Aerial view of the Savanna 2 management unit from the asphalt drive.  
Parkview Ave. is to the right in this photograph.  
Kite photography courtesy of Jim Ratliff.

A. Management Goals for Management Unit – Oak Savanna 2

Goals for the Oak Savanna 2 management plan include improving the use of this property for passive recreation and educational purposes and the restoration/reconstruction of a native Michigan oak savanna. Studies, including the monitoring of flora and fauna, as the restoration/reconstruction of an oak savanna progresses will be encouraged. This management unit is unique in that the City of Kalamazoo has used a portion of the unit to compost leaves in the past. Two masters theses were completed by students in the Geoscience Department at WMU looking into the effects of the leaf piles on the ground water. Impacts to the groundwater were found in both studies, one in 1993 and the other in 2001. (Refer to Historic Description and Uses section of this document for details.) However, Drs. Hampton and Kehew of the Geosciences Dept. at WMU are both of the opinion that presently the leaf compost piles are benign and have little to no effect on the groundwater (email correspondence, February, 2006).

The goal of the restoration/reconstruction of this unit is to encourage a healthy native oak savanna habitat that contains diverse native flora and fauna. An oak savanna can be made up of a combination of oak savanna types including bur oak plains, oak openings, and/or oak barrens. Due to the soil type and surrounding vegetation this management unit will be more consistent with a bur oak plains or oak opening habitat and due to the recent planting of bur oaks in the nearby Oak Savanna 1, we will emphasize the former. The Michigan Natural Features Inventory (MNFI) describes bur oak plains as a formerly widespread savanna type having a 10 to 30% canopy. Bur oak plains occur on level to gently sloping plains and are often adjoining mesic prairie. The soils are made up of loam and sandy loam with a neutral pH and good water retaining capacity. The dominant plants include scattered, widely spaced bur oak with a few white and black oak. The ground-layer vegetation is similar to that of a mesic prairie. (Kost, 2007)

This management unit differs from the Oak Savanna 1 management unit in that restorative actions have not been taken, but is adjacent to the same habitats, namely mesic prairie and oak forest.
B. Overview of Management Unit – Oak Savanna 2

1. Landscape Context
   The Oak Savanna 2 management unit makes up 14.1 acres of the Asylum Lake Preserve lining the center southern edge. Parkview Avenue is its southern boundary with the prairie management unit to the west and Forest 1 management unit to the north and east. An entrance to the Preserve from Parkview Avenue is located on the southern edge of the management unit which connects to a former Kalamazoo State Hospital asphalt road running north through the unit. A fence with a locked gate and a small opening for pedestrians runs the length of the southern boundary. Just outside of the fence is a sidewalk maintained by WMU.

   The KNC Report (2001) describes the soil as Kalamazoo loam. Near the southern edge of the management unit land slopes range from 2-6%, however most of the unit contains slopes of 6-12%.

2. Description and Uses
   a. Historic Description and Uses

   Pre-Settlement Period (circa 1800)
   This management unit was described by the Kalamazoo Nature Center as a mixed oak savanna circa 1800. This mixed oak savanna probably was a combination of three Michigan natural community types as classified by the Michigan Natural Features Inventory (MNFI): bur oak plains, oak openings, and oak barrens. (Kost, 2007)

   Institutional Period (1887-1975)
   With the increased traffic on the property and added improvements, paved drives with gutters were constructed to remaining cottages that lacked vehicular access. All of these turn-of-the-century enhancements (i.e., sewage treatment, fresh water system, and improved roads) were made to improve “the appearance of the colony park” and the quality of life at Colony Farm (Report of the Board of Trustees, 1890).

   According to archeological evidence and written documents there is no evidence of activities such as farming or the raising of livestock taking place within this management unit. No buildings or other structures were constructed on this management unit during the time it was owned by the Kalamazoo State Hospital. (Becker & Nassaney, 2005)

   The paved road that still exists today (as of 2008) runs north through the middle of the property was constructed during the Institutional Period (1887-1975). It led through the forest back to a small parking lot between the heating plant to the west and Rich Cottage to the east.

   University Period (1975-2008)
   Unlike the Mesic Prairie and Oak Savanna 1 management units, this area has not been used for agricultural purposes, treated with pesticides or undergone prescribed burns. It has however, been used by the City of Kalamazoo as a leaf compost site. In 1990, the City of Kalamazoo collected leaves as part of a residential leaf pickup program. These leaves were dumped in rows on the west side of the paved road and on the southeast corner of the unit. In order to compost the leaves, they were turned and aerated by the city 2 to 3 times.
according to Paul MacNellis, WMU Physical Plant (personal correspondence in May 2006). According to WMU records there was approximately 1,000 cubic yards of leaf compost material located at this site. The leaf piles located on the southeast corner of this management unit were later sold as compost and removed by the City.

Two master’s theses were completed through the Geosciences Department at WMU on the water quality effects of the composting leaf piles. Results of a thesis completed in 1993 demonstrated that the leaf piles to the west of the paved drive were producing “…reducing, anoxic conditions in infiltrating water and increases in the dissolved concentration of metals such as iron.” (Allen, 1993) A more recent thesis completed in 2001 identified a plume in the groundwater characterized by increased levels of calcium, magnesium, iron, bicarbonate, sodium, chloride, sulfate, conductivity, and hydrogen with decreased levels of oxygen as a result of the leaf compost piles. This study also concluded that the plume had moved away from the leaf piles, which was attributed to decreasing composition rates of the leaf piles. (Steeves, 2001)

Since 1991, Geosciences has used this area for the purpose of teaching methods in drilling wells and water quality monitoring. This savanna 2 management unit is the site of the Geoscience Department well field 2. There are approximately 27 wells to the west of the paved road and 14 wells to the east. Out of these 41 wells, most of have been flush-mounted and 9 have been abandoned. The Geoscience Department Hydrogeology Field Course, held during the summers, utilizes the few remaining operational wells in this well field for groundwater sampling demonstrations. (Refer to Geoscience Dept. Structures at Asylum Lake Map)

The Kalamazoo Nature Center (KNC) was hired by WMU to inventory the flora and fauna of the Asylum Lake Preserve at intervals between the dates of September 1, 1999 and November 30, 2000. This management unit was described as containing mostly red clover, yarrow, spotted knapweed, gray goldenrod, white sweet-clover, black raspberry, English plantain, blackberry, poison-ivy, enchanter’s nightshade, and Virginia rose. There are also some autumn olive, tartarian honeysuckle, and glossy buckthorn along the edges. (For detailed lists, refer to the KNC Report, 2001)

Fauna in this management unit were also surveyed by the KNC. Observations included several species of butterflies, dragonflies and damselflies, along with rodents such as chipmunks, meadow voles, and mice. Among the bird species recorded were: eastern kingbird, black-capped chickadee, tufted titmouse, eastern blue bird, eastern towhee, indigo bunting, red-winged blackbird, gray catbird, and field sparrow. No amphibian species were recorded, and only one eastern box turtle was present. For detailed lists, refer to the KNC Report (2001).
b. Current Description and Uses
The most current data describing the flora and fauna of this management unit was that of the KNC Report (2001) (refer to summary under “Historic Description and Uses. University Period (1975-2008)” of this document). No recent surveys have been conducted. Baseline studies on the distribution of flora and fauna will be encouraged.

Geosciences Department, WMU uses the property occasionally for teaching/education purposes and well sampling. Geosciences well field 2 is on this management unit. While most of the wells have been flush mounted or abandoned, a few are still operational. The document, “An Archeological Assessment of Asylum Lake/Colony Farm Orchard property in Kalamazoo, Michigan”(Becker & Nassaney, 2005), listed the land included in this management unit as an area of low archeological sensitivity. The classification of low archeological sensitivity refers to the probability of this management area to contain significant archeological material is low. (Refer to Archeological Sensitivity Map)

An asphalt road, constructed by the Kalamazoo State Hospital, still runs north through the middle of this management unit. There are also a variety of man-made objects present, including several large culverts. The leaf piles are still visible to the west of the road. As part of the Asylum Lake Preserve, this management unit is open for public use such as walking, bird watching, skiing, running and other passive recreation. Landscape Services mows trails through the unit periodically throughout the spring, summer and fall.

C. Management Actions for Management Unit – Oak Savanna 2

1. Conservation and Management Objectives
   - Conduct baseline flora and fauna ecological studies before reconstruction/restoration efforts and implement a monitoring program in order to assess the progress of management practices.
   - Encourage a diverse natural community and the ecological processes that sustain it, including flora and fauna species native to Michigan, especially grassland birds and endangered, threatened, or species of special concern.
   - Improve trails, entryways and firebreaks conducive to the lowest impact to the natural features, while enhancing the educational and aesthetic experience for visitors.
   - Encourage the compatible use of this management unit for teaching, research and recreational purposes with that of wildlife restoration.
- Improve the educational experience for visitors and emphasize the appropriate use of the land.
- Implement necessary changes in keeping with ecologically sound practices in order to improve handicap access if studies demonstrate feasibility.

2. Problems
- Poor native floral and faunal species diversity.
  - According to the KNC Report (2001), the floristic quality index for this management unit had a poor rating of less than 19.
- Incompatible human use.
- Lack of handicap accessibility.

3. Possible Causes
- Invasive flora and fauna.
- Small overall habitat area.
- Large edge areas.
- The organization of trails, firebreaks and entryways.
- Nutrient depleted and/or contaminated soils.
- Lack of knowledge of Asylum Lake Preserve documentation and coordination for group visits and research projects.
- Visitor’s lack of understanding of the ecology of the land and the goals of the oak savanna restoration/reconstruction.
- Infrastructure on the property was not designed for handicap accessibility.
- Unleashed dogs.

4. Mitigation Strategies
- Introduce native Michigan genotype vegetation, as appropriate, to improve native species diversity.
- Introduce native Michigan fauna, as appropriate, to improve native species diversity.
- Control invasive vegetation and replace non-native vegetation with native species that provide appropriate food and cover sources for fauna, especially threatened, endangered or species of special concern.
- Enforce the use of leashes for dog walking.
- Control any sources of nutrient depletion and contamination of soils that may exist.
- Reduce edge areas.
- Design trails, entryways, and firebreaks to minimize the impact on the native flora and fauna while improving the educational and aesthetic experience of visitors.
- Implement changes to improve handicap accessibility if determined to be feasible and ecologically sound.
- Coordinate group visits and research activities with appropriate notices and approvals.
- Improve public perception and/or the public’s relationship with the property.
- Add interpretive signage explaining management activities and emphasizing appropriate use of the area.
- Encourage the integration of research and classroom activities with the restoration/reconstruction of a native Michigan oak savanna.

5. **Assessment (the following are possible actions that may be taken)**
   - Research and study possible remediation strategies for the leaf piles.
   - Conduct a baseline ecological study of floral and faunal diversity including relationships within the ecosystem in a quantitative manner to guide reconstruction/restoration efforts.
   - Monitor floral and faunal diversity at appropriate intervals.
   - Measure and monitor the soil, microflora and microfauna quality.
   - Monitor human use and ecological impacts at appropriate intervals.
   - Monitor handicap usage of the property.

6. **Measures of Success**
   - An increase of native floral diversity compared to baseline studies.
   - A decrease of non-native floral diversity compared to baseline studies.
   - An increase of native faunal diversity compared to baseline studies.
   - The reduction of incompatible human use compared to initial assessments.
   - An increase in handicap accessibility if studies determine actions are feasible and ecologically sound.