Grid (Plot Selection) .......................... 6  
Forest I & II: Modified-Whittaker Plots ...... 6  
Prairie, Savanna I & II: Prairie Transects .... 7  
Wet Meadow, Marsh: Wetland Transects ....... 7  
Pooled Data ............................................ 8  
Invasive Plant Species Monitoring .......... 9  
GPS Mapping .......................................... 9  
Forested Grids ....................................... 10  

**Results** .............................................. 11  
Qualitative Assessment ............................... 11  
Floristic Surveys ..................................... 11  
Avian Surveys ......................................... 13  
Other Animals ......................................... 16  
Vegetation Monitoring ............................... 17  
Forest I & II ........................................... 17  
Prairie, Savanna I & II ............................. 18  
Wet Meadow and Marsh ............................. 20  
Pooled Data .......................................... 20  
Invasive Plant Species Monitoring .......... 21  
GPS Mapping .......................................... 21  
Forested Grids ....................................... 21  

**Discussion** .......................................... 22  
Qualitative Assessment ............................... 22  
Plants .................................................. 22  
Birds ................................................... 24  
Natural Communities ................................. 26  
Oak Systems .......................................... 26  
Wetlands ............................................... 31  
Prairie/Savanna Reconstruction ............... 32  

**Acknowledgements** .............................. 33  

**Literature Cited** .................................. 34
TABLES AND FIGURES

Table 1. Prairie and savanna plant species from Asylum Lake Preserve and nearby locations: historical Genesee Prairie, Parkview Hills, and Fruit Belt Railroad ........................................... App A
Table 2. Invasive plant species at Asylum Lake Preserve and habitats they occupy ........................................... Page 9
Table 3. Excluded plant species and new reports ........................................... App A
Table 4. Proportion of plant species: native vs. adventive, planted, ecologically invasive ........................................... Page 11
Table 5. Floristic Quality Indices (FQI), mean coefficients of conservatism (C) and proportion of native species by survey area, including summaries of acres by habitat ........................................... Page 11
Table 6. Bird species observed at Asylum Lake Preserve, April 2008-April 2009 ........................................... App A
Table 7. Most common bird species by habitat ......................................................................................... App A
Table 8. Confirmed, probable, and possible breeding birds ........................................................................ App A
Table 9. The 15 most abundant bird species during the 2008 breeding season ........................................... Page 14
Table 10. Relative importance value for trees > 10 cm DBH, and tree functional group ........................................... Page 16
Table 11. Demographic distribution of woody stems from modified-Whittaker plots ........................................... App A
Table 12. Abundance and statistical summary for Forest I & II ........................................................................ App A
Table 13. Abundance and statistical summary for Prairie, Savanna I & II ........................................... App A
Table 14a. Summary of physiognomy, mean coefficient of conservatism (C), and floristic quality indices (FQI) for prairie transects ........................................... Page 18
Table 14b. Dominant and co-dominant plant species by prairie management unit ........................................... Page 19
Table 15. Abundance and statistical summary for Marsh and Wet Meadow ........................................... App A
Table 16a. Summary of physiognomy, mean coefficient of conservatism (C), and floristic quality indices (FQI) for wetland transects ........................................... Page 19
Table 16b. Dominant and co-dominant plant species for wetland transects ........................................... Page 20
Table 17. Summary of groundlayer data by plot and transect area ................................................................. App A
Table 18. Relative importance value and percent cover by grid for invasive plant species ........................................... App A
Table 19. Relative importance value and percent cover from modified-Whittaker plots for invasive plant species ........................................... App A
Table 20. Plant species originally sown by seed in Prairie & Savanna I, and species observed ........................................... App A
Table 21. Floristic quality indices and species richness from other survey sites ........................................... Page 23
Table 22. Percent cover of invasive plant species by grid number ................................................................. App A
Table 23. Recommendations for Prairie & Savanna I by Prairie Management Unit ........................................... App A
Table 24a. Area occupied by garlic mustard in GIS polygons, 2008 ................................................................. App A
Table 24b. Area occupied by select invasive species in GIS polygons, 2008 ....................................................... App A

Figure 1. Modified-Whittaker plot ...................................................... Page 6
Figure 2. Relative importance value for canopy tree species ................................................................. App A
Figure 3a. Demography of canopy tree species ...................................................... App A
Figure 3b. Demography of canopy tree species (excluding snags) ................................................................. App A
Figure 4a. Demography of understory woody species ...................................................... App A
Figure 4b. Demography of understory woody species (excluding stems 1-2.5 cm DBH) ...................................................... App A
Figure 5a. Jaccard similarity of survey areas, by percent cover of groundlayer species ...................................................... App A
Figure 5b. Jaccard similarity of plots and transects, by percent cover of groundlayer species ...................................................... App A
Figure 6. Relative importance value of invasive plant species in forested grids ...................................................... App A

Cover photo: Open-grown white oak (Quercus alba); Inset: Culver’s root (Veronicastrum virginicum)
MAPS

Map 1. Vegetation circa 1800, Kalamazoo County
Map 2. Survey Areas
Map 3. Plot and Transect Locations
Map 4. Prairie Management Units
Map 5. “Savanna Pockets”
Map 6. Garlic Mustard Populations
Map 7. Select Invasive Plant Species
Map 8. Percent Cover of Invasive Plant Species in Forest I & II, by Grid Square
Map 9. Sedge Meadow Patches and Groundwater Seeps

Aerial imagery courtesy of WMU Landscape Services; Non-original data layers: WMU Landscape Services, Michigan Department of Natural Resources (Vegetation Circa 1800). Maps 3 & 8, Cari DeLong, WMU Landscape Services; Map 6, C. DeLong and Tyler Bassett; all others T. Bassett.

APPENDICES

APPENDIX A: Tables and Figures

APPENDICES B: Comprehensive Lists
Appendix 1. Compiled list of vascular plant species observed at Asylum Lake Preserve, 1933-2008
Appendix 2. Compiled list of bird species observed at Asylum Lake Preserve, 1976-2009
Appendix 3. Complete statistical summary from groundlayer quadrats
(modified-Whittaker plots, prairie and wetland transects)
Modified-Whittaker Data Sheets
Prairie and Wetland Transect Data Sheets

APPENDICES C: Managing the Natural Communities of the Asylum Lake Preserve
Appendix 4. Natural Communities of the Asylum Lake Preserve
Appendix 5. Vegetation Monitoring Protocol
Appendix 6. Invasive Species Management Protocol
Appendix 7. Management Recommendations by Management Area