

Detroit Parks:

Plant Species Survey and Community Characterization



Prepared by Ellen Elliott Weatherbee and Brian J. Klatt, Ph.D.
Weatherbee's Botanical Surveys
11405 Patterson Lake Drive
Pinckney, Michigan

4 August, 2004

Prepared for the Friends of Belle Isle
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8 August 2004

Weatherbee's Botanical Surveys
11405 Patterson Lake Drive
Pinckney, Michigan 48169

Ms. Suzan Campbell
Great Lakes Commission
University of Michigan
2805 S. Industrial, Suite 100
Ann Arbor, MI 48104

Re: Friends of Belle Isle – Detroit Parks Survey

Dear Ms. Campbell:

Weatherbee's Botanical Surveys (Weatherbee's) is pleased to submit this report presenting our findings with regards to the floristic survey of Palmer, Balduck, and Pitcher Parks of the Detroit Parks and Recreation Department system.

As you can see from the report, Weatherbee's feels that the parks represent significant floristic resources on a state-wide basis in their own right, but especially so in light of their urban settings. The plant community at Balduck Park is particularly intriguing given its assemblage of oak species and consequent lack of match to descriptions in *Michigan Natural Plant Communities*. We would encourage you and the Friends of Belle Isle to continue your evaluation and monitoring of the parks, as we are sure even more plant species will be found over time in these intriguing systems.

It was very much a pleasure working with yourself and Ruth in the field and if we can be of further assistance to you in the future, or if you have any questions on the above, please feel free to contact either of the undersigned.

Sincerely,

Ellen Elliott Weatherbee
(734) 878-9178

Brian J. Klatt, Ph.D.
(517) 304-5878

DETROIT PARKS -- PLANT SPECIES SURVEY AND PLANT COMMUNITY CHARACTERIZATION

by

Ellen Elliott Weatherbee and Brian Klatt

4 August 2004

Weatherbee's Botanical Surveys (Weatherbee's) was contracted by the Friends of Belle Isle to perform a botanical reconnaissance of three parks within the Detroit Parks and Recreation system: Palmer, Balduck and Pitcher Parks. The intent of the reconnaissance was to begin development of a comprehensive list of all of the plant species found in the parks, as well as providing a professional opinion as to the types of plant communities present in the parks.

BACKGROUND

Geologically, these three parks are found on an ancient lake plain. Lake Maumee was the result of high water levels at the end of the last glaciation; about 10,000 years ago. This lake was formed as the glacier melted, and the waters spread over southeastern Michigan as far west as Ypsilanti. Gradually the waters receded to the present levels, leaving many wet pockets and a series of slightly higher and drier, often sandy, slightly-elevated areas that were former beaches. The area that was left was a wet, relatively flat plain, with few rivers large enough to drain the surrounding land. In order to drain the swampy land after man began to colonize the area, an intricate series of drainage ditches was dug, starting in about 1850, in order to dry out the land before fill was deposited for building sites.

Although surrounded by urban areas, even to the untrained observer, these parks show an impressive quality and quantity of plant species. While there are exotics present in each park, but they tend to be clustered around the edges and along paths, leaving plenty of room for a healthy array of native shrubs and herbaceous plants under the canopy of native trees. The moist to wet conditions in the three parks may have been instrumental in their saving. High and dry areas tend to be developed first, as there is expense and time that go into filling wet areas. Since the parks tend to have high water tables, they have been somewhat sheltered from the drying out of the water table that usually occurs in urban areas. Palmer Park was part of a large estate, whose log building is still found on the site in a more developed (i.e. park-like with grass) area of the park, away from the heavily forested area.

Since so little is left of the natural vegetation of the Detroit area, especially in large tracks, these three parks remain as some of the last outposts of what used to be vast tracts of forest that grew on the fertile lake bottom. These parks are, in a sense, living museums, but they are considerably more than that, as there are ongoing interactions between recruitment of young seedlings, the survival of a handful of rare individuals, the changing composition of the canopy, and the mixture of trees, shrubs, and herbaceous plants in a "survival of the fittest" attempt to adapt to the surrounding urban environment.

These relict areas can only give a peek at what was formerly in the area, as these areas have continued to be influenced by climate warming, by changes in the water table due to the filling in of much of the surrounding wetlands, and by the influx of different plants via seeds, especially the weedy plants that are transported by birds from neighboring landscape plantings (squirrels and rodents can scatter nuts and seeds for short distances, birds can fly for long distances with seeds in their stomachs or caught in their feathers). Unlike forests that have adjoining forests for neighbors or streams or rivers winding through them to disperse a variety of plants to them, these three isolated forests are left with what they had when first surrounded by urbanization, with the exception of what the squirrels, rodents, and birds can supply them with nuts and seeds.

METHODS

Palmer Park, Pitcher Park, and Balduck Park, in the Detroit Parks and Recreation System, were examined between the fall of 2003 and the spring of 2004. This time frame was used to cover the entire growing season, in order to include plants that are identifiable in specific times of the year. People who actively took part in the survey are Ellen Elliott Weatherbee, Brian J. Klatt, Suzan Campbell, Ruth Hart, and Andy Hartz.

Plant communities are variously referred to as habitats, areas, types, and societies; they are described by their most commonly occurring plants. In the case of these three parks, the dominant plants are the large trees in the overstory (also called canopy). Also present is the understory, consisting of shrubs and herbaceous plants. The three layers of vegetation depend on the soil type, the amount of available water, what time of year the water is available, climate, what tree species have had commercial value and were heavily harvested (timbered), and the number of openings in the forest. Trees, shrubs, and herbaceous plants tend to grow in close associations; once the tree species are known, for example, the accompanying shrub and herbaceous species can be predicted fairly confidently.

Reference is frequently made throughout this survey to the classification system of *Michigan Natural Plant Communities* (Chapman 1986), published by the Michigan Natural Features Inventory (MNFI) of Wildlife Division, Department of Natural Resources (DNR). Also helpful for information about tree species and habitats is *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Complete lists of the plant species found in each park are presented in the appendices. Each plant is listed by genus, species, common name, wetland indicator, and qualitative assessment rating (*Floristic Quality Assessment*, published by the DNR, 1996).

According to the *Floristic Quality Assessment*, wetland indicators show OBL (Obligate Wetland) for plants which almost always occur in wetlands under natural conditions (more than 99% probability); FACW (Facultative Wetland) for plants which usually occur in wetlands, but occasionally are found in non-wetlands (67% - 99% probability); FAC (Facultative) for those plants equally likely to occur in wetlands or non wetlands

(34% - 66% probability); FACU (Facultative Upland) for those plants which occasionally occur in wetlands, but usually occur in non-wetlands (estimated 1% - 33% probability); and UPL (Upland) for plants which almost never occur in wetlands under natural conditions (less than 1% probability).

The numerical ratings, also taken from the *Floristic Quality Assessment*, show a value for each plant which is assigned a coefficient of conservatism ranging from 0 - 10 and which represents “an estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be a presettlement condition.” In other words, plants with a low numerical rating can be found in a wide range of habitats, while those with a high number are “almost always restricted to a presettlement remnant, *i.e.* a high quality natural area.” Plants marked with an asterisk (*) are not native to Michigan. From the individual coefficients of conservatism for each species, a Floristic Quality Index (FQI) can be calculated for each park. In essence, the FQI is the mean coefficient of conservatism for the species, divided by the number of species entering the calculation. The FQI of a given plant community conveys a sense of how representative the vegetation is relative to presettlement conditions. To interpret FQIs, the MDNR provides the following specific guidance. *“Most of the remaining undeveloped land registers floristic quality indices (FQI) of less than 20 and has minimal significance from a natural quality perspective. Areas with a FQI higher than 35 possess sufficient conservatism and richness that they are floristically important from a statewide perspective. Areas registering in the 50s and higher are extremely rare and represent a significant component of Michigan’s native biodiversity and natural landscapes.”*

FINDINGS

Since these parks are heavily used for active and passive recreation, including hiking, running, and dog walking, there is the usual litter to be expected along the trails and in the woods—debris includes old bottles, abandoned cars, diapers, and shingles; sometimes these items are found in huge piles, and other times in single items casually tossed aside. However, this obvious debris should not deter the interested person in the search for interesting plants and habitats.

Palmer Park

Palmer Park is large and contains many different habitats. The area contains both former lake-bed and former beach ridges of glacial Lake Maumee. Much of it is wet throughout the year, especially on the former lake-bed, where most of the wetland plants are found. Upland plants tend to be found on the drier, often sandy, ridges that range from several feet to about 20' high and run in several bands across the site.

Sassafras is usually found in Dry-mesic Southern Forest on sandy glacial lake plains and is here found on the slightly elevated sandy former beach ridges. The black-gum and pin oak are frequent on sandy glacial lake plains. There is a record of an unusual blazing star (*Liatris squarrosa*) from the park in 1904. The presence of that species indicates there might have been a prairie in the area at that time. It may have evolved to an oak savanna and then to the present forested area. Allegations that birch grew in the park appear to be unfounded. There is a specimen of white birch from Palmer Park, collected in 1913, that

is in the Herbarium of the University of Michigan, but the specimen is marked “Cult?” That comment means that the origin of the birch as a naturally-occurring specimen is in doubt, and it probably came from a cultivated birch.

The Floristic Quality Index (FQI) for Palmer Park is 35.35 including exotics and 39.98 for natives only. A total of 140 total species were found, with 109 species being native. Community types found were Southern Swamp, Mesic Southern Forest, and Dry-mesic Southern Forest.

Pitcher Park

Pitcher Park is a fairly small park adjacent to a school. Its dominant trees show that it contains elements of hardwood swamp, an oak/hickory forest, and beech-maple forest. Sassafras and tulip-trees are also found here—these are often found in Dry southern Forests (Oak Forests).

The Floristic Quality Index (FQI) for Pitcher Park is 28.12 including exotics and 30.48 for natives only. A total of 68 species were found, with 58 being native. Community types found are Southern Swamp, Mesic Southern Forest, and Dry-mesic Southern Forest.

Balduck Park

Balduck Park is fairly small and is surrounded by a residential area and open parkland. The trees show an interesting mix and include at least five species of oak, including Shumard oak, a relatively new find in Michigan, although it has been known from neighboring Ontario. Shumard oak is a plant rated as Special Concern, due to the limited number of sites where it is found in Michigan.

Michigan Trees (Barnes and Wagner) places this oak in the Deciduous Swamp Community, which is described as, “Occurring mainly in southern Michigan, the habitat is wet and cool. Water tables are high, they fluctuate only slightly, and water and nutrients are available to tree roots throughout the year—although oxygen, required for root respiration, is lacking. Soil drainage is poor to very poor.” Barnes cites other tree associates as being silver maple, eastern cottonwood, pin oak, swamp white oak, pumpkin and red ashes, shellbark and shagbark hickories, American elm, and *Crataegus* spp. (hawthorns). All but the pumpkin ash and the shellbark hickory are found on the Balduck site.

Weatherbee’s is in agreement with Ms. Suzan Campbell that the existing list of Michigan Natural Community Types is not adequate for addressing Balduck Park. Consequently, we have developed a new community description for Wetland Oak Forest, following the format of MNFI descriptions; it is presented in detail in Appendix A-3.

The Floristic Quality Index (FQI) for Balduck Park is 22.15 including exotics and 23.36 excluding exotics. There were 37 total species found, 33 of which are native.

APPENDIX A-1: PALMER PARK

Brian Klatt, Ellen Elliott Weatherbee, Suzan Campbell, and Ruth Hart
Fall, 2003 and Spring, 2004

Palmer Park is large and contains many different habitats. The area contains both former lake-bed and former beach ridges of glacial Lake Maumee. Much of it is wet throughout the year, especially on the former lake-bed, where most of the wetland plants are found. Upland plants seek out the drier, often sandy, ridges that range from several feet to about 20' high and run in several bands across the site.

Sassafras is usually found in Dry-mesic Southern Forest on sandy glacial lake plains and is here found on the slightly elevated sandy former beach ridges. The black-gum and pin oak are frequent on sandy glacial lake plains. There is a record of an unusual blazing star (*Liatris squarrosa*) from the park in 1904. The presence of that species indicates there might have been a prairie in the area at that time. It may have evolved to an oak savanna and then to the present forested area.

There is a specimen of white birch from Palmer Park, collected in 1913, that is in the Herbarium of the University of Michigan, but the specimen is marked "Cult?" That comment means that the origin of the birch as a occurring naturally specimen is in doubt,

Unless noted otherwise, quotes below are from the *Michigan Natural Community Types*.

The Floristic Quality Index (FQI) for Palmer Park is 35.35 including exotics and 39.98 for natives only. A total of 140 total species were found, with 109 species being native. Community types found are Southern Swamp, Mesic Southern Forest, and Dry-mesic Southern Forest.

1. Southern Swamp (wetter, flatter areas of the park)

Overview: A wetland deciduous forest type, located south of the transition zone.

Physiography and geology: Situated on glacial lake plains (and other areas outside of the former Lake Maumee basin).

Soils: Loam and silt loam soil (sometimes sandy loam) often possesses a clay layer; pH is neutral to slightly acid (in sandier soils).

Dominant plants: Red and silver maple, red ash, and American elm. Also dominant in Palmer Park in some areas is pin oak. There was one medium-sized black-gum found near areas of pin oak and sassafras "both of which are found principally on glacial lake plains."

Associated species: Native shrubs include gray dogwood, spiceberry, and winterberry. Herbaceous plants include jack-in-the-pulpit, poison ivy, and side-flowering aster, smartweeds, and touch-me-not,

Weedy exotics: White mulberry is a weedy tree. Weedy shrubs include glossy buckthorn and European highbush cranberry. Among the weedy herbaceous plants is poison ivy.

Similar communities: Barnes, in *Michigan Trees*, places most of these plants in the Deciduous Swamp Community. The closed forest type listed in *Michigan Natural Community Types* is Southern Swamp.

Natural processes: These sites are frequently ponded from spring into early summer, resulting in sparse a sparse ground cover, except on slightly higher microsites. Shumard oak also tends to thrive on these higher microsites.

Literature: *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Michigan Natural Plant Community Types. It is available from the Michigan Natural Features Inventory, Lansing, MI

Forest B.H. Brown, *Forest Associations of Wayne County, Michigan* in Michigan Academy of Science, Nineteenth Report, describes“(The) last great forest association” is a highly mixed one occurring on rather shallow sand and characterized by sassafras. The tree is associated with two others which are not quite so abundant or so uniformly distributed throughout the area, namely: *Quercus palustris* and *Nyssa sylvatica*...and these three are the most characteristic species of this highly complex association. ...The sassafras association is by far the most mixed association in the county.”

2. Mesic Southern Forest (drier, sandy areas of the park)

Overview: “A southern hardwood forest type on moist ground with little oak.”

Physiography and geology: Situated on glacial lake plains (and other areas outside of the former Lake Maumee basin).

Soils: “Variable, with a predominance of clay to loam texture.”

Dominant plants: sugar maple, beech, red oak, and tulip-tree

Associated species: Native shrubs include alternate-leaved and flowering dogwoods, smooth shadbush, redbud, and witch hazel. Herbaceous plants include richweed, wild geranium, and wintergreen.

Weedy exotics: Some of the weedy trees are Norway maple and tree-of-heaven. Native shrubs include buckthorn, common barberry, European highbush cranberry, several honeysuckles, and jetbead. Among the weedy herbaceous plants are barnyard grass, bittersweet nightshade, heal-all, motherwort, and Queen Anne’s lace.

Similar communities: Dry-mesic Southern Forest

Natural processes: “A natural preponderance of beech could possibly signify a longer time in mature forest conditions, but it could also be the result of heavy selective cutting of sugar maple or of moderately poor drainage conditions for which beech has better tolerance.”

Literature: *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Michigan Natural Plant Community Types. It is available from the Michigan Natural Features Inventory, Lansing, MI

3. Dry-mesic Southern Forest (driest areas of the park)

Overview: “A n oak or oak-hardwood forest type on generally dry-mesic sites....”

Physiography and geology: “Occurring on sandy glacial lake plains (and other areas)....”

Soils: “Sandy loam and loam soils are slightly acid to neutral.”

Dominant plants: white ash, wild black cherry, shag-bark hickory, red maple, black, red, and white oak, and sassafras. Shrubs are bristly green-briar, ironwood and witch-hazel.

Weedy exotics: Some of the weedy trees are Norway maple and tree-of-heaven. Native shrubs include buckthorn, common barberry, European highbush cranberry, several honeysuckles, and jetbead. Among the weedy herbaceous plants are barnyard grass, bittersweet nightshade, heal-all, motherwort, and Queen Anne’s lace.

Similar communities: Mesic Southern Forest

Natural processes: “Present Dry-Mesic Southern Forests were probably Oak Openings prior to fire suppression....”

Literature: *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Michigan Natural Plant Community Types. It is available from the Michigan Natural Features Inventory, Lansing, MI

Palmer Park Botanical Survey Results

| <u>Scientific name</u> | <u>Common name</u> | <u>Wetland category</u> | <u>Coefficient of Conservatism</u> |
|----------------------------------|-----------------------------|-------------------------|------------------------------------|
| <i>Acalypha rhomboidea</i> | Mercury, three-seeded | FACU | |
| 0 | | | |
| <i>Acer negundo</i> | Box-elder | FACW- | 0 |
| <i>Acer platanoides</i> | Maple, Norway | UPL | * |
| <i>Acer rubrum</i> | Maple, red | FAC | 1 |
| <i>Acer saccharinum</i> | Maple, silver | FACW | 2 |
| <i>Acer saccharum</i> | Maple, sugar | FACU | 5 |
| <i>Actaea rubra</i> | Baneberry, red | UPL | 7 |
| <i>Aesculus glabra</i> | Buckeye, Ohio | FAC+ | |
| 6 | | | |
| <i>Agrimonia gryposepala</i> | Agrimony, tall | FACU+ | 2 |
| <i>Ailanthus altissima</i> | Tree-of-heaven | UPL | * |
| <i>Alliaria petiolata</i> | Garlic-mustard | FAC | |
| * | | | |
| <i>Ambrosia artemisiifolia</i> | Ragweed, common | FACU | * |
| <i>Amelanchier laevis</i> | Shadbush, smooth | UPL | 4 |
| <i>Apocynum androsaemifolium</i> | Dogbane, spreading | UPL | 3 |
| <i>Arctium minus</i> | Burdock, common | UPL | * |
| <i>Arisaema triphyllum</i> | Jack-in-the-pulpit, swamp | FACW- | 5 |
| <i>Asclepias syriaca</i> | Milkweed, common | UPL | 1 |
| <i>Aster lateriflorus</i> | Aster, side-flowering | FACW- | 2 |
| <i>Aster pilosus</i> | Aster, hairy; Frost's aster | FACU+ | 1 |
| <i>Aster sagittifolius</i> | Aster, arrow-leaved | UPL | 2 |
| <i>Barbarea vulgaris</i> | Yellow-rocket | FAC | * |
| <i>Bromus inermis</i> | Brome, Hungarian | UPL | * |
| <i>Carex blanda</i> | Sedge | FAC | 1 |
| <i>Carex gracilescens</i> | Sedge | UPL | 5 |
| <i>Carex pensylvanica</i> | Sedge | UPL | 4 |
| <i>Carex rosea</i> | Sedge, wood | UPL | 2 |
| <i>Carpinus caroliniana</i> | Hornbeam | FAC | 6 |
| <i>Carya glabra</i> | Hickory, pignut | FACU | 5 |
| <i>Carya ovata</i> | Hickory, shagbark | FACU | 3 |
| <i>Celtis occidentalis</i> | Hackberry | FAC- | 5 |
| <i>Cercis canadensis</i> | Redbud | FACU | 8 |
| <i>Chenopodium hybridum</i> | Goose-foot, maple-leaved | UPL | 1 |
| <i>Circaea lutetiana</i> | Enchanter's-nightshade | FACU | 2 |
| <i>Cirsium vulgare</i> | Bull-thistle | FACU- | |
| * | | | |
| <i>Collinsonia canadensis</i> | Richweed; stoneroot | FAC | 8 |
| <i>Convallaria majalis</i> | Lily-of-the-valley | UPL | * |
| <i>Cornus alternifolia</i> | Dogwood, alternate-leaved | UPL | 5 |
| <i>Cornus florida</i> | Dogwood, flowering | FACU- | 8 |
| <i>Cornus foemina</i> | Dogwood, gray | FACW- | 1 |

| Scientific name | Common name | Wetland category | Coefficient of Conservatism |
|-------------------------------------|--------------------------|------------------|-----------------------------|
| <i>Cornus stolonifera</i> | Dogwood, red-osier | FACW | 2 |
| <i>Crataegus crus-galli</i> | Thorn, cockspur | FAC | 5 |
| <i>Crataegus sp.</i> | Hawthorn | UPL | 5 |
| <i>Dactylis glomerata</i> | Orchard-grass | FACU | * |
| <i>Daucus carota</i> | Queen-Anne's-Lace | UPL | * |
| <i>Diervilla lonicera</i> | Bush-honeysuckle | UPL | 4 |
| <i>Echinochloa crusgalli</i> | Barnyard-grass | FACW | * |
| <i>Elymus virginicus</i> | Rye, Virginia wild | FACW- | 4 |
| <i>Erythronium americanum</i> | Trout lily, yellow | UPL | 5 |
| <i>Euonymus obovata</i> | Strawberry-bush, running | UPL | 5 |
| <i>Eupatorium rugosum</i> | Snakeroot, white | FACU | 4 |
| <i>Fagus grandifolia</i> | Beech, American | FACU | 6 |
| <i>Fraxinus americana</i> | Ash, white | FACU | 5 |
| <i>Fraxinus pennsylvanica</i> | Ash, green | FACW | 2 |
| <i>Gaultheria procumbens</i> | Wintergreen | FACU | 5 |
| <i>Geranium maculatum</i> | Geranium, wild | FACU | 4 |
| <i>Geum canadense</i> | Avens, white | FAC | 1 |
| <i>Glyceria striata</i> | Manna-grass, floating | OBL | 4 |
| <i>Hackelia virginiana</i> | Stickseed | FAC- | 1 |
| <i>Hamamelis virginiana</i> | Witch-hazel | FACU | 5 |
| <i>Helianthus tuberosus</i> | Jerusalem-artichoke | FAC | 6 |
| <i>Hemerocallis fulva</i> | Day-lily, orange | UPL | * |
| <i>Hystrix patula</i> | Bottlebrush-grass | UPL | 5 |
| <i>Ilex verticillata</i> | Winterberry | FACW+ | |
| 5 | | | |
| <i>Impatiens capensis</i> | Touch-me-not, spotted | FACW | 2 |
| <i>Juglans nigra</i> | Walnut, black | FACU | 5 |
| <i>Leonurus cardiaca</i> | Motherwort | UPL | * |
| <i>Lindera benzoin</i> | Spicebush | FACW- | 7 |
| <i>Liriodendron tulipifera</i> | Tulip-tree | FACU+ | 9 |
| <i>Lobularia maritima</i> | Alyssum, sweet | UPL | * |
| <i>Lonicera maackii</i> | Honeysuckle, amur | UPL | * |
| <i>Lonicera tatarica</i> | Honeysuckle, Tartarian | FACU | * |
| <i>Lysimachia nummularia</i> | Moneywort | FACW+ | * |
| <i>Maianthemum canadense</i> | Canada-Mayflower | FAC | 4 |
| <i>Morus alba</i> | Mulberry, white | FAC | * |
| <i>Nepeta cataria</i> | Catnip | FAC- | * |
| <i>Nyssa sylvatica</i> | Black-gum | FACW+ | 9 |
| <i>Oenothera biennis</i> | Evening-primrose, common | FACU | 2 |
| <i>Onoclea sensibilis</i> | Fern, sensitive | FACW | 2 |
| <i>Osmunda regalis</i> | Royal-fern | OBL | 5 |
| <i>Ostrya virginiana</i> | Ironwood | FACU- | |
| 5 | | | |
| <i>Oxalis fontana (O. europaea)</i> | Wood-sorrel, yellow | FACU | 0 |
| <i>Parthenocissus quinquefolia</i> | Virginia-creeper | FAC- | 5 |

| Scientific name | Common name | Wetland category | Coefficient of Conservatism |
|------------------------------------|------------------------------|------------------|-----------------------------|
| <i>Phalaris arundinacea</i> | Grass, reed canary | FACW+ | 0 |
| <i>Phragmites australis</i> | Giant-bulrush | FACW+ | 1 |
| <i>Phytolacca americana</i> | Pokeweed | FAC- | 2 |
| <i>Pilea pumila</i> | Clearweed | FACW | 5 |
| <i>Poa alsodes</i> | Bluegrass | FACW- | 9 |
| <i>Poa pratensis</i> | Bluegrass, Kentucky | FAC- | 3 |
| <i>Podophyllum peltatum</i> | May-apple | FACU | 3 |
| <i>Polygonatum hydropiperoides</i> | Water-pepper | OBL | 5 |
| <i>Polygonatum pubescens</i> | Solomon-seal, downy | UPL | 5 |
| <i>Polygonum convolvulus</i> | Bindweed, black | FAC- | * |
| <i>Polygonum hydropiperoides</i> | Water-pepper | OBL | 5 |
| <i>Polygonum lapathifolium</i> | Smartweed, nodding | FACW+ | 0 |
| <i>Polygonum pensylvanicum</i> | Smartweed, bigseed | FACW+ | 0 |
| <i>Polygonum persicaria</i> | Lady's-thumb | FACW | * |
| <i>Polygonum virginianum</i> | Jumpseed | FAC | 4 |
| <i>Populus deltoides</i> | Cottonwood | FAC+ | 1 |
| <i>Prenanthes altissima</i> | Lettuce, tall white | FACU | 5 |
| <i>Prunella vulgaris</i> | Heal-all | FAC | * |
| <i>Prunus serotina</i> | Cherry, wild black | FACU | 2 |
| <i>Prunus virginiana</i> | Choke-cherry | FAC- | 2 |
| <i>Pteridium aquilinum</i> | Fern, bracken | FACU | 0 |
| <i>Quercus alba</i> | Oak, white | FACU | 5 |
| <i>Quercus bicolor</i> | Oak, swamp white | FAC+ | 8 |
| <i>Quercus macrocarpa</i> | Oak, bur | FAC- | 5 |
| <i>Quercus palustris</i> | Oak, pin | FACW | 8 |
| <i>Quercus rubra</i> | Oak, red | FACU | 5 |
| <i>Quercus velutina</i> | Oak, black | UPL | 6 |
| <i>Rhamnus cathartica</i> | Buckthorn | FACU | * |
| <i>Rhamnus frangula</i> | Buckthorn, glossy | FACW+ | * |
| <i>Rhodotypos scandens</i> | Jetbead | UPL | * |
| <i>Ribes americanum</i> | Current, wild black | FACW | 6 |
| <i>Robinia pseudoacacia</i> | Locust, black | FACU- | |
| * | | | |
| <i>Rosa, multiflora</i> | Rose, multiflora | FACU | * |
| <i>Rubus allegheniensis</i> | Blackberry, common | FACU+ | 1 |
| <i>Rubus occidentalis</i> | Raspberry, black | UPL | 1 |
| <i>Rubus strigosus</i> | Raspberry, wild red | FACW- | 2 |
| <i>Sambucus racemosa (pubens)</i> | Elderberry, red | FACU+ | 3 |
| <i>Sassafras albidum</i> | Sassafras | FACU | 5 |
| <i>Setaria viridis</i> | Foxtail, green | UPL | * |
| <i>Smilacina racemosa</i> | Spikenard, false | FACU | 5 |
| <i>Smilacina stellata</i> | Solomon's seal, false starry | FAC- | 5 |
| <i>Smilax tamnoides</i> | Green-brier, bristly | FAC | 5 |
| <i>Solanum dulcamara</i> | Bittersweet-nightshade | FAC | * |
| <i>Solidago altissima</i> | Goldenrod, tall | FACU | 1 |

| | | | |
|------------------------|-------------------------|-------|---|
| Solidago caesia | Goldenrod, blue-stemmed | FACU | 7 |
| Solidago gigantea | Goldenrod, late | FACW | 3 |
| Tilia americana | Basswood | FACU | 5 |
| Toxicodendron radicans | Poison-ivy | FAC+ | 2 |
| Ulmus americana | Elm, American | FACW- | |
| 0 | | | |

| <u>Scientific name</u> | <u>Common name</u> | <u>Wetland category</u> | <u>Coefficient of Conservatism</u> |
|-------------------------|--------------------------|-------------------------|------------------------------------|
| Uvularia sessilifolia | Merrybells | FAC- | 5 |
| Verbena urticifolia | Vervain, white | FAC+ | 4 |
| Viburnum acerifolium | Arrow-wood, maple leaved | UPL | 6 |
| Viburnum dentatum | Arrow-wood, smooth | FACW- | 6 |
| Viburnum opulus | Cranberry, Eur. highbush | FAC | * |
| Viburnum rafinesquianum | Arrow-wood, downy | UPL | 5 |
| Viola sororia | Violet, common blue | FAC- | 1 |
| Vitis riparia | Grape, riverbank | FACW- | 3 |
| Zanthoxylum americanum | Prickly-ash | UPL | 3 |

APPENDIX A-2: PITCHER PARK

Pitcher Park is a fairly small park. Its dominant trees show that it contains elements of southern swamp, an oak/hickory forest, and beech-maple forest. Sassafras and tulip-trees are also found here—these are often found in Dry southern Forests (Oak Forests).

The Floristic Quality Index (FQI) for Pitcher Park is 28.12 including exotics and 30.48 for natives only. A total of 68 species were found, with 58 being native. Community types found are Southern Swamp, Mesic Southern Forest, and Dry-mesic Southern Forest.

1. Southern Swamp (wetter, flatter areas of the park)

Overview: A wetland deciduous forest type, located south of the transition zone.

Physiography and geology: Situated on glacial lake plains (and other areas outside of the former Lake Maumee basin).

Soils: Loam and silt loam soil (sometimes sandy loam) often possesses a clay layer; pH is neutral to slightly acid (in sandier soils).

Dominant plants: Trees include American elm, red and silver maples, and swamp white oak.

Associated species: Native shrubs include gray dogwood and spicebush. Herbaceous plants include small-flowered buttercup, poison-ivy, and jack-in-the-pulpit.

Weedy exotics: Some of the weedy plants are chives, European high-bush cranberry, several honeysuckles, Norway maple and bittersweet nightshade.

Similar communities: Barnes, in *Michigan Trees*, places most of these plants in the Deciduous Swamp Community. The closed forest type listed in *Michigan Natural Community Types* is Southern Swamp.

Natural processes: These sites are frequently ponded from spring into early summer, resulting in sparse a sparse ground cover, except on slightly higher microsites. Shumard oak also tends to thrive on these higher microsites.

Literature: *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Michigan Natural Plant Community Types. It is available from the Michigan Natural Features Inventory, Lansing, MI

2. Mesic Southern Forest (drier, sandy areas of the park)

Overview: “A southern hardwood forest type on moist ground with little oak.”

Physiography and geology: Situated on glacial lake plains (and other areas outside of the former Lake Maumee basin).

Soils: “Variable, with a predominance of clay to loam texture.”

Dominant plants: sugar maple, beech, red oak, and tulip-tree

Associated species: Native shrubs include redbud and witch-hazel. Herbaceous plants include red baneberry, enchanter’s nightshade, wild geranium, and wild yam.

Weedy exotics: Some of the weedy plants are chives, European high-bush cranberry, several honeysuckles, Norway maple and bittersweet nightshade.

Similar communities: Dry-mesic Southern Forest

Natural processes: “A natural preponderance of beech could possibly signify a longer time in mature forest conditions, but it could also be the result of heavy selective cutting of sugar maple or of moderately poor drainage conditions for which beech has better tolerance.”

Literature: *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Michigan Natural Plant Community Types. It is available from the Michigan Natural Features Inventory, Lansing, MI

3. Dry-mesic Southern Forest (driest areas of the park)

Overview: “An oak or oak-hardwood forest type on generally dry-mesic sites....”

Physiography and geology: “Occurring on sandy glacial lake plains (and other areas)....”

Soils: “Sandy loam and loam soils are slightly acid to neutral.”

Dominant plants: white ash, wild black cherry, shag-bark hickory, red maple, black, red, and white oak, and sassafras. Shrubs are bristly green-briar and witch-hazel.

Weedy exotics: Some of the weedy plants are chives, European high-bush cranberry, several honeysuckles, Norway maple, bittersweet nightshade, and sweet cherry.

Similar communities: Mesic Southern Forest

Natural processes: “Present Dry-Mesic Southern Forests were probably Oak Openings prior to fire suppression....”

Literature: *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Michigan Natural Plant Community Types. It is available from the Michigan Natural Features Inventory, Lansing, MI

Pitcher Park Botanical Survey Results

| Scientific name | Common name | Wetland category | Coefficient of Conservatism | |
|--|---------------------------|------------------|-----------------------------|---|
| <i>Acer negundo</i> | Box-elder | FACW- | 0 | |
| <i>Acer platanoides</i> | Maple, Norway | UPL | * | |
| <i>Acer rubrum</i> | Maple, red | FAC | 1 | |
| <i>Acer saccharinum</i> | Maple, silver | FACW | 2 | |
| <i>Acer saccharum</i> | Maple, sugar | FACU | 5 | |
| <i>Actaea rubra</i> | Baneberry, red | UPL | 7 | |
| <i>Agrimonia gryposepala</i> | Agrimony, tall | FACU+ | 2 | |
| <i>Allium schoenoprasum</i> | Chives | FAC+ | * | |
| <i>Arisaema triphyllum</i> | Jack-in-the-pulpit, swamp | FACW- | 5 | |
| <i>Athyrium filix-femina</i> | Fern, lady | FAC | 4 | |
| <i>Carex bebbii</i> | Sedge | OBL | 4 | |
| <i>Carex blanda</i> | Sedge | FAC | 1 | |
| <i>Carex pensylvanica</i> | Sedge | UPL | 4 | |
| <i>Carya ovata</i> | Hickory, shagbark | FACU | 3 | |
| <i>Cercis canadensis</i> | Redbud | FACU | 8 | |
| <i>Circaea lutetiana</i> | Enchanter's-nightshade | FACU | 2 | |
| <i>Collinsonia canadensis</i> | Richweed; stoneroot | FAC | | 8 |
| <i>Cornus foemina</i> | Dogwood, gray | FACW- | 1 | |
| <i>Dioscorea villosa</i> | Wild-yam | FAC- | 4 | |
| <i>Erythronium americanum</i> | Trout lily, yellow | UPL | 5 | |
| <i>Fagus grandifolia</i> | Beech, American | FACU | 6 | |
| <i>Fraxinus americana</i> | Ash, white | FACU | 5 | |
| <i>Geranium maculatum</i> | Geranium, wild | FACU | 4 | |
| <i>Hamamelis virginiana</i> | Witch-hazel | FACU | 5 | |
| <i>Juglans nigra</i> | Walnut, black | FACU | 5 | |
| <i>Lindera benzoin</i> | Spicebush | FACW- | 7 | |
| <i>Liriodendron tulipifera</i> | Tulip-tree | FACU+ | 9 | |
| <i>Lonicera maackii</i> | Honeysuckle, amur | UPL | * | |
| <i>Lonicera tatarica</i> | Honeysuckle, Tartarian | FACU | * | |
| <i>Maianthemum canadense</i> | Canada-Mayflower | FAC | 4 | |
| <i>Onoclea sensibilis</i> | Fern, sensitive | FACW | 2 | |
| <i>Osmunda regalis</i> | Royal-fern | OBL | 5 | |
| <i>Oxalis fontana</i> (<i>O. europaea</i>) | Wood-sorrel, yellow | FACU | 0 | |
| <i>Parthenocissus quinquefolia</i> | Virginia-creeper | FAC- | 5 | |
| <i>Poa alsodes</i> | Bluegrass | FACW- | 9 | |
| <i>Podophyllum peltatum</i> | May-apple | FACU | 3 | |
| <i>Polygonum persicaria</i> | Lady's-thumb | FACW | * | |

| | | | |
|-----------------------------------|---------------------------|-------------------------|---------------------|
| <i>Populus deltoides</i> | Cottonwood | FAC+ | 1 |
| <i>Prenanthes altissima</i> | Lettuce, tall white | FACU | 5 |
| | | | Coefficient of |
| <u>Scientific name</u> | <u>Common name</u> | <u>Wetland category</u> | <u>Conservatism</u> |
| <i>Prunus avium</i> | Cherry, sweet | UPL | * |
| <i>Prunus serotina</i> | Cherry, wild black | FACU | 2 |
| <i>Prunus virginiana</i> | Cherry, choke | FAC- | 2 |
| <i>Quercus alba</i> | Oak, white | FACU | 5 |
| <i>Quercus bicolor</i> | Oak, swamp white | FAC+ | 8 |
| <i>Quercus rubra</i> | Oak, red | FACU | 5 |
| <i>Quercus velutina</i> | Oak, black | UPL | 6 |
| <i>Ranunculus abortivus</i> | Buttercup, small-flowered | FACW- | 0 |
| <i>Ribes cynosbati</i> | Gooseberry, prickly | UPL | 4 |
| <i>Rosa multiflora</i> | Rose, multiflora | FACU | * |
| <i>Rubus allegheniensis</i> | Blackberry, common | FACU+ | 1 |
| <i>Rubus strigosus</i> | Raspberry, wild red | FACW- | 2 |
| <i>Sassafras albidum</i> | Sassafras | FACU | 5 |
| <i>Smilacina racemosa</i> | Spikenard, false | FACU | 5 |
| <i>Smilax tamnoides</i> | Green-brier, bristly | FAC | 5 |
| <i>Solanum dulcamara</i> | Bittersweet-nightshade | FAC | * |
| <i>Solidago caesia</i> | Goldenrod, blue-stemmed | FACU | 7 |
| <i>Solidago gigantea</i> | Goldenrod, late | FACW | 3 |
| <i>Taraxacum officinale</i> | Dandelion, common | FACU | * |
| <i>Thelypteris noveboracensis</i> | Fern, New York | FAC+ | 5 |
| <i>Toxicodendron radicans</i> | Poison-ivy | FAC+ | 2 |
| <i>Trillium grandiflorum</i> | Trillium, common | UPL | 5 |
| <i>Ulmus americana</i> | Elm, American | FACW- | |
| 1 | | | |
| <i>Uvularia sessilifolia</i> | Merrybells | FAC- | 5 |
| <i>Viburnum dentatum</i> | Arrow-wood, smooth | FACW- | 6 |
| <i>Viburnum opulus</i> | Cranberry, Eur. highbush | FAC | * |
| <i>Viola sororia</i> | Violet, common blue | FAC- | 1 |
| <i>Vitis riparia</i> | Grape, riverbank | FACW- | 3 |
| <i>Zanthoxylum americanum</i> | Prickly-ash | UPL | 3 |

APPENDIX A-3: BALDUCK PARK

Surveyed by Brian Klatt, Ellen Elliott Weatherbee, Suzan Campbell, and Andrew Hartz (Michigan Department of Environmental Quality) in Fall, 2003

Balduck Park park is fairly small and is surrounded by a residential area and open parkland. The trees show an interesting mix and include at least five species of oak, including Shumard oak, a relatively new find in Michigan, although it has been known from neighboring Ontario. *Michigan Trees* (Barnes and Wagner) places this oak in the Deciduous Swamp Community, which is described as, “Occurring mainly in southern Michigan, the habitat is wet and cool. Water tables are high, they fluctuate only slightly, and water and nutrients are available to tree roots throughout the year—although oxygen, required for root respiration, is lacking. Soil drainage is poor to very poor.” Barnes sites other tree associates as being silver maple, eastern cottonwood, pin oak, swamp white oak, pumpkin and red ashes, shellbark and shagbark hickories, American elm, and *Crataegus* spp. “(hawthorns). All but the pumpkin oak and the shellbark hickories are found on the Balduck site.

Weatherbee’s is in agreement with Ms. Suzan Campbell that the existing list of Michigan Natural Community Types is not adequate for addressing Balduck Park. Consequently, we have developed a new community description, following the format of MNFI descriptions; it is presented in detail in Appendix A-3.

Wetland Oak Forest (Community Type), proposed;

Overview: A wetland deciduous forest type, located in southeast Michigan on areas formerly occupied by the glacial Lake Maumee (Maumee lake plain)

Physiography and geology: Occurs on “clayey glacial lake plains, especially in Wayne County (and Monroe County) where sites dry out significantly in summer, unlike swamps whose water table remains high throughout the growing season.” Shumard oak occurs on “slightly higher microsites than its associates.” (*Michigan Trees*)

Soils: “fertile, heavy-textured, clayey soils that are seasonally wet or flooded and poorly drained.”

Dominant plants: Shumard oak, white oak, bur oak, and pin oak. The putative hybrid *Quercus bicolor* x *Q. macrocarpa* (swamp white/bur oak hybrid) is probably also present and was identified by Suzan Campbell. The Shumard oak is “special concern” in Michigan. In addition to the oaks, other mature trees are red and silver maples, bitter-nut and shagbark hickory, and cottonwood. Shell-bark hickory should be looked for here also, since, according to Barnes, it is a common associate of Shumard oak.

Associated species: Native shrubs include nannyberry, prickly ash, and smooth arrow-wood. Herbaceous plants include wild ginger, side-flowering aster, wild geranium, sensitive fern, and running strawberry-bush.

Weedy exotics: Common privet, the Tartarian honeysuckle, multiflora rose, and European high-bush cranberry

Similar communities: Barnes, in *Michigan Trees*, places this type of Shumard oak-dominated forest in a Deciduous Swamp Community. The closed forest type listed in *Michigan Natural Community Types* is Southern Swamp, although no oaks are mentioned.

Natural processes: These sites are frequently ponded from spring into early summer, resulting in sparse a sparse ground cover, except on slightly higher microsites. Shumard oak also tends to thrive on these higher microsites.

Literature: *Michigan Trees, A Guide to the Trees of the Great Lakes Region*, by Burton V. Barnes and Warren H. Wagner, Jr., revised and updated by Burton V. Barnes in 2004.

Michigan Natural Plant Community Types. It is available from the Michigan Natural Features Inventory, Lansing, MI

Botanical Survey Results for Balduck Park

| Scientific name | Common name | Wetland category | Coefficient of Conservatism |
|------------------------------------|--------------------------|------------------|-----------------------------|
| <i>Acer rubrum</i> | Maple, red | FAC | 1 |
| <i>Acer saccharinum</i> | Maple, silver | FACW | 2 |
| <i>Asarum canadense</i> | Wild-ginger | UPL | 5 |
| <i>Aster lateriflorus</i> | Aster, side-flowering | FACW- | 2 |
| <i>Carpinus caroliniana</i> | Hornbeam | FAC | 6 |
| <i>Carya cordiformis</i> | Hickory, bitter-nut | FAC | 5 |
| <i>Carya ovata</i> | Hickory, shagbark | FACU | 3 |
| <i>Cornus foemina</i> | Dogwood, gray | FACW- | 1 |
| <i>Crataegus crus-galli</i> | Thorn, cockspur | FAC | 5 |
| <i>Euonymus obovata</i> | Strawberry-bush, running | UPL | 5 |
| <i>Fraxinus pennsylvanica</i> | Ash, green | FACW | 2 |
| <i>Geranium maculatum</i> | Geranium, wild | FACU | 4 |
| <i>Glyceria striata</i> | Manna-grass, floating | OBL | 4 |
| <i>Juncus tenuis</i> | Rush, path | FAC | 1 |
| <i>Ligustrum vulgare</i> | Privet, common | FAC- | * |
| <i>Lonicera tatarica</i> | Honeysuckle, Tartarian | FACU | * |
| <i>Lysimachia ciliata</i> | Loosestrife, fringed | FACW | 4 |
| <i>Menispermum canadense</i> | Moonseed | FAC | 5 |
| <i>Onoclea sensibilis</i> | Fern, sensitive | FACW | 2 |
| <i>Parthenocissus quinquefolia</i> | Virginia-creeper | FAC- | 5 |
| <i>Polygonum virginianum</i> | Jumpseed | FAC | 4 |
| <i>Populus deltoides</i> | Cottonwood | FAC+ | 1 |
| <i>Potentilla simplex</i> | Cinquefoil, common | FACU- | |
| 2 | | | |
| <i>Prunus virginiana</i> | Choke-cherry | FAC- | 2 |
| <i>Ribes americanum</i> | Current, wild black | FACW | 6 |

| | | | |
|------------------------|--------------------------|-------------------------|------------------------------------|
| Rosa multiflora | Rose, multiflora | FACU | * |
| <u>Scientific name</u> | <u>Common name</u> | <u>Wetland category</u> | <u>Coefficient of Conservatism</u> |
| Smilax tamnoides | Green-brier, bristly | FAC | 5 |
| Staphylea trifolia | Bladdernut | FAC | 9 |
| Tilia americana | Basswood | FACU | 5 |
| Toxicodendron radicans | Poison-ivy | FAC+ | 2 |
| Ulmus americana | Elm, American | FACW- | |
| 1 | | | |
| Viburnum dentatum | Arrow-wood, smooth | FACW- | 6 |
| Viburnum lentago | Nannyberry | FAC+ | 4 |
| Viburnum opulus | Cranberry, Eur. highbush | FAC | * |
| Viola sororia | Violet, common blue | FAC- | 1 |
| Vitis riparia | Grape, riverbank | FACW- | 3 |
| Zanthoxylum americanum | Prickly-ash | UPL | 3 |