

Resurgence of the Wild After Bulldozers; September 2009 N. Aten



Airline Yards Landscape Restoration Plan (LRP)
DRAFT Concept Plan
16 February 2010
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prepared for Menomonee Valley Partners, Inc.

This is Part One of the Landscape Restoration Plan for Airline Yards. Part One is the Concept Plan, providing the background and ecological restoration goals, proposed land and soil preparation, and plans describing vegetation communities, for team and stakeholder review resulting in agreement of restoration zones and plant communities, probable implementation sequencing, and acceptable techniques. Part Two, the Detailed Plan, will provide plans, specifications, and estimates, resolving the sequencing of implementation work with materials, quantities, equipment, techniques, and timing.

The planned transformation of Airline Yards from bare ground to eventual premiere natural area, in a participatory restoration process, merits a thoughtful treatment of restoration possibilities, goals and expectations. The Society for Ecological Restoration's *Guidelines for Ecological Restoration* provide the framework used to develop the plan.

REVIEW OF PROJECT BACKGROUND



(Above) 1995 Aerial of Airline Yards area, looking east. 35th Street Viaduct in foreground.

(Below Left) 2006 Airline Yards after recent fill placed, looking east from the 35th Street Viaduct.



Airline Yards Landscape Restoration Concept Plan

The Project Site is the 24 acres of Airline Yards (shown left) owned by the City of Milwaukee, bounded by CP Rail on the south, the Menomonee River on the north and the 35th Street Viaduct, plus the additional small acreage west of the 35th Street Viaduct to the termination of the Valley Passage project area.

This Landscape Restoration Plan (LRP) interacts closely with the “Hank Aaron State Trail Natural Area and Pedestrian Bridges” (VP11) project. The VP11 project includes two bike / pedestrian bridges, a significant segment of the Hank Aaron State Trail (HAST), grading plans, river cuts, earthwork, and generally forms the foundation of the ecological restoration to create a premiere natural area. This public natural area will provide river access for fishing and canoeing, it will re-create mounds in characteristic historic glacial forms, and serve as the basis of an urban environmental education program through the Urban Ecology Center (UEC) serving 22 neighborhood schools.

Wenk Associates of Denver, CO created the Master Plan for the Menomonee Valley Industrial Center (MVIC) and Community Park. The Master Plan includes approximately 48 acres of greenspace that will be operated and managed by the Wisconsin Department of Natural Resources (WDNR) as part of the Hank Aaron State Trail (HAST) (~29 acres along the south bank including this Project Site, and ~19 along the north bank, not including the recreation areas to the north). The plan considered both ecology and economy. One expression of this balance is that of the areas with acreage beyond a narrow riparian

corridor, ten acres (eight in Stormwater Park and proposed two in Airline Yards) were reserved to provide the river a degree of floodplain (albeit at a relatively high flow elevation), while the 24-acre Airline Yards was designated to accommodate substantial additional fill from a Wisconsin Department of Transportation (WDOT) freeway construction project, precluding significant river-floodplain connection in that area. The fill agreement with the City of Milwaukee, however, provided the bulk of the overall funding for brownfield remediation and the stormwater treatment train natural areas - and per the master plan, provides an excellent opportunity for the ecological restoration of those 24 acres that will take advantage of slope and aspect variability to provide significant habitat diversity and species biodiversity. Although the floodplain benefits of the overall project are modest, keeping most of the riverbank undisturbed allows maintaining the integrity of the mature native tree canopy continuously along the river corridor, important for migratory birds as well as for the river system.

In the years since the Master Plan, substantial stakeholder, community, and technical advisory input has refined the plans for the Airline Yards site as they are today. Those plans included a 2' grading plan and corresponding cut/fill plan, conceptual landscape zones plans, and the locations of trails, bridge landings, and canoe launch.

More specifically, VP11 is planned to include two pedestrian bridges; trails; a cut riverbank to provide a backwater terrace to increase ultimate habitat diversity; pedestrian river access points; toe of slope and bioengineered riverbank restoration; attention to potential erosion, particularly near and at riverbank, and near trails; earthwork for rough and final grading, incorporating and structuring appropriate soils, and soil stabilization measures that anticipate the landscape restoration.

The existing site conditions include the steep riverbank and flashy river; existing stands of mature native trees along riverbank to be protected; a WDNR Remedial Action Plan (RAP) covering the entire project area; little native soil even on riverbank, where soil is largely historic fill over former marsh and floodplain, with low structural stability.

The LRP, like all Valley projects, must adhere to the Menomonee Valley Sustainable Design Guidelines. As with the entire Menomonee Valley project, this Project's ability to serve as a model for sustainable development, as well as to educate about principles of sustainability, is important to all Project Partners.

The LRP will be guided by the Society for Ecological Restoration (SER)'s *Guidelines for Ecological Restoration*.

Landscape Restoration is a process, and not as simply divided into construct + maintain, or even construct + establish + maintain. This process has a variety of options (and ranges in elapsed time) which will be influenced by UEC programming and stewardship requirements and WDNR's management requirements – school programs and community programs; funding availability; sequencing of earthwork; qualified contractor availability; seasons; etc. In addition, plant communities are living things managed adaptively; the LRP alternatives will balance some of the advantages of working at a slower manageable pace with some of the advantages of faster-paced critical mass transformation. The LRP will consider the following milestones in providing phasing options:

- (1) “*Complete for community-engaged restoration*” – Heavy/earthwork equipment completed and excluded/ isolated from all or sequenced portions of Airline Yards (this enables UEC community programming to participate in restoration and allows for community use of all or sequenced portions of the HAST)
- (2) “*Complete for full school programs*” – Agricultural equipment use completed and first wave restoration completed in all or sequenced portions of Airline Yards (beyond cover crop or agricultural crop; generally no more mechanized equipment in Airline Yards)
- (3) “*Ready for sustained management*” – Landscape restoration on positive and manageable trajectory in all or sequenced portions of Airline Yards.

LANDSCAPE HISTORY

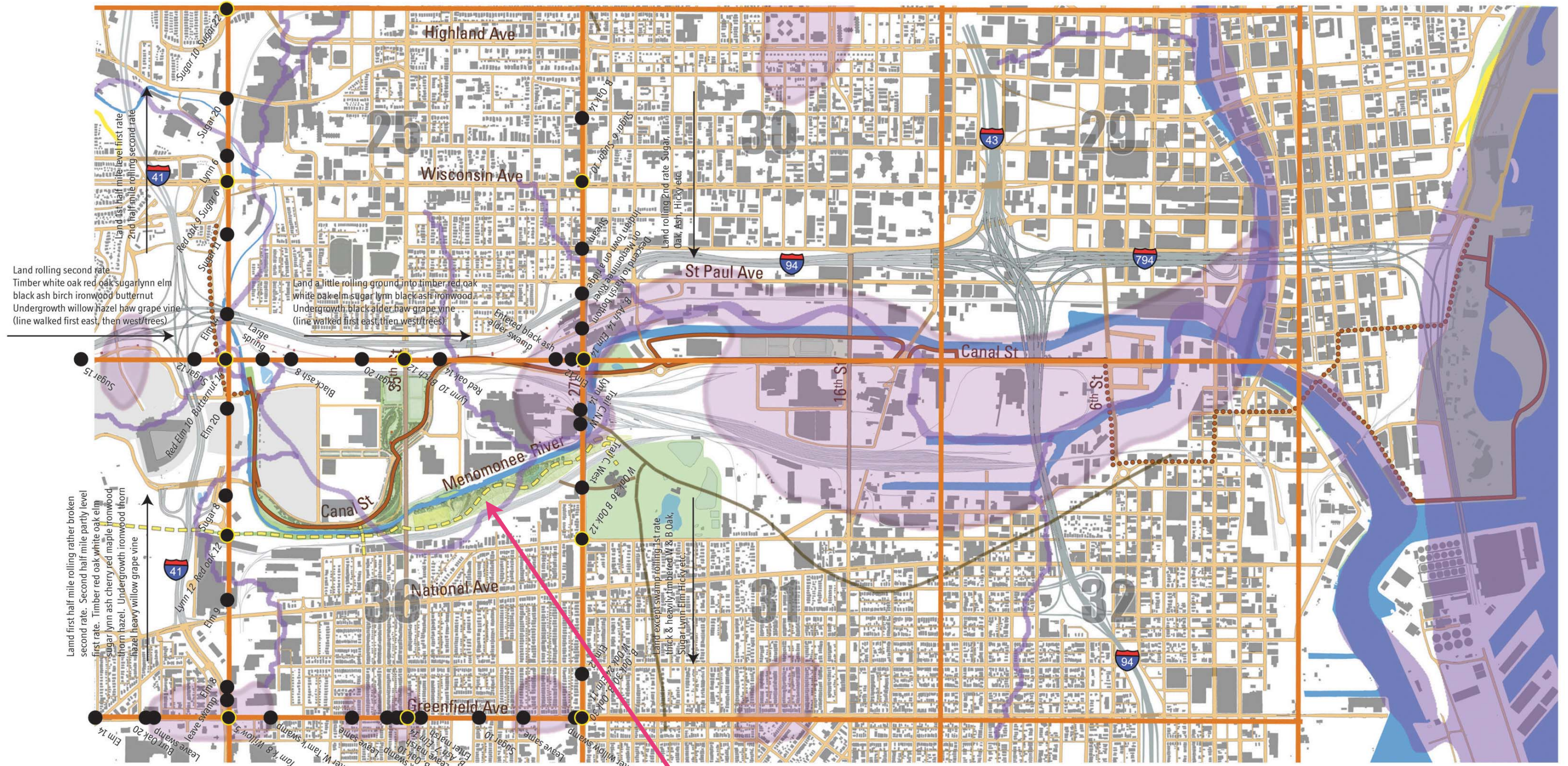
The Menomonee Valley is much-altered from pre-settlement conditions. The U.S. General Land Office (GLO) Surveys of 1835-1836 (see next page) indicate the substantial open marsh from present-day 30th St east, as well as tamarack swamp and willow swamp. The remaining land was a largely forested landscape (sometimes described as “rolling first rate”), ranging from floodplain forest to upland forest atop the bluffs, and indications of oak openings.

"This Township (7N21E) Generally Speaking is good land - surface rolling but nothing like hills excepting on the Menomony which is nothing but Bluffs and very few(?) of them the highest of which is not 100 feet. Timber is good with very little exception. Stone is not very plentiful on the surface consisting of Granite and Lime Stone. Lime Stone appears below the surface which is in the bottom of Runs Brooks and Creeks. There is much old improvement throughout this Township consistant(?) of rows similar to corn rows which is plain to be seen and covered with the forest growth of Timber. There is also some small mounds(?). I have not left a record of those improvements on act of long time on the ground nearly throughout the Survey."

1835-1836 Historic Trees and Historic River,
Menomonee Valley
September 2009

7N21E

7N22E



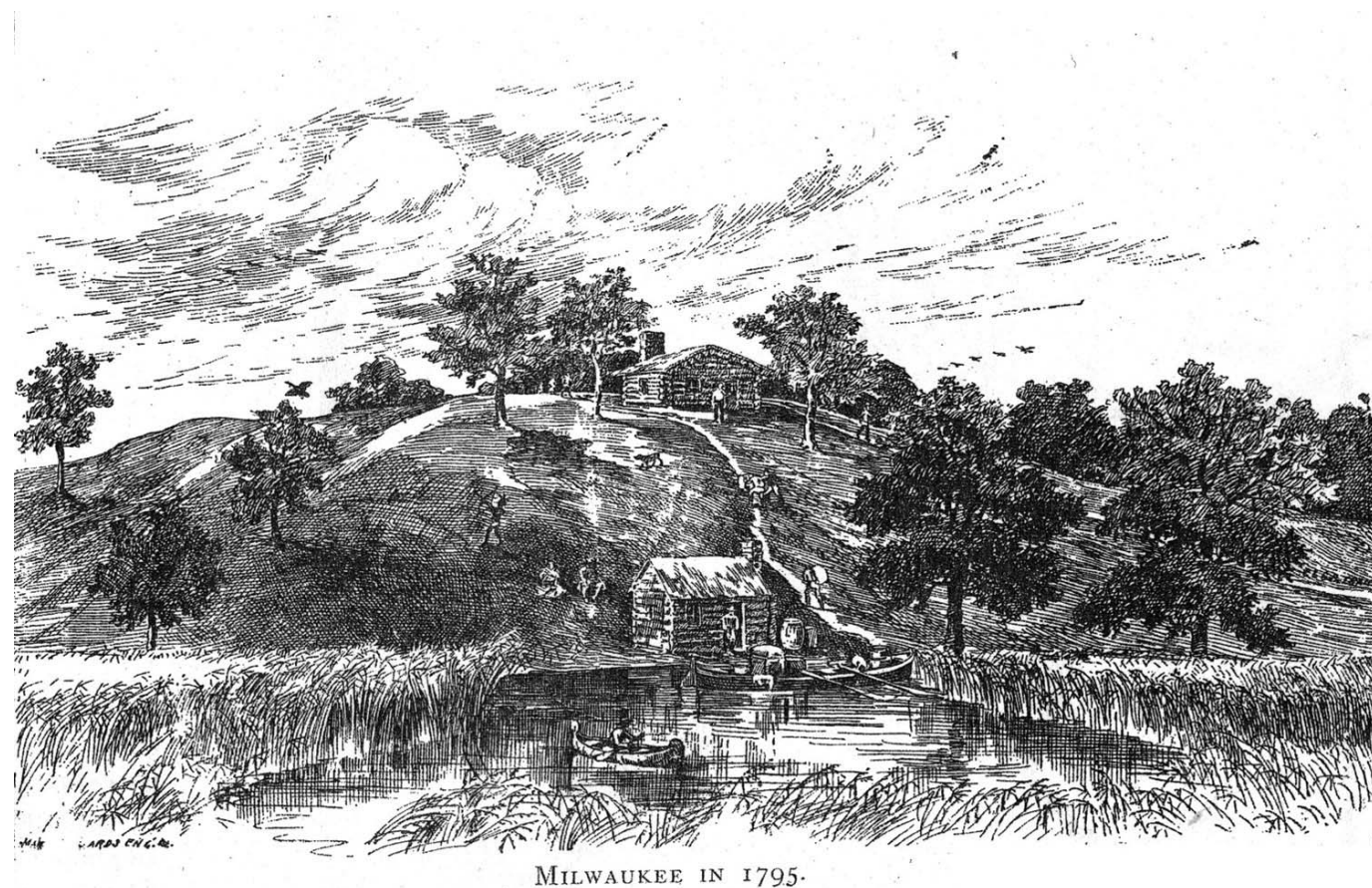
Land rolling, second rate
Sugar, Ironwood, Lynn etc.

Land except swamp rolling
second rate. Sugar, Oak, etc.

Project Site. In this transcription of the Survey notes and drawings, section lines are correlated and the original drawings are traced (purple for water and brown for trails). The arrangement of text and arrows along the section lines follows the surveyor's walking path(s). At quarter section points (circled in yellow), the exact position of the marker trees are provided in the notes. Note that this surveyor did not record walking interior quarter section lines, and the drawn stream courses interior to the section must be interpreted with that in mind.

Lloyd Shinnars, a student of Aldo Leopold, describes the history of Milwaukee flora evocatively in his thesis: “All the region was covered by glacial ice during its last advance. Beyond the front of the ice at the time it had reached its farthest south lay a narrow strip of tundra, and a broader strip of coniferous forest. Beyond these lay deciduous forest, centering in the southern Alleghenies and the Ozarks. To the southwest was prairie. The tundra flora passed through our region quickly and disappeared to the north. Evergreen forest followed, filling the lowlands with tamarack swamps and the highlands with pine forest. But those did not remain long except in the coolest and dampest places. The climate was warm and dry, and the prairie moved in from the southwest. One line of march ran along the highest ground, following the kettle moraine up to Green Bay. As the land became drier, it spread onto sandy and finally onto drier soils, covering nearly all of our area. Another line of march came through central Illinois and up the broad, sandy shores of the predecessors of Lake Michigan, which have since been washed away, and reached at least as far as Milwaukee. When the melted ice had given rise to a chain of lakes whose shores stretched almost continuously to the ocean, a pathway was opened for plants from the sea beaches and adjoining parts of the coast. Deciduous forest was the last to arrive, coming in two divisions: oak-hickory moving up stream valleys from the south, and beech-maple coming overland from the east around the north end of Lake Michigan after being partly deflected by the prairie at the south end. The two arms of deciduous forest were closing in on our area when the first settlers arrived, opening the way for a new flora, the weeds, and disrupting the succession of those already present.” (Shinnars 1940)

An 1881 account (Ingersoll 1881) describes the shipping and railroad transformation of the Valley, “...the old miles square of marsh has dwindled to a few well-curbed canals and deep slips where vessels lie to be loaded...”, imagining that in earlier days looking in from the lake was “an immense swamp of wild rice, with a sand-bar and a hill or two to break the surf, and a distant view of forest-clad hills and oak openings beyond...”.

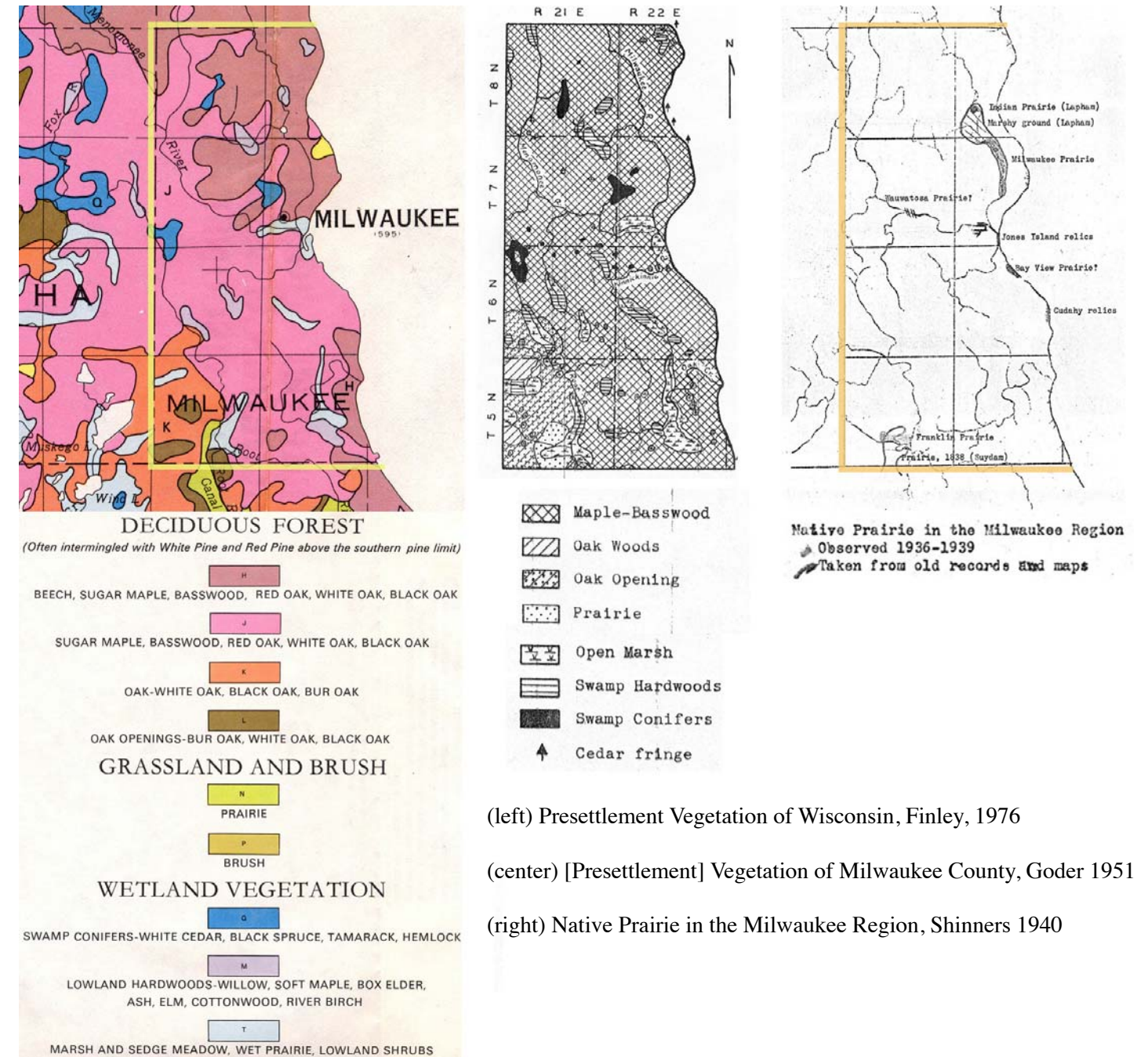


¹ See Attachments, Lapham Floras

The presence of fire-dependent oak openings in the immediate area is supported by the well-known engraving of the Vieau trading post and its landscape (below left, engraved in 1880s and accuracy confirmed by Vieau’s son), and is also supported by the Lapham florals of 1836, 1838, and 1840¹, which include a significant number of partial-light-dependent indicator species for oak savanna.

The maps below, left and center, are compilations of pre-settlement vegetation in Milwaukee County (outlined in yellow), based on the 1835-1836 GLO Land Survey data, including the authoritative Finley map. The pre-settlement vegetation map provides the general potential for vegetation restoration, in our transformation of a highly altered landscape.

Although prairies are not indicated in the Valley’s historic surveys, compilations of Lapham’s notes by Shinnars in 1940 as well as his own fieldwork, indicate several significant prairies in Milwaukee County (shown at right, third map). Prairie may have existed in the Valley as a minor component as part of the plant community tapestry.



(left) Presettlement Vegetation of Wisconsin, Finley, 1976

(center) [Presettlement] Vegetation of Milwaukee County, Goder 1951

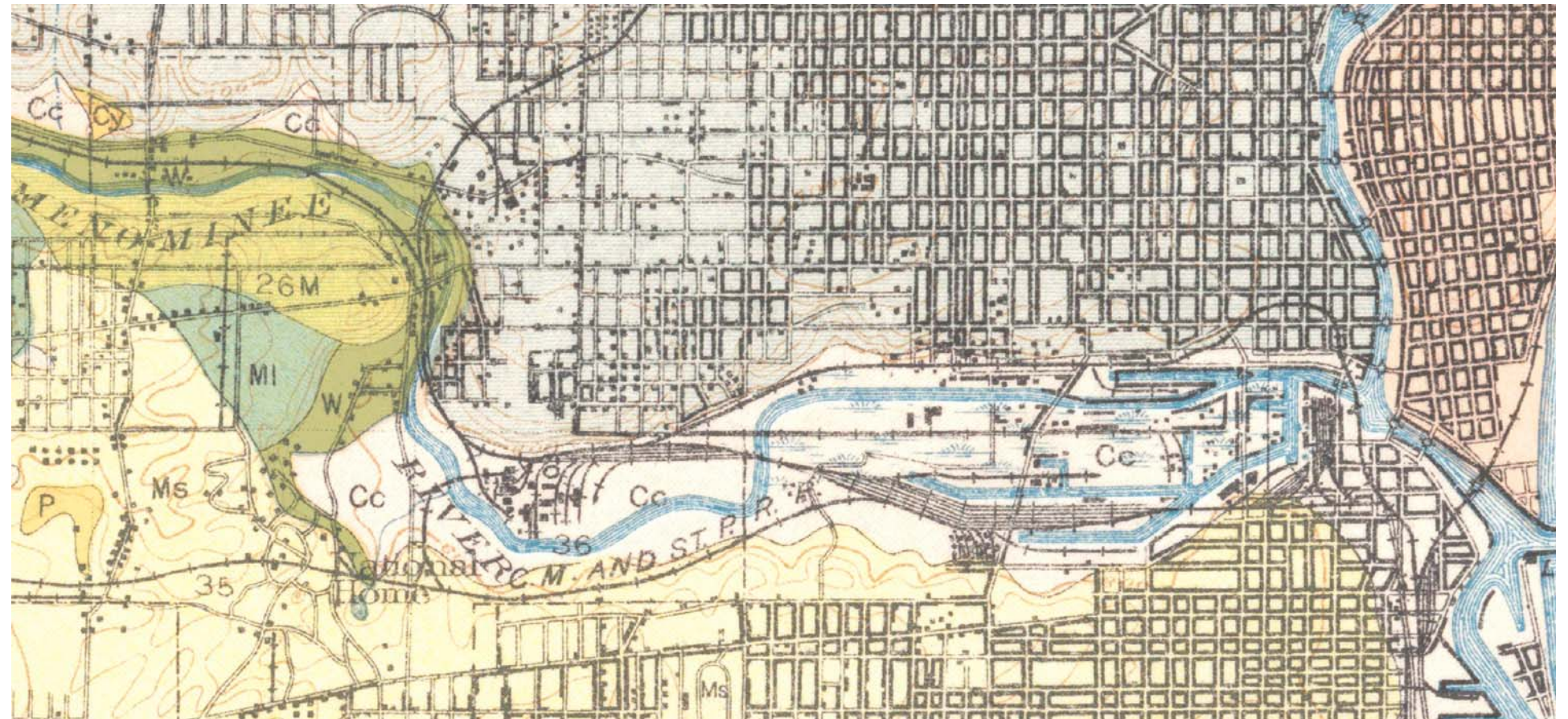
(right) Native Prairie in the Milwaukee Region, Shinnars 1940

Oak openings deserve a bit of additional background given their applicability to this site. J. S. Buck, in 1881, wrote of the south-facing bluffs along the north side of the Valley, “These bluffs were exceedingly beautiful in a state of nature. Their fronts were bold and round, and from Spring Street (Wisconsin Avenue) to the Menomonee, and from Seventh to Twenty-fifth streets, were covered with a young and thrifty growth of oak, mostly being what is termed ‘openings’.”

John G. Gregory, in 1931, quotes from writings of several early visitors and residents. He notes a variety of opinions, from those discouraged by the “swamps”, to those inspired by the beauty of the bluffs. In several cases, oak openings are described. In 1895, about his arrival in 1842, Selby recalled: “In 1842, little had been done to alter the natural beauty of Milwaukee. The low land along the two rivers (Milwaukee and Menomonee), extending back from thirty to sixty rods [approximately 150-300 meters], was covered with a healthy growth of shrubs that were indigenous to the marshy ground they sprang from. The hills, or more correctly I should say the uniform bluffs that surrounded the low land, had an imposing and beautiful aspect, rising quite abruptly from forty to sixty feet, and were covered by native forests, in front by oak openings and behind by dense trees of oak, maple, beech, and other hardwood timber. The ground under the openings was carpeted by the native grass.” In 1880, about his visit in 1830, Loomis wrote: “On the east bluff, the expanse of the whole point... was dry, and somewhat undulating, with gullied openings, where were what the French call Bois franc – free woods – and intersected with Indian trails.”

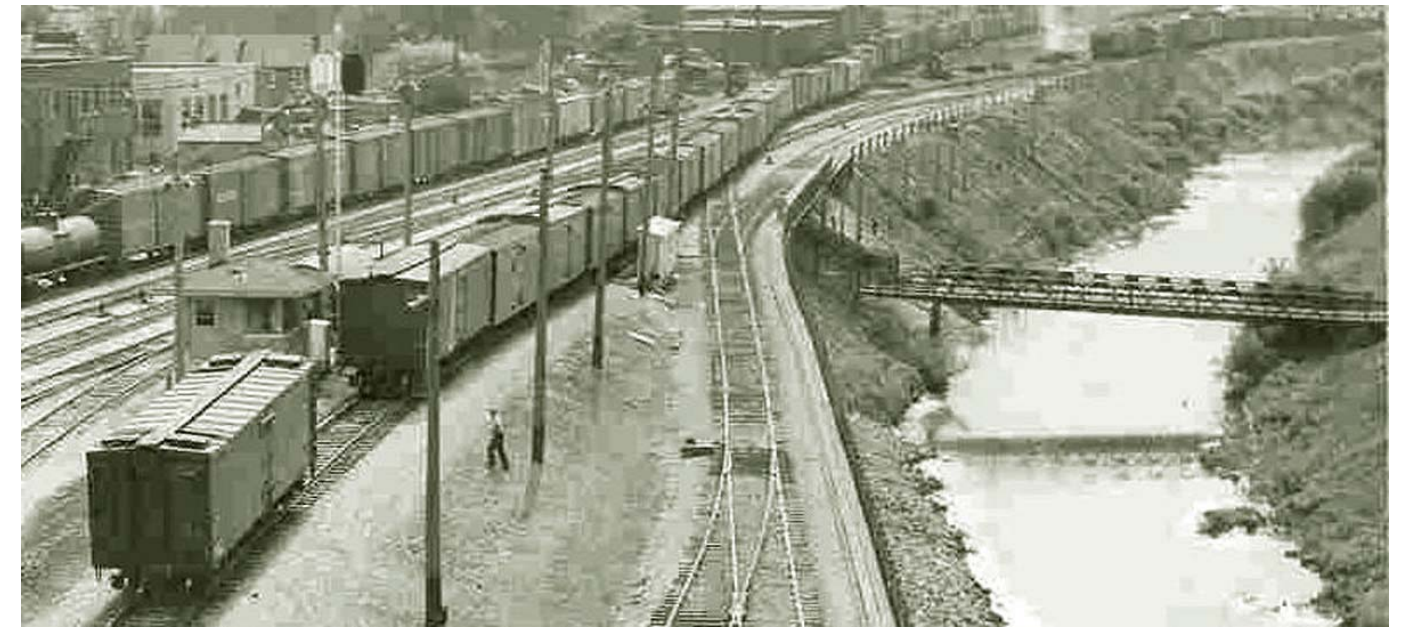
Oak openings, although described in these early writings, are not of great significance in survey records for Milwaukee; this may be in part due to their smaller-size patches here (smaller than the survey resolution), as well as perception of them as a transitional community (Randy Powers, personal communication). The Valley surveys indicate “B. Oak”, which here is likely Bur Oak than Black Oak. Increase Lapham documented “Burr Oak” in his 1838 flora. Bur Oaks indicate a fire-evolved oak savanna (per Curtis, Bur Oaks which avoid fire until 12-15 years old, then survive most fires due to their thick bark - unlike most forest species - and burned trees will sprout from the root crown or stump). Curtis’ definition of the structure of oak savanna is a range from one tree per acre to a maximum density of 50% canopy cover. O’Connor et al defines from one to 30 canopy trees, usually oak, per acre; equating roughly to a canopy cover between 5% and 60%.

Oak savannas in present day are a decidedly under-represented natural landscape (according to recent Wisconsin oak savanna researchers, Nuzzo 1986 and Leach and Givnish 1999, something less than 0.02% of the original area of oak savannas remain in remnants). Although Milwaukee County represents the northeastern edge of historic oak savanna landscape range in Wisconsin, restoring this community has particular value given its historic loss: intrinsic value, and the value of providing access to this natural community to the large urban population of the surrounding neighborhoods.



Today, the river is on a human-altered course, and the Valley's former marsh is raised several feet as a result of filling from the bluffs. In Airline Yards in particular, little historic condition exists: not the soil, seedbank, topography, hydrology, vegetation. (Uhrinak 2002 notes that "Richard Barloga suspects that some attempts at bluff cutting and Valley filling would have resulted in the first loads of bluff top topsoil being deposited on top of existing topsoil at the base of bluff slopes").

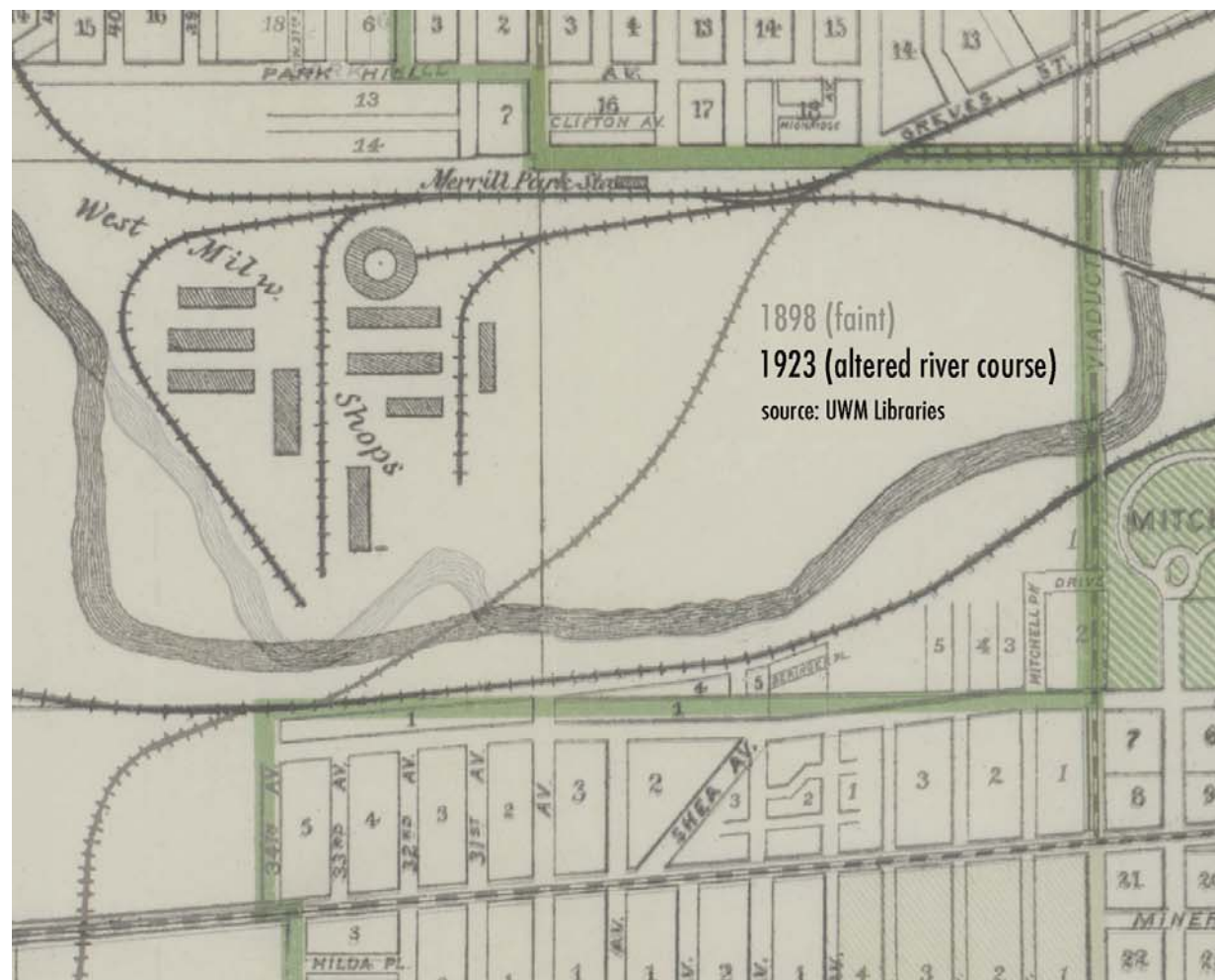
The photograph of the historic footbridge (right) at the location of the planned Valley Passage shows barren riverbanks (and filled land) in this area; thus the current riverbank vegetation is relatively young (<100 years old). However, an urban restoration can hardly ignore the benefits that this eighty-year head start provides. In this altered landscape, certain native species were advantaged: for example, cottonwood with its early successional life strategies (abundant, wind-blown and floating seed; high germination rate; fast growth) is presently common and was likely uncommon historically.



The time period 1898 - 1923 (right) included river course alterations west of 35th Street (note older street numbers on the map which were later corrected) and the construction of a rail and pedestrian bridge.

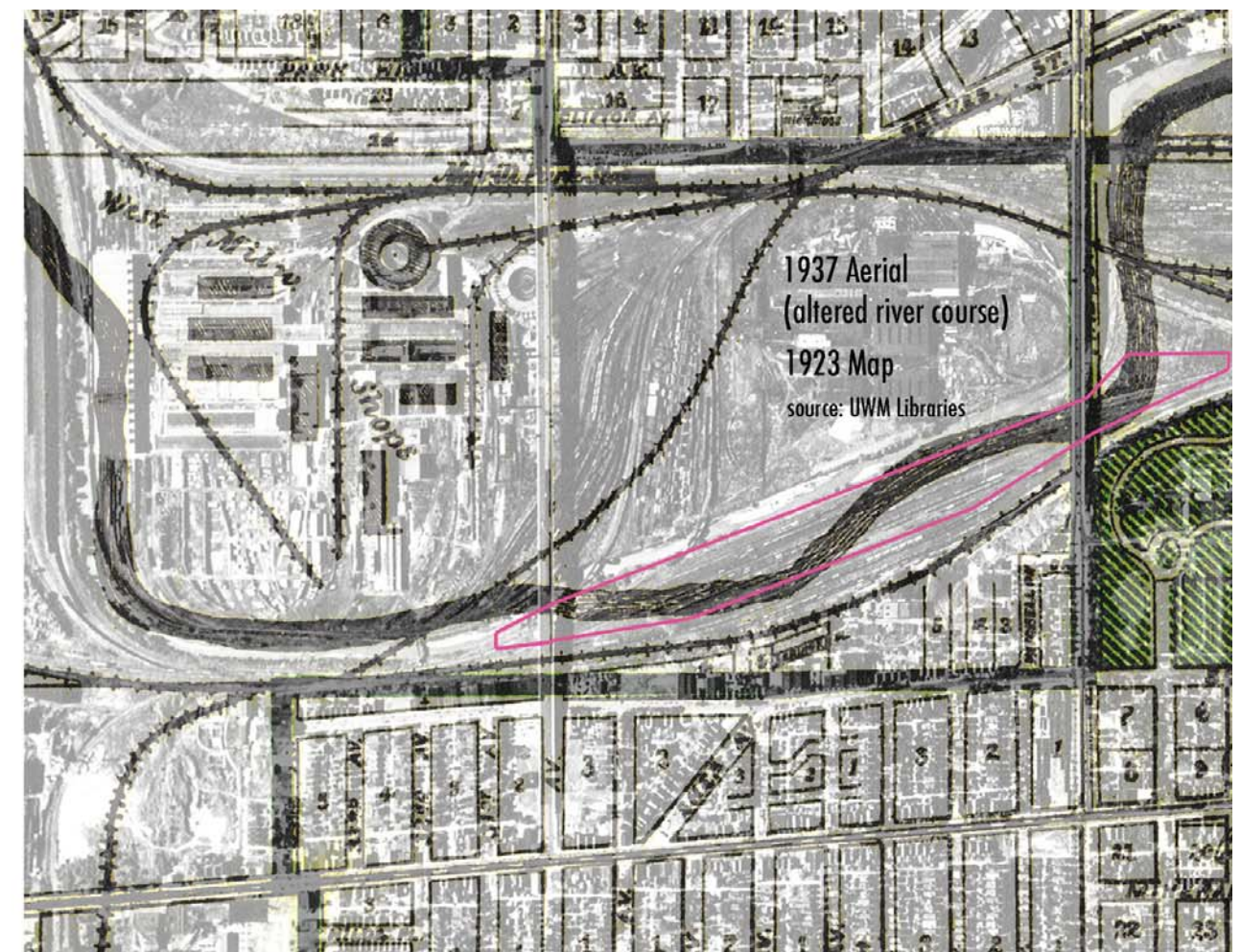
By 1937 (far right) the river course east of 35th appears to have been altered as well, to build additional rail lines in Airline Yards.

(This may also provide insight into the soil profile in Airline Yards).



35th St
Viaduct

27th St
Viaduct



35th St
Viaduct

Approximate Project Site Outlined

27th St
Viaduct

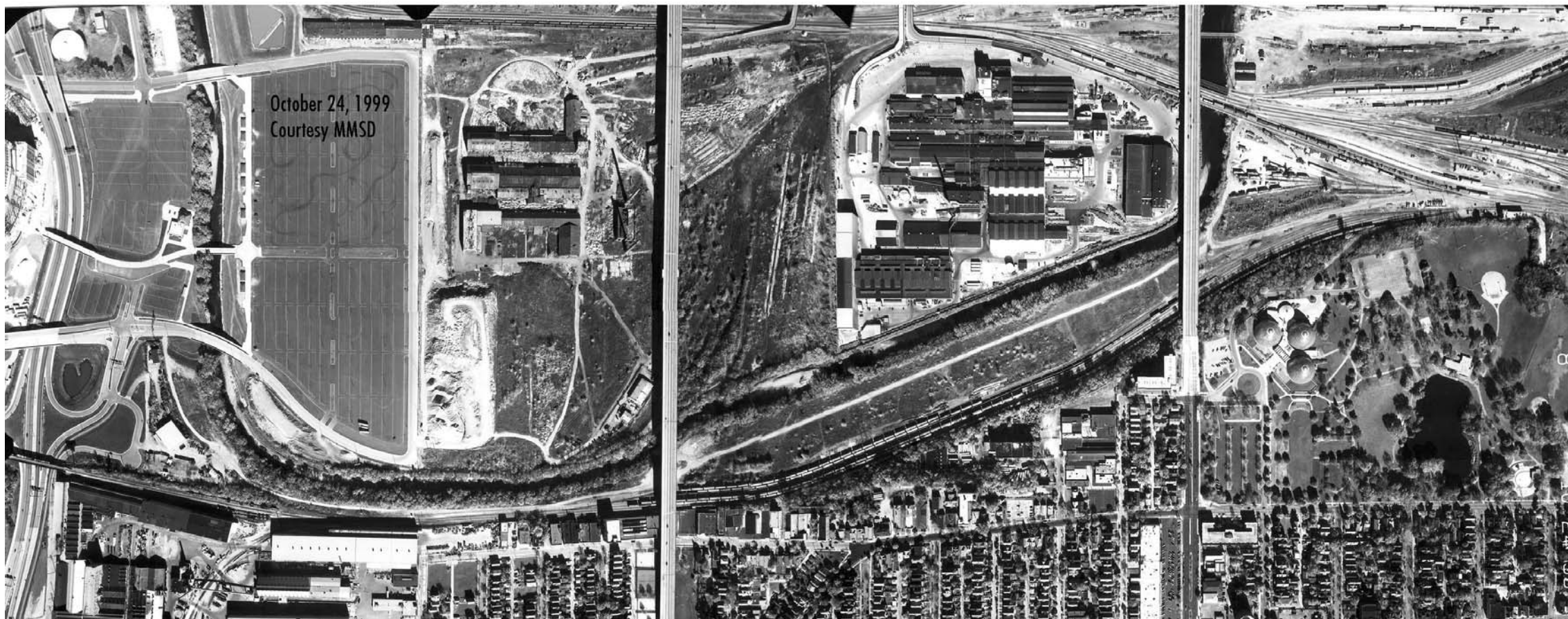


As to recent history: During the abandonment of railroad operations, two bridges crossing the river in Airline Yards between 35th and 33rd were removed, leaving wood piers and other abutment remnants, as well as ravines/gullies in the riverbank corresponding to the bridge alignment.

Fill, some impacted, from the Marquette Interchange project and from Stormwater Park, has been stockpiled in Airline Yards and temporarily capped. Import and stockpiling of fill ended largely in 2006.

Topsoil has also been stockpiled and mounded separately, largely ending in 2007. This material came from City Forestry stump grindings and topsoil and has been relatively fertile in terms of weed growth (compared to the clay fill); however, below the present surface, any soil organisms seem likely to be minimal by the time of this project.

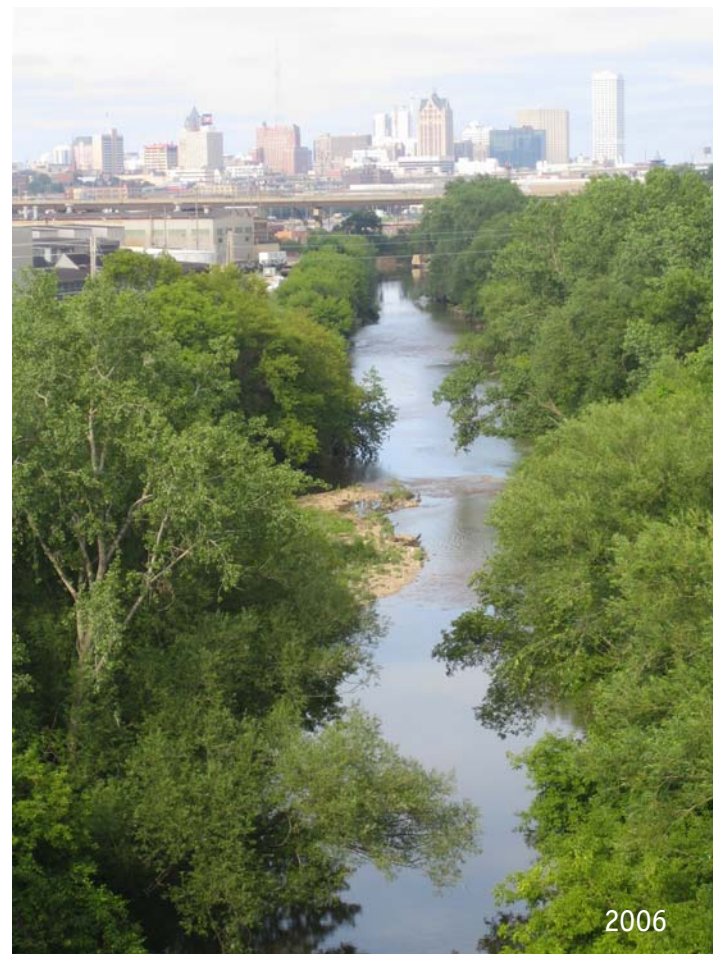
Groundwater zones and condition are at present unknown, but will be tested soon.



In the earliest US Dept of Agriculture aerials of 1937 (left, above), the relatively depauperate riverbanks can be discerned, as well as the lack of buffer habitats.

In 1999 (left, below) the former landscape of Airline Yards is visible, largely turf at the elevation of the former rail lines. The narrow sheetpile edge along the north bank at Falk is visible.

RESTORATION CONDITIONS AND OPPORTUNITIES



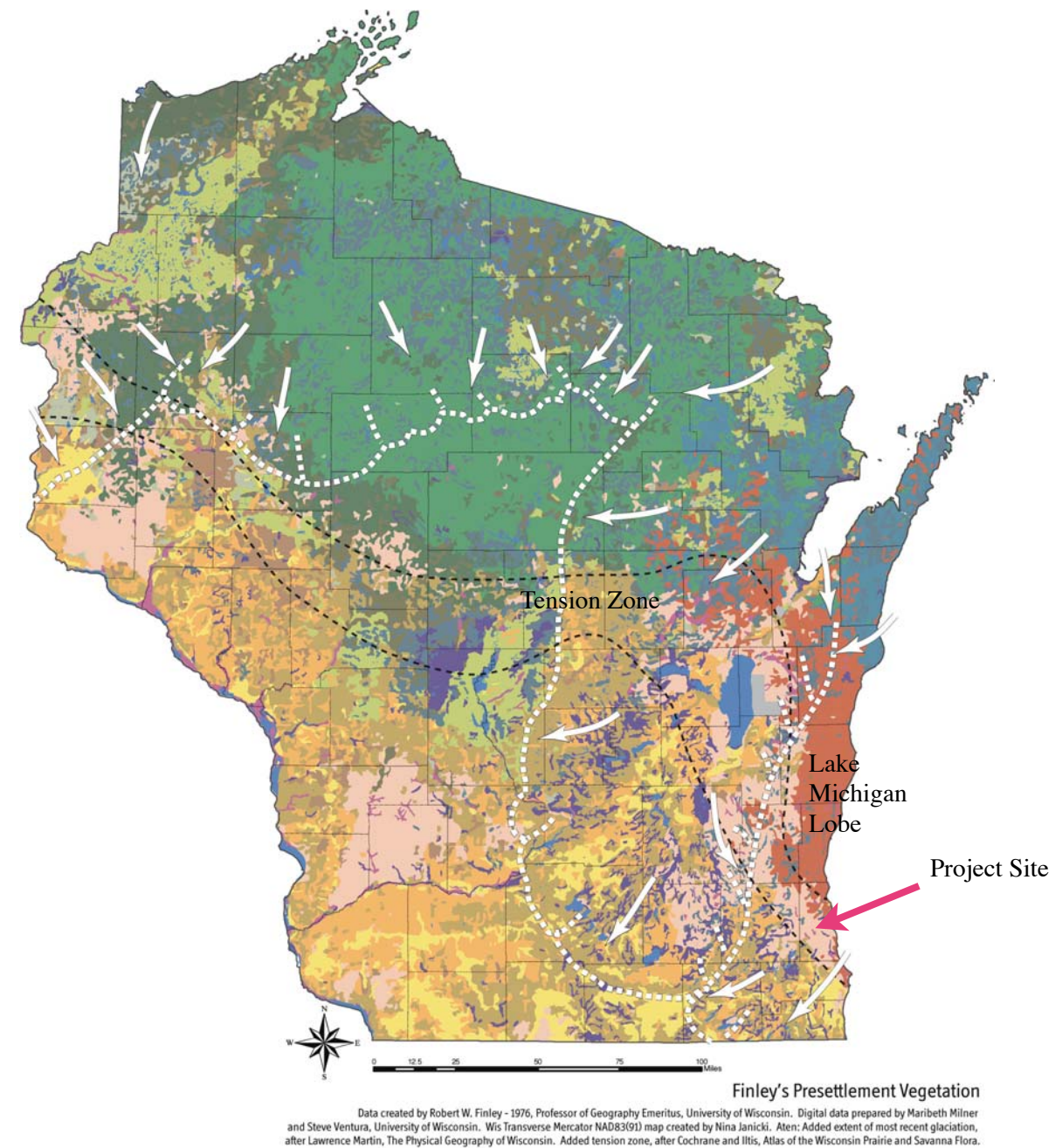
Above: our river just upstream of the Project Site, in 1908, and the present day river corridor of Airline Yards. Just past the edges of this photo are industry and lands barren of vegetation; the value of the mature native tree canopy even in the narrow river corridor should be clear: imagine being a bird :).

The project goals for landscape restoration are both poetic and ecological. They are long-term (hundreds of years) and also contain short-term goals (native prairie cover in a few years). In a qualitative sense, the goals for the restoration effort have been articulated by stakeholders as the notion of creating wilderness in the city. Ken Leinbach, executive director of the Urban Ecology Center (UEC) has noted the importance of this particularly given the lack of undeveloped land in Milwaukee (including over-developed park land). In the July 2007 visioning workshop, stakeholders described a place that would be “... not like any other park... access to river, interesting vistas... like a laboratory: can discover and find things... variable geography and topography... lower floodplain as much as we can... provide biota refuge spots along the river... dramatic changes in small spaces... with a great expression of Southeastern Wisconsin biodiversity.”

The Urban Ecology Center: “[We are carefully assessing...] the challenges and the opportunities of environmental education in the midst of one of the state’s largest ecological restoration efforts. Wetlands, prairie, oak savanna, and forest will be created from former rail yards, restoring native species that had once inhabited the Valley... opportunities are tremendous: education that is participatory in large-scale environmental restoration... At the same time, the remarkably resilient river already harbors pockets of 80-year old trees and river edge with herons, frogs, and fish, that will support learning.”

The largest constraint to the restoration effort is the quantity of fill to be accommodated on site, and presently stockpiled there. This condition is related to the larger goals of the project, which balanced economic and environmental needs. The larger project provided a “stormwater treatment train” on land on the north side of the river and some degree of hydrologic connection allowing the river to overtop its bank there in high flows, but traded off the accommodation of fill in the Airline Yards area. This is a given condition. An accompanying concern is the known absence of native soil, and the typically severe soil compaction accompanying earth-moving work.

The Wenk Concept Plan proposes the rebuilding of mounds, to reflect a glacial configuration that could have occurred at this site. The mounds will be separated and spatially disjunct from the remaining Valley bluffs by the active rail lines. This new condition provides great topographic variation in site conditions, one important factor in allowing the opportunity for maximizing reasonable local plant community biodiversity, which is a goal articulated by the Urban Ecology Center to increase learning opportunities. The result should be a landscape that is both grand in scale/vista but intimate in detail/experience.



The proposed glacial model considers conditions in the area near the margins of the most recent Lake Michigan Lobe. NE -> SW was the approximate direction for ice flow here. All of the glacial forms proposed (drumlin, kame, esker, kettle, recessional moraine) can be presently seen within 20 miles of the site, according to Tom Hooyer, UW-Milwaukee. Tom also notes the importance of river terraces as the most logical representation of natural history, and that the Valley was cut when Lake Michigan at a much lower level than today.



“314-09: Landsat mosaic of Wisconsin and adjacent parts of Minnesota and Iowa. Note that the lakes and moraines in the Green Bay Lobe are clearly shown from space.” The Lake Michigan Lobe is visible as well, and shows the ice flow direction from northeast to southwest in the vicinity of Airline Yards. (Maher 2001-2004)

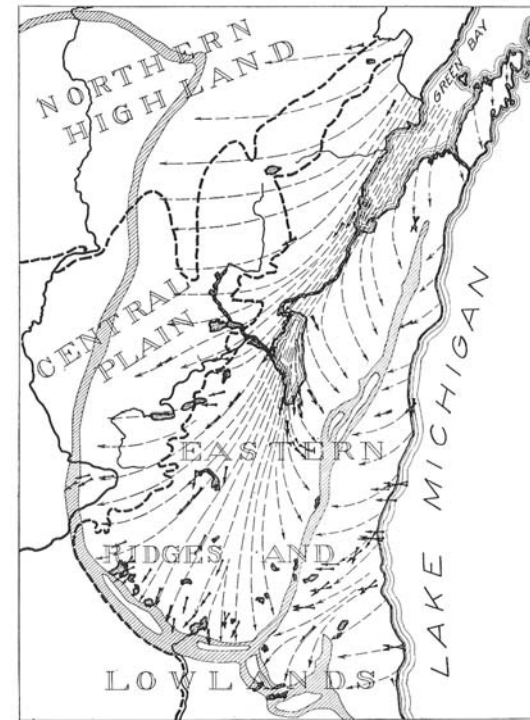
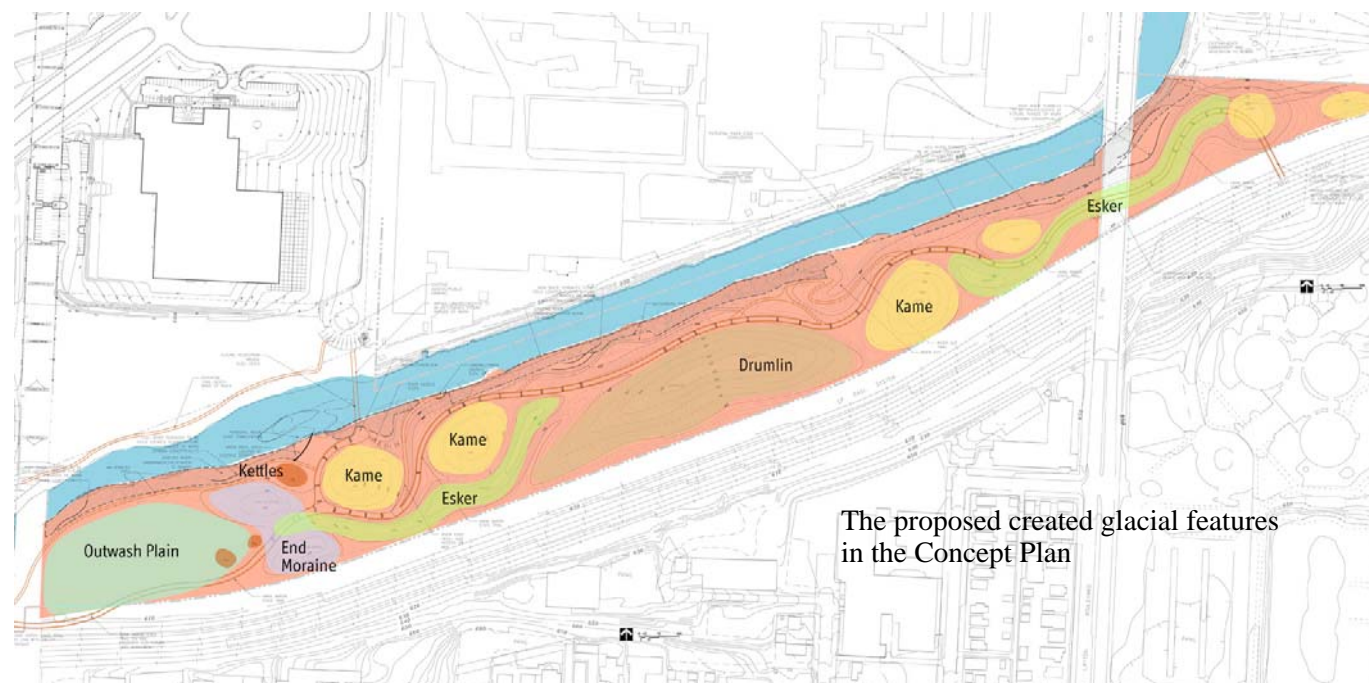


Fig. 79. The Green Bay lobe and Lake Michigan lobe of the continental glacier, with arrows indicating the direction of glacial advance. (Modified from map by Alden.)

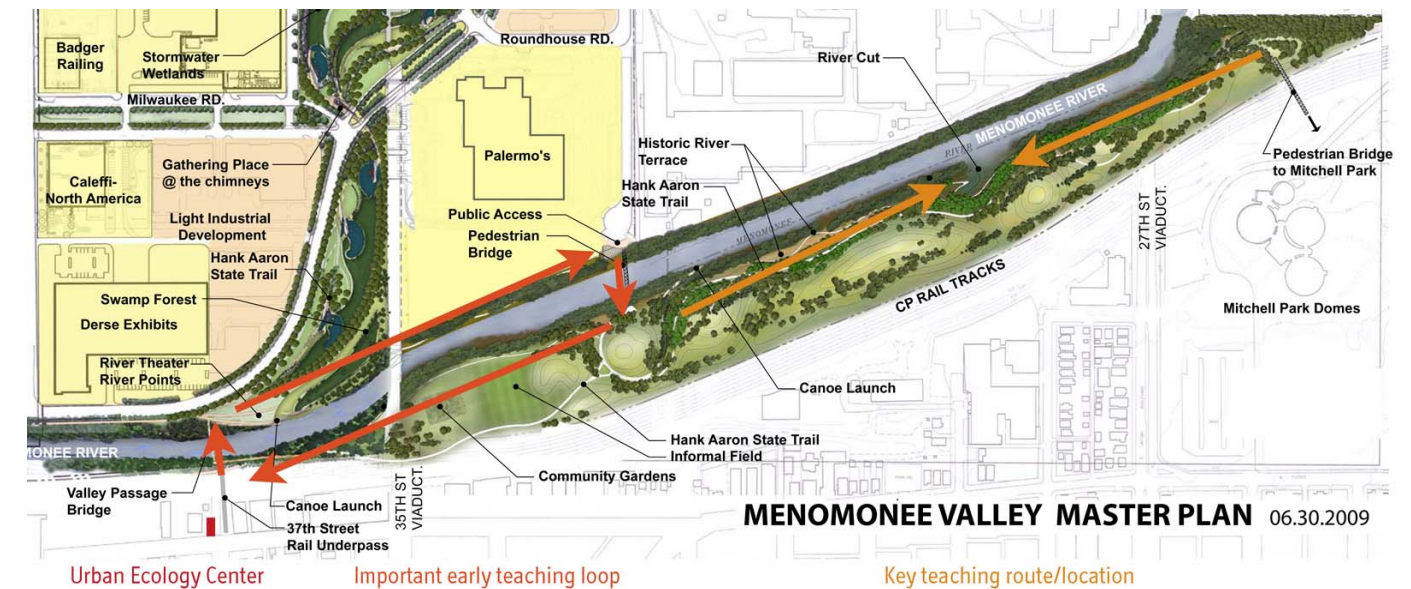
Above: Lake Michigan Lobe and direction of ice flow (Martin 1965)



The proposed created glacial features in the Concept Plan

The glacial forms proposed raise conceptual and practical questions related to vegetation restoration. This is not the landform historically present on the site; the gap of the low-elevation railroad corridor between the proposed glacial forms and the historic bluffs to the south is an obvious landscape disconnect in the “glacial story”. How far should this story be taken, in the context of maximizing teaching opportunities? Soil composition and structure is one obvious factor in telling the story. In one sense, no matter what we do (on the spectrum of glacial truth), it’s teachable. On the other hand, the opportunity to incorporate soil composition and structure and its interaction with vegetation types seems worthwhile (if it can be done, given the fill volume constraints). Soil structure, composition, and hydrologic conditions limit the range of natural plant communities that can be eventually sustained.

Along with the glacial forms starting from bare, depauperate ground - is the existing riverbank corridor. Discussions with UEC teaching staff have noted the importance of the existing vegetated riverbanks as early teaching habitat. The loop along the river closest to the UEC facility, provided by the bridges at Valley Passage and at 33rd Court, will be an important educational route. The river cut is anticipated to be a key study area for older students, including the opportunity for highly diverse habitats in a small area. In addition, the idea of participatory restoration, through the UEC’s community programs, is clearly a key idea for the success of the restoration effort, and an influence on the development of restoration plans that can maximize the mutual benefits (to both education/community and to the ecology of the site).



The general ecological restoration goals, in the terminology of the Society for Ecological Restoration, can be summarized as:

- (a) Recovery of the damaged and degraded riverbank habitat. Although the riverbank is also highly altered from historical conditions, it does represent a source of renewal and a functional riparian corridor for the river as it has flowed for eighty-plus years.
- (b) Transformation of the rest of Airline Yards from altered conditions to a range of native plant communities that historically existed in the vicinity. The altered conditions include the historical filling of the marsh and floodplain, to the more recent brownfield condition of the abandoned railroad. The project site conditions, as well as planned human use, may mean that the relative dominance of each plant community will not reflect historic conditions of the nearby area, but the overall intent is a balanced ecosystem that incorporates the riverbank habitat, maximizes native plant community types and the biodiversity within each plant community, and has a reasonable degree of sustainability. Biodiversity goals include a recognition of the value in including ecosystems that, although historically a small portion of the landscape, are now rare, such as oak savanna and biodiverse prairie. The sustainability goals are tied to the abilities of the DNR and the Urban Ecology Center to manage the landscapes with anticipated resources perpetually.

PROCESS CONDITION FACTORS

For the riverbank and planned river cuts, the **flashiness** of the river presents a significant challenge to the recovery and establishment of sustainable plant communities.

For the transformation to prairie and savanna, the ability to re-initiate prescribed **fire** will need to be considered. Ability to eventual permit prescribed fire on this site should be discovered in the near future, although previous indications are that it would be possible via the WDNR and supported in principle by the City of Milwaukee Forester. The planned areas should be consistent, even in these artificial conditions, with how fire would carry and should be conducted, and with natural and constructible fire breaks.

There may be **relative drought** conditions to be considered, primarily related to vegetation establishment (discussed further below).

The topography will allow a **range of moisture conditions** based on aspect and on surface drainage. The Wenk Plan proposes the creation of a backwater cut into the river bank and possibly terraces that could allow for the creation of occasionally-flooded saturated areas. In addition, the groundwater levels are presently unknown, as is the groundwater quality. Conditions could possibly provide seep opportunities, or could complicate excavation possibilities.

Topographic variability is an important factor enabling landscape heterogeneity and the opportunity for maximizing reasonable local plant community biodiversity. The created glacial forms provide variability in slope, aspect, and potentially soil profile. South-facing slopes get more sun and tend to be drier. In our climate, this tends toward supporting prairie and savanna landscapes rather than forests.



In these kames, the south aspect is on the right, with more open landscapes.

“133-28: Moulin Kames, Kettle Moraine, 4 miles northeast of Dundee, WI. View to east.. (18May66)”



This glacial landscape illustrates variation in forest cover related to slope aspect as well as exposure protection.

Martin, The Physical Geography of Wisconsin, 1965

B. STEEP RIDGES OF THE KETTLE MORAINE NEAR EAGLE. Airline Yards Landscape Restoration Concept Plan

The simple condition of slope aspect, particularly with the steep slopes proposed, is a determining factor in potential vegetation.

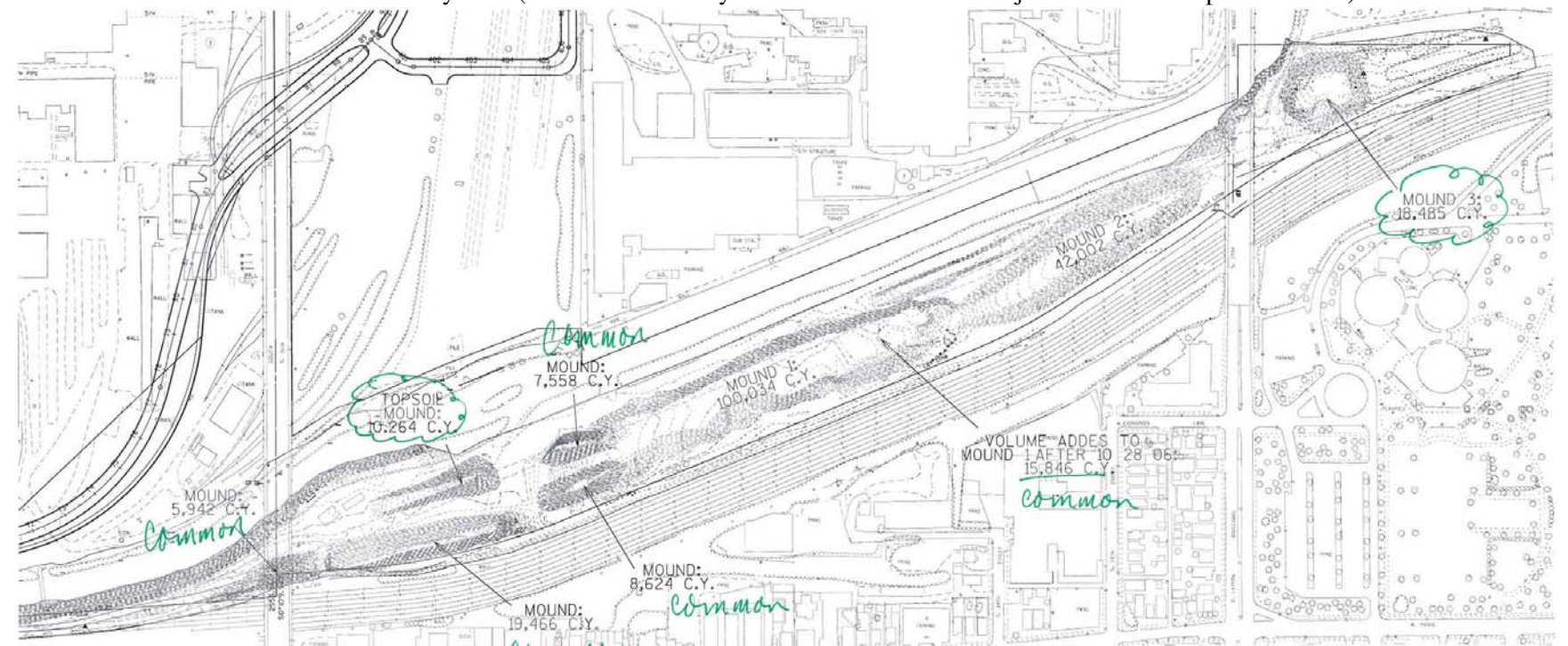
Soils:

The riverbank soil, although presumably comprised largely of historic fill as the river channel was historically relocated and marshland filled, will be untouched for most of the site, and does carry an 80-plus-year history of revegetation. (The riverbanks do include rubble from old bridge abutments and other dumping). The mounds, on the other hand, will be comprised largely of clay fill and a degree of rubble from offsite from the Wisconsin DOT Marquette Interchange reconstruction project.

Kames and eskers are composed primarily of sorted material, primarily sand and gravel. (As eskers were flowing rivers, cross-bedding or the “wave” character of the material can occur). In kames, coarser deposits of sand and gravel in the stratigraphy can have the effect of seeps. The project will need to accommodate the provided fill, probably without room for adding sand and gravel in any significant quantity. The inclusion of supplemental sand and gravel deposits, if feasible, could potentially provide the opportunity for seep plant communities.

Drumlins and recessional moraines are undifferentiated material, glacial till, ranging from clay to boulders (glacial erratics) and unsorted. Geologist Roger Kuhns thinks that it’s nearly impossible for humans (and equipment) to produce unsorted mounds: the way equipment moves and dumps soil is too different from the way ice moved material (personal communication). The clay and a range of dissimilar material size including limestone boulders and glacial erratics in the mounds can be provided, within the limits of bringing in little additional material.

The below survey described the end-of-stockpiling condition in June 2007. Note the stockpiled “topsoil” (City of Milwaukee Forestry source), which has indeed had a substantial weed cover in the intervening years. (The current nursery in Airline Yards is located just east of the “topsoil” mound).



Summary

Common cover	57,436 CY	mound 3	18,485 CY
topsoil	10,264 CY		

DRAFT
June 19, 2007
AN
MTP



Stratified alluvial soil of an esker.

Transverse section of the Waterloo esker, showing the anticlinal dip of the stratified beds. Looking south. Frank Langer's gravel pit. SW 1/4, sec. 6, T. 8 N., R. 13 E. Waterloo quadrangle. Jefferson County, Wisconsin. September 1903. Image 81, Alden, W. C. U.S. Geological Survey.



Unstratified undifferentiated soil of a drumlin.

View of north side of road cut through long, narrow drumlin, showing the structureless till composing the hill. SE 1/4, sec. 21, T. 9 N., R. 14 E. Waterloo quadrangle. Dodge County, Wisconsin. 1903.

The outwash plain west of the recessional moraine in the Concept Plan provides another opportunity for vegetation biodiversity if we can initiate the soils -- from boulder-strewn, drier, sandier soils at the outlet to the finer-grained less-draining richer soils away from the outlet.



An example of an "outwash plain and front slope of moraine", similar to the conditions the Concept Plan suggests at the west end.

Rock County, Wisconsin. July 20, 1910. Image 463, Alden, W.C. U.S. Geological Survey.



Note the boulder-strewn nature of the moraine (absence of forest is likely cultural). These surface-boulder conditions could be similar to those suggested by the Concept Plan near the west end.

"133-21: Moraine in the Kettle Moraine, Fond du Lac and Sheboygan Counties, WI. Boulders remain inside the pasture fence, but they have been removed from the fields. View to southeast. (18May66)" [maher@geology.wisc.edu Copyright © 2001-2004 Louis J. Maher, Jr.; noncommercial educational use allowed]

The old river terraces to be field-located in the Concept Plan may be another opportunity to correlate vegetation as it would have developed in the flat, siltier soil of the terraces.

A reasonable condition for kettles, as planned near the recessional moraine, would be saturated peaty/organic soil underlain with clay. It will be a usefully interesting vegetative condition to have kettles that don't drain well. From Tom Hooyer: "When most kettles are formed, they are simply in glacial outwash usually consisting of sand and gravel. However, with time the kettles fill up with fine-grain sediment (clay and silt) from slope wash and creep or surrounding hill slopes and eventually organic material as slopes stabilize (shortly after glaciation). In fact, in most vegetated landscapes like those in Wisconsin today, the sedimentation is due to organics because the transport of fine-grain sediment from slopes to kettle is captured/stabilized by vegetation."



Configuration of kettle at right rear, near esker, is similar to conditions suggested in the Concept Plan. Note the unforested version of kettle. In the interests of maximizing diversity, UEC has suggested we consider both a forested kettle and an unforested one.

"175-10: Parnell Esker and a kettle lake (marsh), 3 miles northeast of Dundee, WI. View to the NNE; northeast 1/4 Sec 20, T14N, R20E, Kewaskum Quad. (4May67)" [maher@geology.wisc.edu Copyright © 2001-2004 Louis J. Maher, Jr.:

The clearest opportunities for vegetation biodiversity relate to topography (and the corresponding slope aspects) and microtopography in grading; further, the re-creation of soil structure and additional information on hydrology will fine-tune opportunities as well.

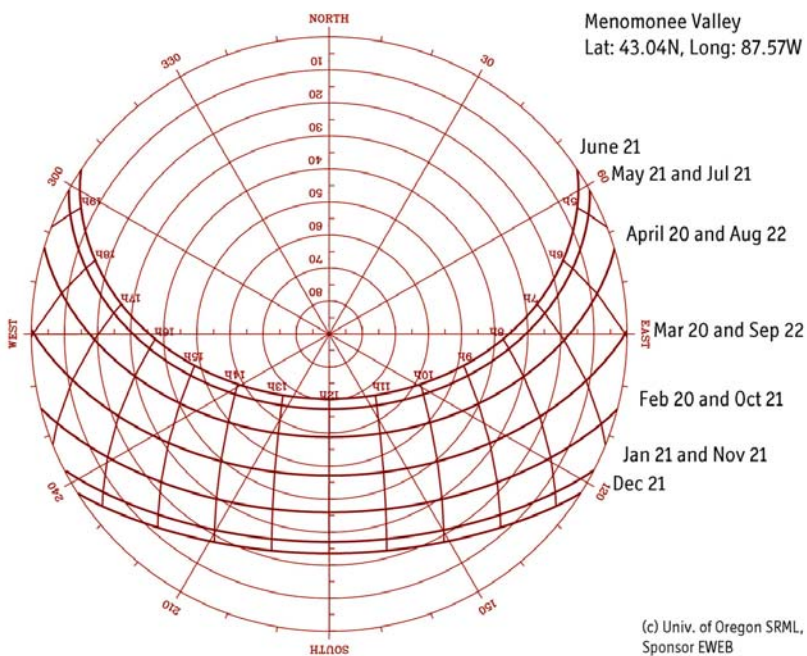
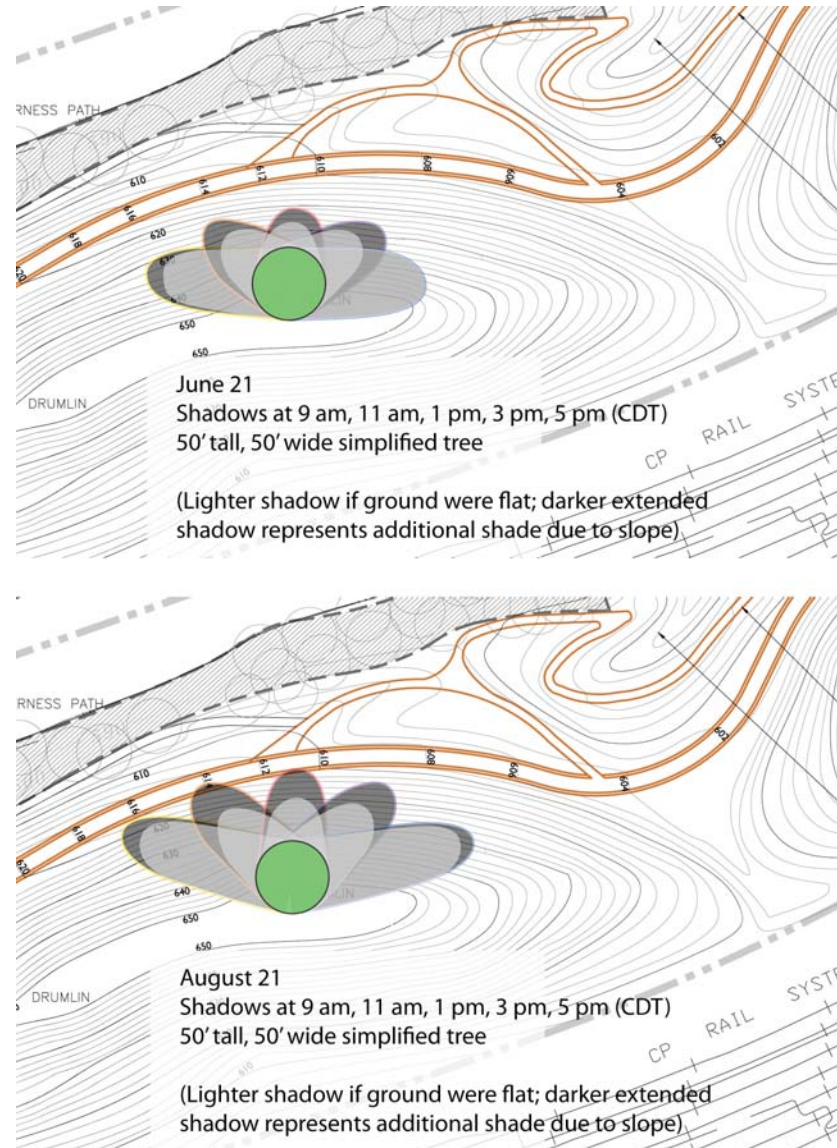
Sunlight:

The proposed topography also creates sunny south-facing slopes (without nearby tall buildings to block light) and shadier north-facing slopes and shadiest north-facing ravines, as well as intermediate variations. Slope aspects and amount of light directly affect moisture conditions and corresponding plant communities - even the potential for certain plant communities.

As an example, the proposed drumlin has quite steep, roughly H:V 2:1 slopes. On the north-facing slope of the drumlin, the shading effects of trees are extended. Even on the summer solstice, when the mid-day sun is at its steepest angle, the shadow cast by a tree down this slope is more than 50% longer on the ground. In August at mid-day when the sun angle has dropped a bit from its highest angle in June, the shadow cast by a tree down this slope is more than 60% longer. These effects are illustrated at right.

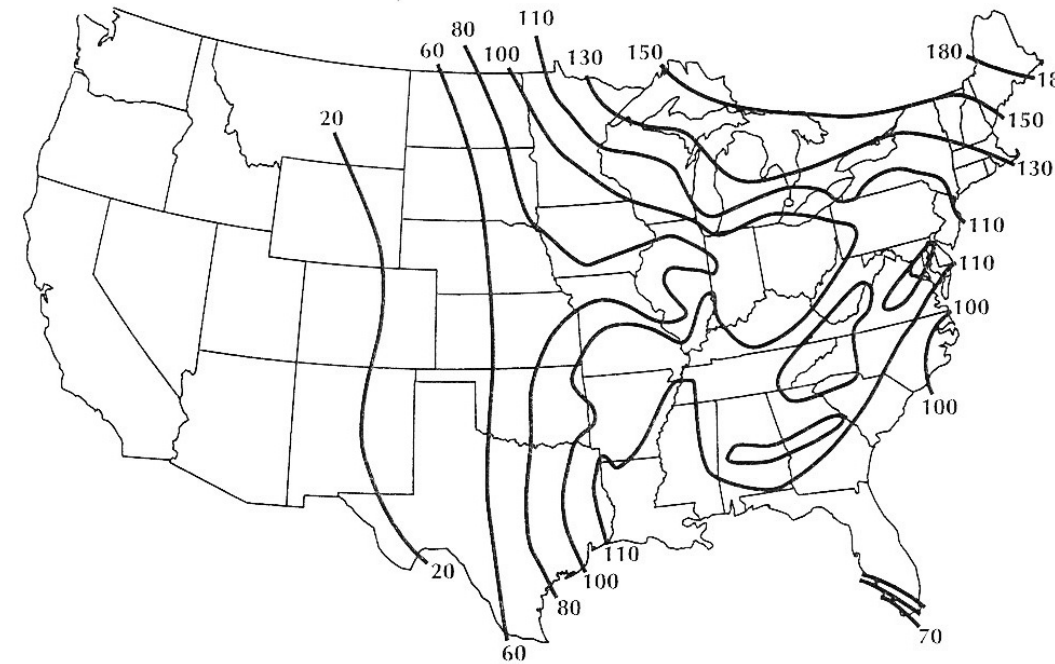
On north-facing slopes, the extent of shade cast by mature trees, even widely spaced, is on its own enough to make savanna flora difficult to maintain.

The slope itself (bare ground), at H:V 2:1, is not enough to itself shade the north-facing slope (by 8 am even in April the sun angle is high enough). However, even without trees, the increased local shading effects of herbaceous plants would be significant, enough it seems to challenge the restoration of prairie on north-facing slopes.



Rainfall:

Milwaukee has approximately 33-34" of annual rainfall. We are just over the Precipitation / Evaporation balance, tending to support forest communities (compared to the lower rainfall to our west and south, where prairies dominate). Being just at the balance is related to the fact that Milwaukee County has nearly 1000 native species, approximately half of the state's total, comprising several plant community types.



“Isoclimatic lines of precipitation-evaporation rates for the United States, which correspond closely to the distribution of the Prairie Peninsula flora.

From Jenny (1941)”.
Cochrane & Iltis, Atlas of the Wisconsin Prairie and Savanna Flora Technical Bulletin No. 191, 2000, WDNR.

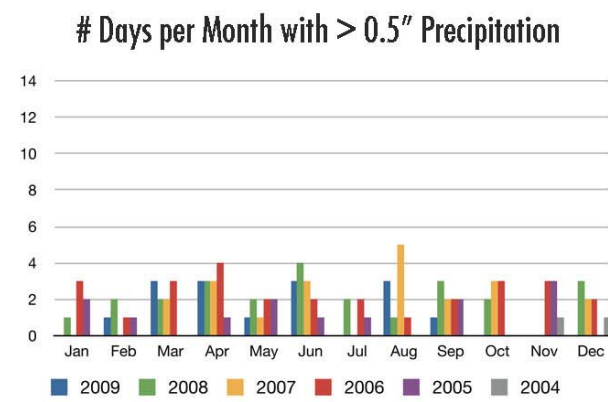
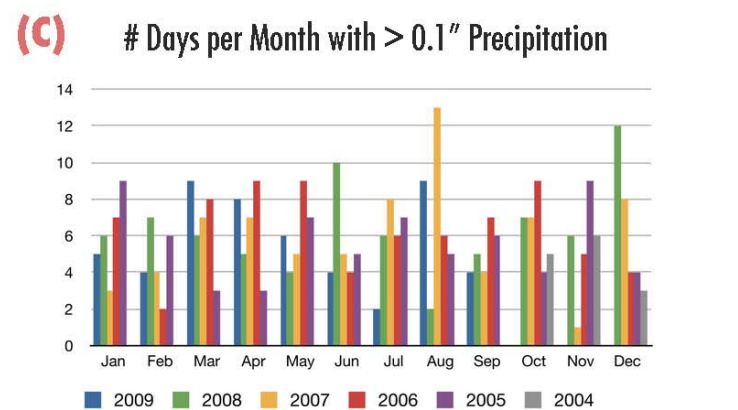
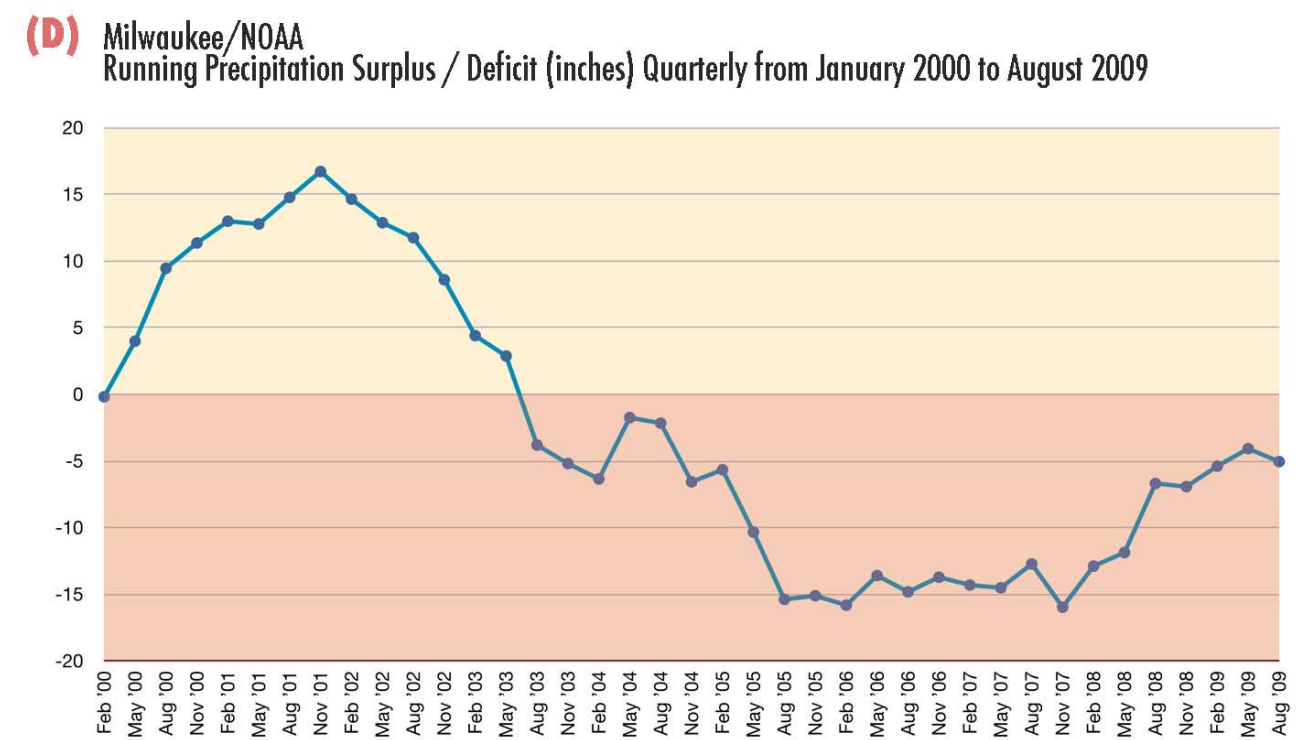
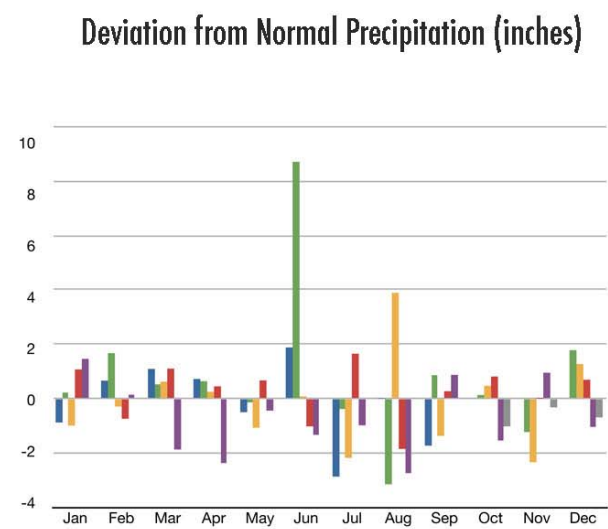
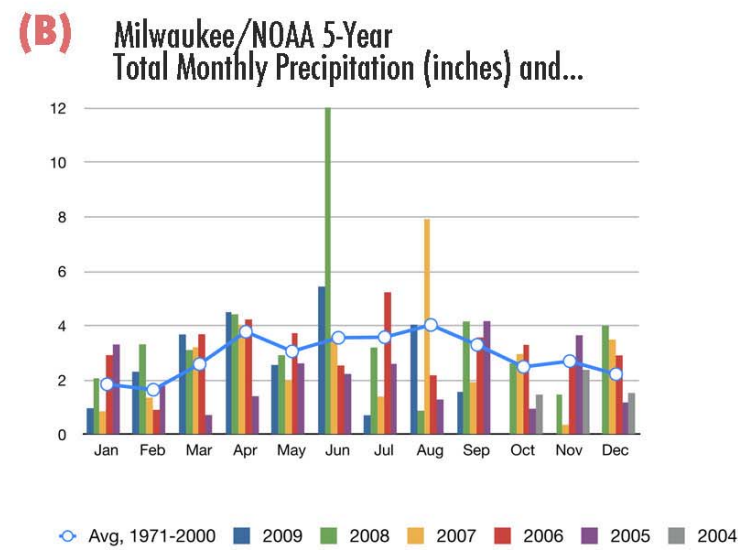
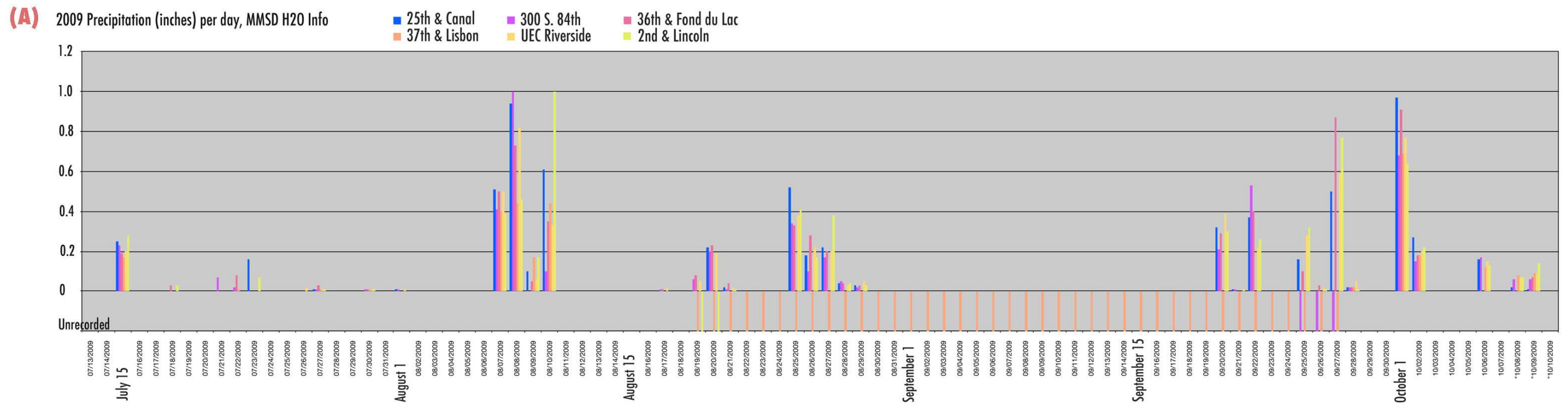
Rain charts are shown on the following page:

(A) Rainfall per day over the summer of 2009. This compares several stations in the vicinity of the Valley, beginning with one at 25th and Canal. A local Valley bias of drier conditions has been casually observed (speculatively connected to the effect of the large stadium parking lots). This isn't formally analyzed, but do note that when other gauges away from the Valley received smaller amounts of rain, the Valley seemed to more often than not receive none. In addition, note the extended gaps of no rain. Conditions like this could point to moisture-buffering restoration techniques, including microtopography (e.g. divets, furrows) that locally captures the periodic moisture to sustain soil moisture to a better degree during dry periods. Or, planning for alternative water sources in cases of extended dry periods.

(B) Monthly precipitation over five years (with average and deviation), and (C) numbers of days per month of at least a half-inch of rain, and at least a tenth-inch of rain, average in Milwaukee. Note summer deficits as well as periodic extreme events. These patterns should be considered in both range and type of restoration techniques. Average is average; restoration techniques must consider how to buffer irregular rainfall prior to the establishment of vegetation and roots that naturally buffer the moisture. For example, planting, as compared to seeding, requires certain levels of moisture from the start. Implementation plans might carefully restrict times of year and in some cases require micro-scheduling flexibility in planting when rain is forecast.

(D) Running surplus/deficit over ten years might indicate precipitation variation patterns over longer time scales.

All of these indicate care in restoration planning related to moisture needs.



(A) Note extended gaps of no rain. Note rain pattern at the blue station at 25th and Canal, closest to Project Site (orange station, 37th & Lisbon, was out of service for over a month).

(B) Note apparent pattern in the past five years of summer rain deficits, as well as periodic extreme events.

(C) Note the small number of days per month with solid rain (> half-inch).

(D) Quarterly running surplus/deficit for the past ten years shows broader variability.

BIOTIC CONDITION FACTORS

The larger project area is surrounded by railroad corridor to the south and industrial property on other boundaries, with little vegetation. Other than seeds carried by the river itself, the area is relatively isolated from weed sources (as well as from native seed sources). Mitchell Park on the east, situated across the railroad, is developed park land with little natural area other than some persisting native vegetation along the bluff. As a County Park, it receives some attention to invasive exotic management, but in any case is still significantly separated from the project area.

The river itself provides a perpetual weed seed source from upstream; ongoing management efforts on the first phases of re-grading and restoration on the upstream north bank for Reed Canary Grass (*Phalaris arundinacea*) and Purple Loosestrife (*Lythrum salicaria*) in particular, demonstrate this. Despite upstream weeds, there is recent restoration work upstream of the project area by the Wisconsin DNR, and plans for future work, that bode well for the future trajectory in the river corridor. Both species will remain a management issue in the Airline Yards lower riverbank.

On the other hand, Airline Yards uplands are relatively isolated from weed sources because of the adjacent railroad corridor and industrial areas. The illustration on the right characterizes the adjacent and surrounding landscapes in a coarse sense.

The native flora of the existing vegetated riverbank in the proposal area is much diminished in structure, cover, and biodiversity, with much reduced herbaceous layer and reduced understory, largely due to the common presence of Common Buckthorn (*Rhamnus cathartica*). The flora is presently a mix of persisting native species skewed toward ruderal species, with the usual assortment of exotic and invasive exotic species for this urban area.

Existing native tree species, many of them uncommon although still present on the site, include Green Ash (*Fraxinus pennsylvanicum*), Black Willow (*Salix nigra*), Cottonwood (*Populus deltoides*), American Elm (*Ulmus americana*), Slippery Elm (*Ulmus rubra*), Silver Maple (*Acer saccharinum*), Ash-leaved Maple (*Acer negundo*), Quaking Aspen (*Populus tremuloides*), Ironwood (*Ostrya virginiana*), Black Cherry (*Prunus serotina*), *Amelanchier* spp. Native shrub and vine species persisting on the site include Redosier and/or Silky Dogwood (*Cornus stolonifera*, *C. amomum*), Chokecherry (*Prunus virginiana*), Staghorn Sumac (*Rhus hirta*), Gooseberry (*Ribes cynobati*), Willow (*Salix* spp), Black Currant (*Ribes americanum*), Grape (*Vitis riparia*), *Rubus* spp. Some native perennial species are fairly common although patchy on the lower half of the riverbank, notably Violet (*Viola sororia*), White Snakeroot (*Eupatorium rugosum*), Goldenglow (*Rudbeckia laciniata*), Virginia Waterleaf (*Hydrophyllum virginianum*), Jewelweed (*Impatiens capensis*).

The willows, elms and ashes are already important to migratory birds in the spring foraging for insects. The dogwoods and wild grape provide fleshy fruits to those birds in fall migration.



Landscape Context

- Project Site
- Mitchell Park - Under County Parks jurisdiction; bluff areas appear largely unmanaged
- Railroad - Unvegetated
- Other Park Areas - Largely native species, management under DNR or compatible control
- Unmanaged Vegetation - Including invasive exotic species. No perceived ability to manage.
- Industrial Parcels - Largely unvegetated

Exotic woody species include the aforementioned Common Buckthorn (*Rhamnus cathartica*), Tartarian Honeysuckle (*Lonicera tatarica*), probably exotic willows (*Salix* spp), Black Locust (*Robinia pseudoacacia*), Tree-of-Heaven (*Ailanthus altissima*), European Highbush Cranberry (*Viburnum opulus*), Mulberry (*Morus alba*). The exotics are common but not fully dominant. They likely have had a substantial detrimental effect on the native understory and herbaceous species.

Lower parts of the riverbank, as already mentioned, have patches of invasive exotic Reed Canary Grass (*Phalaris arundinacea*) and Purple Loosestrife (*Lythrum salicaria*). Upper parts of the riverbank have a share of native, mostly ruderal herbaceous species, but also harbor garlic mustard and other invasive exotics. Near the top of the bank at the edges of the existing vegetation (adjoining former brownfield), the penetrating sunlight, stockpiled fill, and general disturbance of 2005-2006 is encouraging a troubling assortment of other invasive exotics including spotted knapweed, Canada thistle, burdock, and bindweed.

Invasive exotic control would typically follow Czarapata (Invasive Plants of the Upper Midwest: an illustrated guide to their identification and control, 2005, University of Wisconsin Press) and the Wisconsin DNR, <http://dnr.wi.gov/invasives/plants.asp>. The most problematic weeds in our proposal site are also those with well-established, effective control techniques.

Early management of these landscapes, and removal or vast reduction in the exotic seed source, is crucial to the success of the vegetation restoration of the whole project. Supplemental planting of selected native woody and herbaceous species can then fill gaps and aid in soil stabilization, and by choices of species, increase the native biodiversity and improve food and habitat for migratory and nesting birds. The soil is highly altered and although it surely contains recent seed source, does not likely harbor a large diversity of native species (that might reflect pre-settlement conditions) in its seed bank. Thus, active restoration in the form of planting native species of appropriate ecotype is necessary. However, there is a balance to be struck to protect genotype of existing native species and those likely to be present in the seed bank, and hence a preference to supplementally plant site-appropriate native species not generally already present. These might include, in the lower bank, Buttonbush (*Cephalanthus occidentalis*), Common Elderberry (*Sambucus canadensis*), and in the upper bank, Black Cherry (*Prunus serotina*), Maple-Leaved Viburnum (*Viburnum acerifolium*), Arrowwood (*Viburnum rafinesquianum*), Hawthorn (*Crataegus mollis*), Virginia Creeper (*Parthenocissus quinquefolia*). In considering supplemental herbaceous planting the same genotype concerns apply, and we might plant in patches, balancing erosion control needs with desire to watch for the response of the native seed bank. These particular riverbanks have a modest contribution to erosion at present, which is largely due to depauperate native species cover and structure, as well as the flashy scour in the lower riverbank. Strengthening the root density and soil-binding capacity will minimize the erosion that does exist. Any supplemental planting in the lower riverbank would focus on areas where slope variability and established vegetation allows some protection from flashy scour. (Revegetation of areas of significant riverbank modification such as the planned river cut are a separate topic of discussion).

The steepness of the riverbank creates challenges in the incorporation of volunteers in this work, although we certainly would want to continue and expand our volunteer corps. Although the site is difficult to reach at present, the completion of the Valley Passage bridge in 2010 will provide important access particularly for volunteers on the project.

Monitoring experience and practices in earlier phases of the project should continue and expand. Annual records should be kept of species and areas receiving seed and plants; annual species inventories conducted, and repeat photography continued to be used informally to assess progress (see <http://picasaweb.google.com/nancyaten.renewthevalley>). We should design and establish vegetation sampling transects through key restoration zones, designed to assess changes in species biodiversity and degree of cover of invasive exotic species, to guide ongoing management efforts.

The river corridor is important for fauna, including migrating as well as nesting birds. Although not a focus of the vegetation restoration plan, opportunities to enhance diverse fauna habitat throughout the site will be considered. E.g., planting of high-value food source species (for insects, birds, mammals...) prioritized early in the restoration phases or as more mature plants. E.g. the use of woody debris and (perhaps artificially installed) snags as part of the restoration, to provide nest and den habitat for small mammals and certain birds. And, sometimes the fauna can directly aid or facilitate the restoration goals. One example is early planting of fleshy-fruited native shrubs which birds can help disperse.

ECOSYSTEM RESTORATION GOALS

As previously stated, our goal for the bare-ground-to-natural-area is a balanced ecosystem that incorporates the riverbank habitat, maximizes native plant community types and the biodiversity within each plant community, representing pre-settlement natural history of the area (although not of the exact site, which has been substantially altered).

Implementation of the LRP will provide ecologically young landscapes having species compositions reflecting reference models (following this section), that have appropriate functional groups present, signs of normal ecosystem function (as measured indirectly through biomass, cover, seed production, vegetative reproduction, plant vigor), and that have self-sustaining and self-organizing characteristics. Our reference models are regional ecosystems that occupy a similar landscape position with similar physical site requirements to our altered landscape. Perpetual ongoing management post-restoration is expected, in this landscape severed from much natural landscape context.

At the same time, our goal is to provide wilderness in the city to maximize learning opportunities through the UEC's environmental educational programming, as well as to enable community participatory restoration.

Restoration planning is founded on anticipated projection into the future. We are restoring to the future, not recreating the past. The altered conditions here mean particular uncertainty of trajectory, and assessing the restoration is based more on whether it has attributes of a healthy natural ecosystem than on whether particular endpoints are attained. "An agreed-upon trajectory and its projection as embodied in reference model serve above all as signposts, yardsticks, beacons, and where needed, foghorns to indicate that the ecologically young system has self-sustaining and self-organizing characteristics and that the shared goals of the people who have agreed to work together to achieve holistic restoration are being followed and respected. [...] The value of restoration lies more in the process of redeeming a mindset of environmental sanctity than in reassembling a rigidly prescribed target". (Clewell 2007).

We will restore to the following community types. These form a mosaic of community types on a landscape continuum, rather than clearly disjunct patches. Within these communities will be additional specialized sub-types supported by microclimate conditions (discussed in Restoration notes below).

Dry Prairie - on south-facing slopes, on glacial features of more well-drained soil. Composition of 40-60 species anticipated.

Mesic Prairie - on south-facing slopes, on less well-drained soil. Composition of 60-80 species anticipated.

Black Oak Savanna - in the interests of maximizing habitat diversity, on a small scale due to sandy soil requirements.

Oak Savanna - canopy trees are predominantly bur oak and white oak, soil is richer than black oak savanna.

Southern Dry Forest - oak/hickory open forest. Decades to mature trees.

Southern Mesic Forest - sugar maple/basswood forest primarily on north-facing slopes. Decades to mature trees.

Long time periods for soil that will begin to support diverse forest understory.

Northern Mesic Forest - as a relict community in a protected north-facing slope and cove. In the interests of maximizing habitat diversity.

Riparian Forest - enriching and in some areas extending the existing riparian forest on the riverbank.

Shrub Carr - anticipated as part of the river cut, if terraces have a hydrologic connection through flooding or through groundwater and soil structure that can hold moisture.

PRELIMINARY CONCEPTUAL PLANS

On the following three pages are conceptual drawings of Airline Yards.

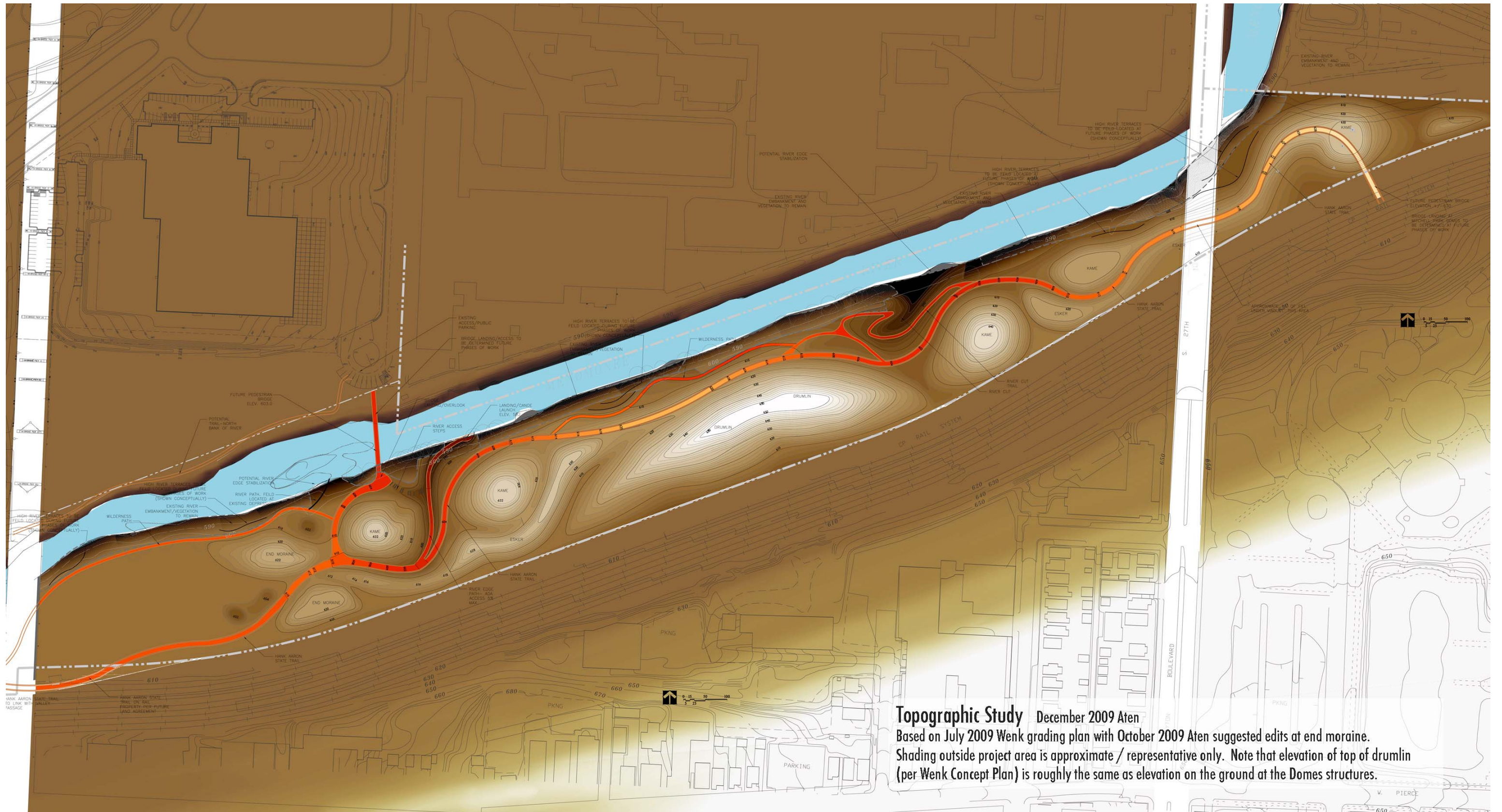
First, a topographic study to visually aid in the understanding of the proposed grading plan in steepness and in relative elevation. The color spectrum is uniformly applied from black near the river's base flow, to white at the top of the proposed drumlin (an elevation change of approximately 65').

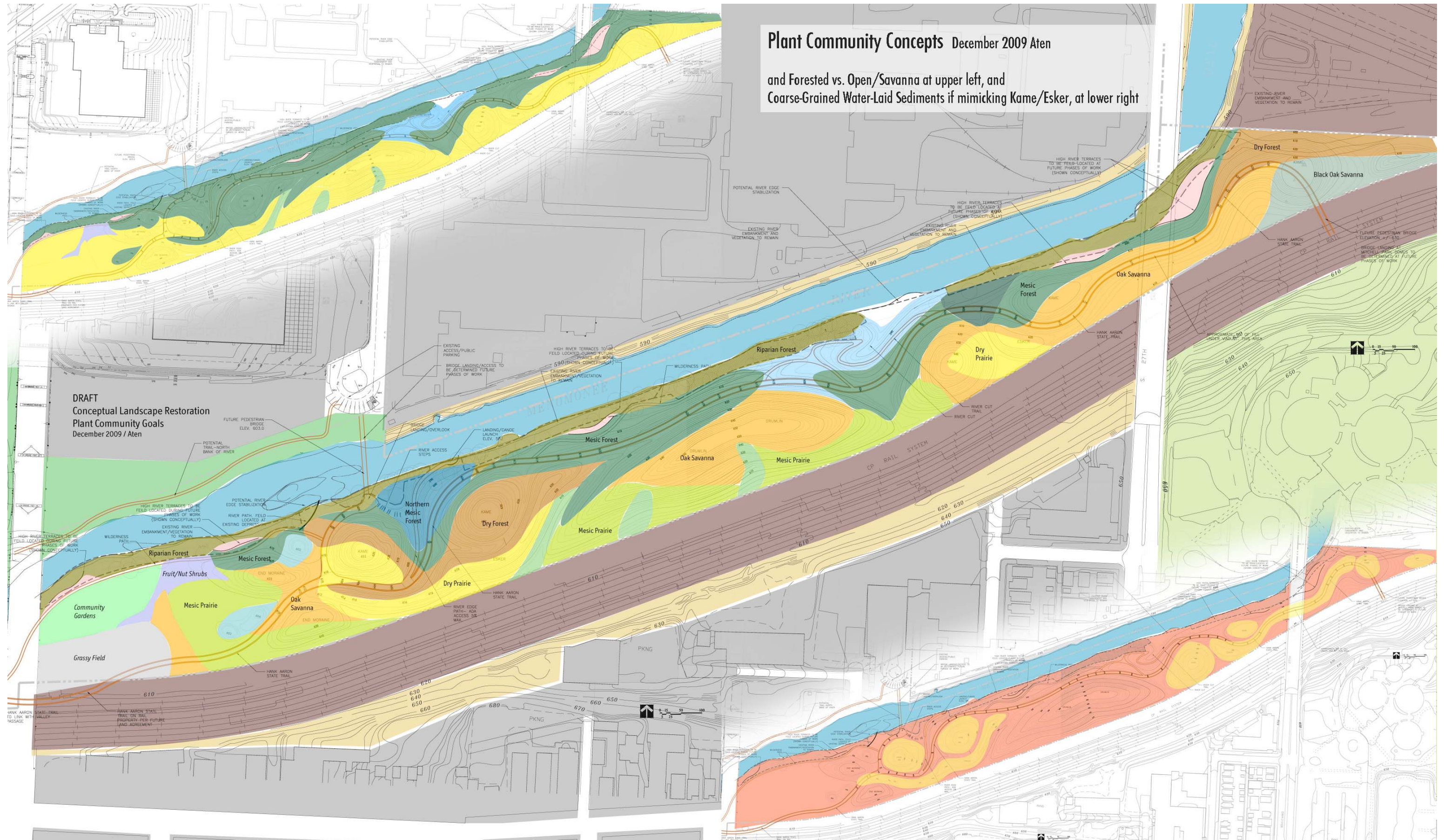
Second, a mass-space study considering vistas and trail experience. From the general conditions supporting forested north-facing slopes and open south-facing slopes, and the siting of the main trail, this study suggests mature tree massing patterns. Indications of possible vistas along the trail and from atop the drumlin are shown. Backlit leaves are an important part of the "visual essence" of prairies, and this study considers where those opportunities are most achievable for the trail user, and how the restoration plan can support this. The "prospect-refuge" idea, especially of a trail through a forest that comes across views to sunlit openings beyond, can also be supported by the restoration plan. In addition, vistas from higher elevations toward downtown and toward wilder areas of the river corridor have been noted by stakeholders as important.

Third, a preliminary plan of natural plant communities, based on the ecosystem restoration goals. The plan considers the abiotic and biotic conditions previously discussed, particularly slope aspect and topography. It presumes the correspondence of glacial form (and its typical soil structure) to appropriate plant communities. For example, the coarser, less fertile, and more well-drained soils of the kames and eskers, and portions of the moraine and back edge of the outwash plain, would naturally support drier communities. The forward portion of the outwash plain and the drumlin support mesic communities. The north-facing ravines and north-facing slopes support mesic and forested communities.

In smaller inset views on this third plan are, first, an overlay simplifying the proposed communities into forested and non-forested types. This is an important consideration for implementation and management. The management of open communities in the long term will typically include prescribed fire, or processes (e.g. mowing) that can mimic many of the effects of fire. The establishment of forested communities includes special attention to protection of young trees from herbivory and from local drought, while still requiring weed management techniques. Understanding the mosaic of communities from a management perspective is one factor influencing the restoration plan.

The other inset view on the third plan is an overlay of proposed macro-scale differences in soil composition correlating to the proposed glacial features.





Plant Community Concepts December 2009 Aten
 and Forested vs. Open/Savanna at upper left, and
 Coarse-Grained Water-Laid Sediments if mimicking Kame/Esker, at lower right

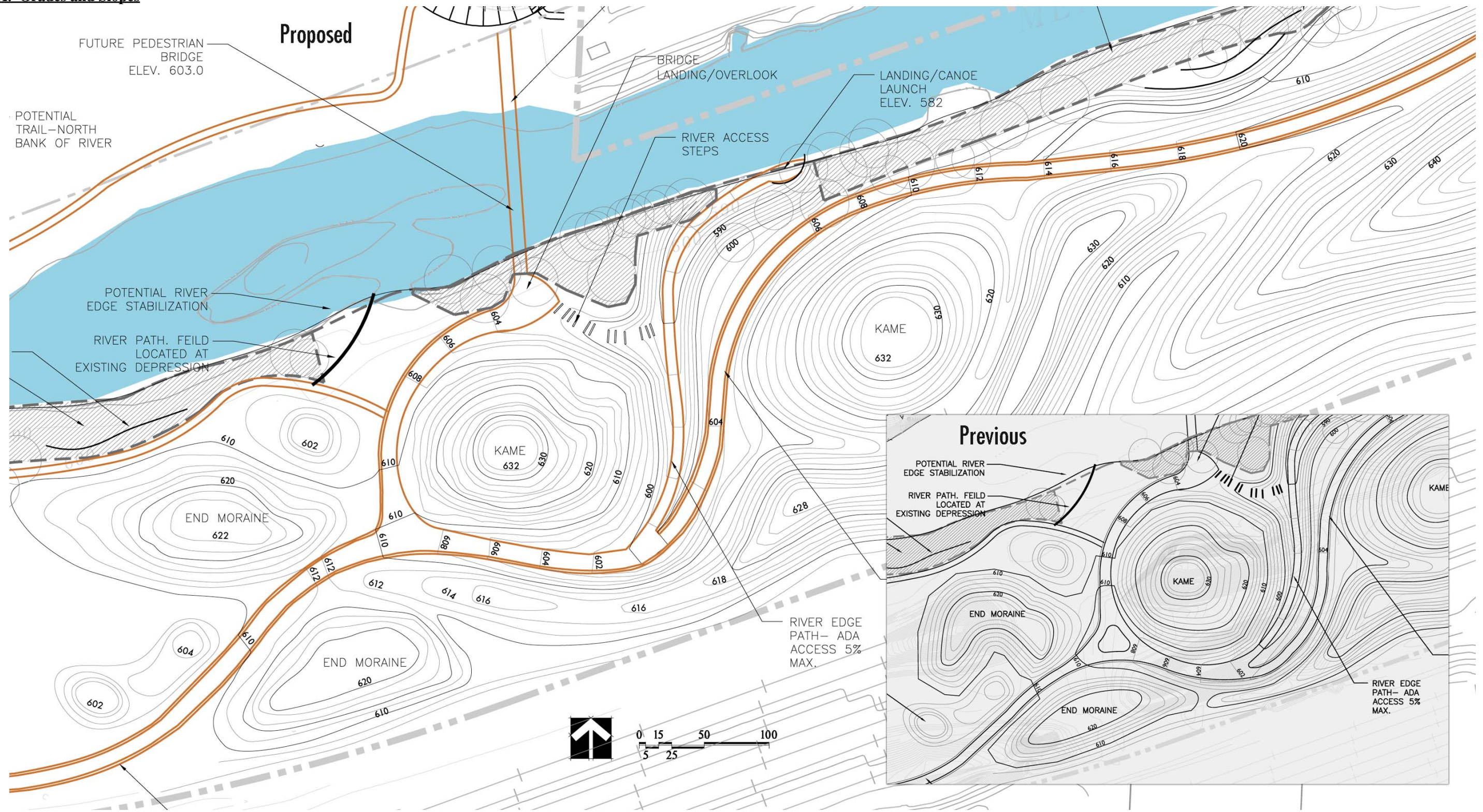
DRAFT
 Conceptual Landscape Restoration
 Plant Community Goals
 December 2009 / Aten

RESTORATION CONSIDERATIONS AND INTERACTIONS

This section discusses considerations that are influencing development of the detailed restoration plan, and particularly those that interact with the design work of the VPII team. These considerations are organized by category.

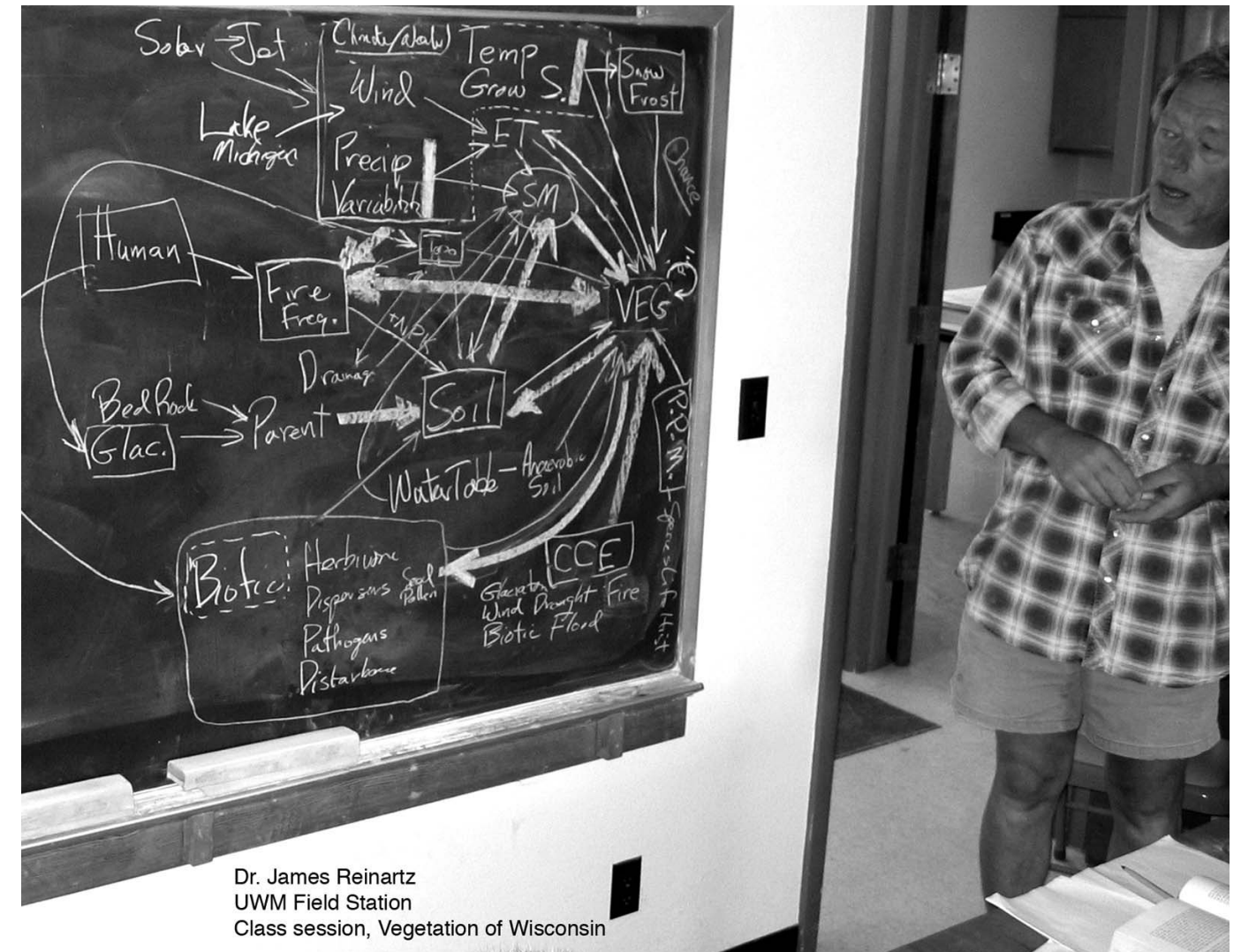
A. Grades and Slopes

(A-1) Suggested grading changes at west end to more correctly model glacial features, as proposed, an esker emptying through the end/recessional moraine. In a way, it's a subtle grading difference, but perception difference is significant. This allows the possibility to develop landscapes that are consistent with what a glacial outwash plain would have been like, and to help this be teachable.



(A-2) Slopes like ours have natural models hosting prairies, savannas, and forests. This oak savanna (top left) is in the driftless area of Wisconsin, so slopes are primarily determined by underlying bedrock: different than our conditions. But they do reflect slopes that savannas are comfortable growing on. The forested slopes are near the Milwaukee River Floodplain Forest SNA in the northern Kettle Moraine (top right) and along the Parnell Esker (below left and right).

Of concern in implementation, that will influence the plan, are erosion potential in the early phases, and also the ability (to be determined) of low-impact equipment for ripping, disking, seed-drilling, and mowing, that is able to navigate the slopes.



by soil moisture, soil pH, and soil organic matter. Soil preparation is also complicated by the different soil textures desired in different glacial formations, as discussed earlier. In addition, minimizing soil compaction will be crucial for the vegetation (while conversely compaction is important for constructed structures and trails). It is far better to minimize compaction in the landscape areas rather than attempt (with poor success) to undo compaction after the fact.

(B-2) As an example, exposed soil in the Parnell Esker is quite gravelly (see image right). As discussed earlier, due to fill and space limitations, it is not yet known whether we can create any gravel deposits / stratigraphy in the eskers and kames. Even if not possible to a great extent, creating some of this stratigraphy in limited areas would support both the vegetation diversity plans and the educational opportunities.



B. Soil Structure, Texture, Content

The relationship between (potential) soil and potential vegetation is mutual. In a natural landscape, the influence of vegetation on soil is more significant than the influence of soil on vegetation (see “soil” and “veg” in the diagram at top right representing a discussion of the factors influencing vegetation).

However, here, with depauperate soil, the restoration question is whether we can provide soil with enough of the vegetation-supporting characteristics to establish the vegetation and initiate the mutual processes.

(B-1) Soil preparation will be complicated by the different needs of different habitats. Nutrient-poor soil is advantageous in prairie establishment (so as to not favor weed species). Nutrient-rich soil is advantageous in forest and woody species establishment, as long as weeds can be managed effectively. Soil nutrient availability is affected

(B-3) “The Top 18 Inches”. Consider concepts of how to make “perforated soil structure”, or soil structure that counters compaction (not just topsoil, but into subsoil) with air spaces. The annual portions of roots of a prairie that grow and decompose each year and influence soil structure and porosity are an example of the influence of vegetation on soil that we desire to jump-start. Option to consider: “gentle” lifts in the placement and movement of soil; in-process techniques such as layering decomposable material for structure with soil placement; post-process techniques like ripping/subsoiling (to perhaps 18” depth), but also drilling into soil to make and hold perforations with a material like inactive bamboo stakes.

(B-4) Early information from the Remediation Action Plan on soil profile constraints is needed - e.g., whether the upper inches of the clay can be placed without compaction.

(B-5) Suggest adherence by all teams to specification and construction best practices, e.g. NCHRP 25-25(04), Environmental Stewardship Practices, Procedures, and Policies for Highway Construction and Maintenance (or an agreed equivalent substitute). This particular document discusses the following items, for example: “Specify the right equipment for the job; Mark large trees, where present, with colored and labeled flagging to ensure that the field crew understands what is to be cut and what is to remain and be protected from damage; Temporary barriers to protect existing trees, plants, and root zone should be provided, if necessary; Ropes, cables, or fencing should not be fastened to trees; Clear vegetation from unstable or erodible banks by hand instead of using heavy machinery; Minimize soil compaction by using equipment types such as wide track or rubber tired with a greater reach or that exerts less pressure per square inch on the ground, resulting in less overall area disturbed or less compaction of disturbed areas; Decompact disturbed soils where needed prior to revegetation; Heavy equipment may use various routes to reduce severe compaction in any one area; Conversely, using fewer haul routes may result in less overall compaction; After use, haul routes may be ripped or subsoiled to reduce compaction and promote infiltration; If riparian vegetation is to be removed with chainsaws, consider using saws currently available that operate with vegetable-based bar oil.”



An idealized example of minimal-disturbance-footprint construction; small foundation within healthy old prairie.

(B-6) HAST itself: Perhaps it is possible to consider delaying paving of the HAST. This was suggested by Catrine at The Bike Federation related to cost control and sequencing, but for purposes here, it is related to degree of compaction of subsoil. If we minimize compaction overall, then perhaps it is acceptable to let the trail “settle” for a couple of years as gravel with the vegetation restoration proceeding in the landscape areas, and then re-compact just the trail and pave later.

C. Drainage

(C-1) Drainage generally. In a natural healthy mostly upland landscape in Southeastern Wisconsin, when it rains, some of the water is trapped by vegetation/leaves, and evapotranspires. Some lands on the ground. Of the water that lands on the ground, some infiltrates, some may temporarily pool (saturated ground) and may evaporate, some may move across the surface (saturated ground -- and our high clay content soils) to lower areas, and temporarily pool or evaporate, or find its way to a stream. The amount in the latter category of surface runoff is a minority. Ultimately, our goal is that our landscape reflects this historic natural behavior. Roots and soil structure are the factors that allow some degree of infiltration and maximal saturated ground, and above ground vegetation for trapping water and evapotranspiration. Early vegetation establishment independently will be important to minimizing runoff and erosion, and the use of quickly-germinating cover crop will be key.

Local topographic variation is also important. Often, best stormwater practices emphasize sheet flow -- as opposed to the alternative of sending water quickly to concentrated routes (pipes, ditches) -- but this oversimplification is meant to prevent a worse problem rather than relating the complexities of a better situation. Sheetflow is better than pipes and ditches. But smooth slopes everywhere discount the function that nature can provide. Topographic variability that is within the ranges where native vegetation is sustainable and functional is better than smooth slopes everywhere. Pockets of water collection are, in our ecosystems, good. It is complex, though -- since it requires evaluation of the natural systems to operate at the margins of functional operating conditions (e.g. steeper slopes, more flow) -- and also doesn't lend itself to large equipment answers.

(C-2) Perhaps it is possible to eliminate the use of riprap or piping to manage trail drainage in Airline Yards. Perhaps the 2' shoulders required for the HAST can (and should) be vegetated; if so, what are the criteria for vegetation, for example height?

D. Microtopography

(D-1) Topographic variability generally supporting heterogeneous surfaces and also consistent with the story of old glacial landscapes – can this be fully captured at a grading checkpoint, that considers technique and practicality?

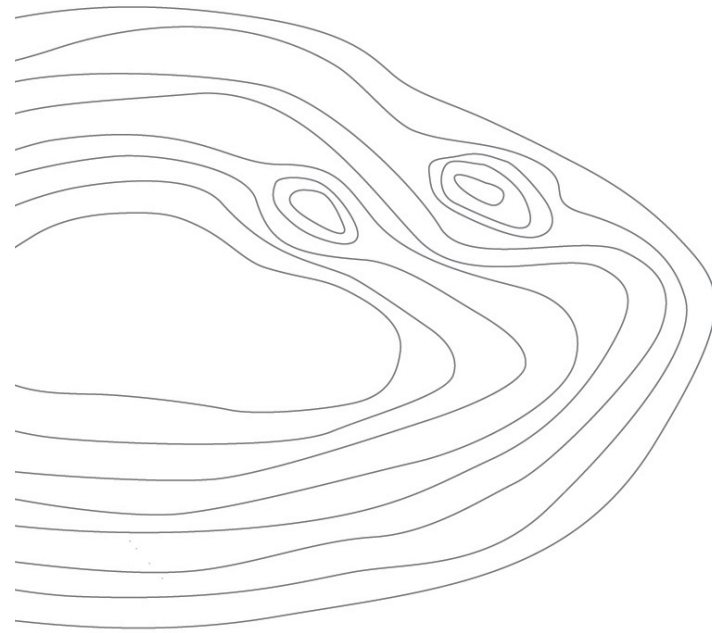
(D-2) Restoration techniques in water-limiting environments include creating moisture-catching depressions as planting sites. Water limitation is normally not our biggest problem, but given our rain patterns of recent years, may be useful for certain species in certain areas (for example, with herbaceous species in areas meant for eventual forest establishment).



Images from Whisenant 1999.

Depressions used in seedbed preparation (left), and for woody plants on severely crusted soil (right).

(D-3) In forested systems especially on hilly landscapes, it would be natural for previous tree falls, forming “cradle-knoll” topography, to serve as nurse sites for the growth of new trees. There is research showing 60% of trees on presently forested drumlins (Nicolet National Forest) are on knolls, and only 2% in cradles; also that the cradle-knoll topography is more pronounced on backslopes (“probably because of slope-mediated difference in cradle-knoll formation”) (Kabrick 1997). This may provide a restoration technique, to create knolls of nutrient-rich “nurse” soil into which trees are planted. In our more southern climate with warmer temperatures and less rainfall than Nicolet, the nutrient idea of the knoll needs to be balanced with microtopography creating moisture pockets upslope.

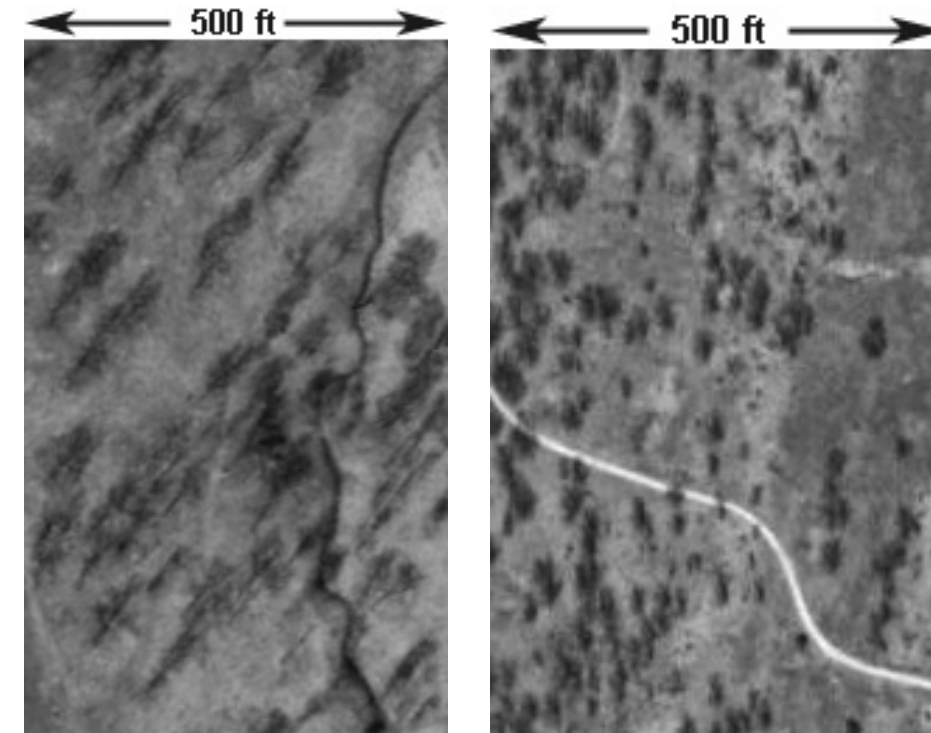


E. Vegetation Patterns

(E-1) Patterns of herbaceous species (see images at lower left). One of the goals of the restoration will be to capture natural patterns in the vegetation early, through restoration techniques. These are natural patterns that would develop over centuries. They are part of what creates coherence (in the presence of complexity) in natural landscapes. We are seeding and planting lots of species in a barren area all at once... with care, we can initiate some of those patterns and help with perception of early stages of the landscape.

Species spatial patterning can be caused by a species’ own life history: seed dispersal mechanisms (wind, birds, gravity, etc.), seed travel distance, non-sexual reproduction e.g. rhizomatic cloning. Patterns can be affected by microclimate variations, by interspecific interactions, etc. Those patterns that are evident are often either (a) aggregated or “drifts”, or (b) irregular/random individuals. One goal in techniques will be segregated and non-random seeding and/or planting that allows the jump-starting of these patterns, as appropriate to species and to habitat type.

(E-2) Savanna tree patterns: consider the following reference oak savannas with mixes of tree ages including mature individuals. These are aerial photographs of savannas at Funk’s Grove, IL and Illinois Beach State Park. For comparison, Airline Yards is at most 400’ wide.



Above: visible examples of natural species patterning.

(E-3) Heterogeneity and Landscape Mosaic. Within community types, patterns correlated to local microclimate and local conditions should also be part of the restoration jump-start. Some of this variability is initially indicated in the vegetation community plan herein, e.g. the protected ravines and swales within the larger glacial features. For example, in a south-facing prairie community, the swales might contain a swath of sumac, or dominance of a more mesic herbaceous species. The restoration plans will incorporate heterogeneity within community type as a sub-zone, by phasing, or by technique (e.g., plugs or plants could be used within a sub-zone rather than seed).

(E-4) Maximize pattern types. E.g., plan different appropriate habitats for the different kettles, one open sedge meadow and one forested ephemeral wetland.

F. Restoration Techniques

(F-1) For weed management in a fledgling forest community, one technique is direct seeding or seedling planting of tree species. In this case, rows of seedlings that can accommodate 6"-8"-high mowing between the rows for weed management may be important. Given our slopes, this also likely translates into contour furrowing on mound slopes.

It would be possible to consider the forest community types as having similar preparation for management -- that is, trees planted in contour rows, with ability to manage weeds between rows. The species and spacings vary by forest types, but the setup for management is similar. For example, see the simplified plant community illustration (below) that only distinguishes forest types (green) from grassland and savanna types (yellow).



(F-2) Cover Crops will be used, immediately following soil preparation, for erosion control and weed control - and to allow time for mediation of native vegetation changes. In earlier phases of the park (see photographs above right), a mix of annual oats, annual rye, flax and buckwheat was used successfully; this is an inexpensive mix of annuals that germinate quickly, reseed for a time but do not persist over multiple years as the native perennials become established. This mix also has the advantage of an aesthetic appearance of young prairie, with a small variety in texture and bloom.

In Airline Yards, different cover crops can be used in different habitat zones, to similarly provide an early aesthetic of the eventual biodiversity. Legumes (to fix nitrogen, e.g. the native Partridge Pea, *Chamaecrista fasciculata*) and biennials (e.g. the natives *Gaura* and *Oenothera Biennis*) will be considered. It is also possible that agricultural crops may be used in areas as a first-year cover to aid in soil preparation. Crops such as soybeans are sometimes used (soybeans are also legumes), in part because of the well-understood agricultural management and ability to do large-scale, the broader cover and biomass (followed by disking which turns this biomass into the soil), and sometimes because of the genetic engineering of "roundup-ready" seed type, which allows for the use of glyphosate for weed control while the crop is growing. "Roundup-ready" crops are not suggested or recommended, due to concerns

about cross-fertilization, and because broadcast spray of glyphosate is not recommended. (Early in this process, the UEC and WDNR should collaborate on an herbicide policy).



(F-3) Plans and specifications for all project teams should require that any cut vegetation remains onsite, either for use in LRP construction, or for composting. Woody debris can be very helpful in restoration, initially creating beneficial microclimate, and later providing nutrients.

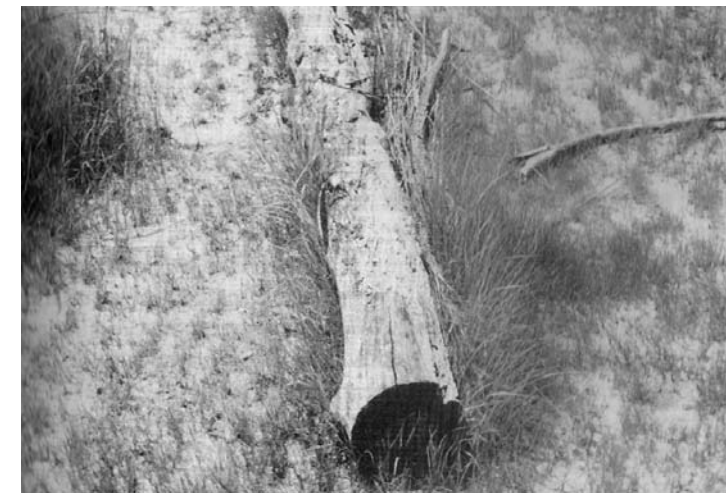


Image from Whisenant 1999.

(F-4) The concept of "facilitation", for example the role of early-successional or ruderal species in any plant community to develop soil, biomass, and nutrient cycling that facilitates the establishment of later-successional species, is commonly used in restoration. This will influence the restoration trajectories and the species used to initiate the trajectories. In a complementary way, we will tend to wait to introduce conservative species until conditions will support them.

(F-5) The concept of "seed bombs" is discussed in urban guerilla gardening (Tracey 2007): small self-contained packets filled with seeds, soil, nutrients and water; to land on bare ground, break down, and have enough buffering content to allow germination and establishment. A possibly translatable idea.

(F-6) The process of restoring toward forest is a particular challenge because of the intermediate need for soil organic content and shade. Techniques will be considered that can create pockets of shade via more mature trees or via temporary shade structures, as one way to help accelerate this process.

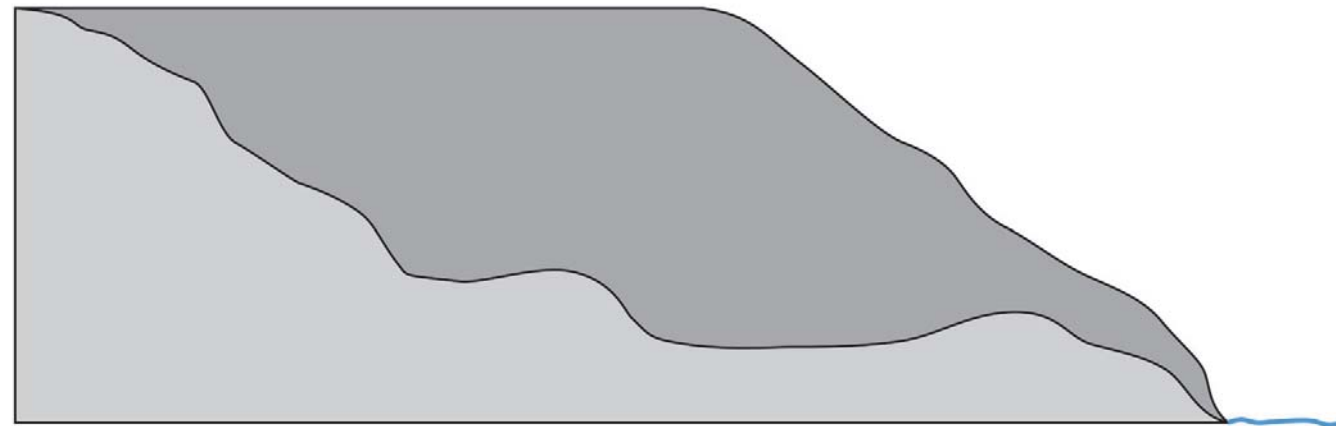
(F-7) Genotype policy needs to be created in collaboration with WDNR and UEC. Appropriate local genotype is the goal, but should be defined more specifically. Clewell 2007 suggests that in restoring ecosystems on physically altered and reclaimed land, where soil structure, hydrology, and other conditions were altered, it may be best to introduce multiple (regional) ecotypes, allowing for selection pressures in the new environment to determine which ecotypes survive (i.e. supporting this with genetic variety). Another goal is to not use selections or cultivars that may have had breeding to suppress important ecological functions such as mast production and deformities that create fauna habitat.

(F-8) Microclimate buffers. As transitional zones, “edges” of habitat types can be used to help jump-start microclimate - so that in early years the edges might stand out unnaturally. An example could be dense planting of shrubs and early successional trees on the southern edge of a forest type to improve soil moisture protection, or as screens from desiccating winds.

(F-9) A recognition that while “the subtleties of gradients, frontier zones, and microsities are particularly difficult to recreate with precision and must be allowed to redevelop on their own” (Clewell 2007), we must use our best efforts to encourage landscape heterogeneity in microtopography, and hedge our bets to a degree with species choices.

G. Riverbank Alterations

In the river cut of the Concept Plan, the team was considering whether occasionally-flooded backwater terraces could be supported. (Soil borings and groundwater levels and quality will certainly constrain possibilities, as well as the flashy river conditions). For example, could the existing riverbank (an approximation, shaded darker in the diagram below) be altered to provide terrace areas (grade shaded lighter) that are flooded in different circumstances, and could potentially have hydrology and soil characteristics that retain moisture between flood events? These provide opportunity for mostly-shaded floodplain terrace plant community types.



(G-1) Consider timing of construction relative to river disturbance and breeding habitat disturbance.

(G-2) Need agreement on “stabilizing” riverbank. What we are trying to do is balance the lack of natural floodplain and tight urban conditions with the measures necessary to keep chunks of riverbank from eroding and moving downstream. Our goal is not to make a “stable” riverbank in the sense of unchanging.

(G-3) The river edge conditions of such a cut are challenging to stabilize and be flexible to allow substantial vegetation in the presence of flashiness. Could we consider vegetated toe of slope structures that can float to some degree and are anchored? (reference Brooklyn Heights Park project).

H. Cultural Components and Support of Wildness

(H-1) Allow for sledding hill - appropriate access, grades, aspect, and lack of planned trees :).

(H-2) The eventual community gardens site (on the richer soil on the leading portion of the “glacial outwash plain”) can also potentially provide a nursery for early restoration work, in part or in full. Desire early feedback from UEC on balance and phasing of community gardens and adjacent edible landscapes (e.g. native fruit/nut orchards, “granola fields” utilizing native perennial grain, legumes, and composites). The physical characteristics of this part of the site could also consider terracing, sod walls, etc.

(H-3) Consider “invisible” (unconstructed) secondary trails and/or deferment of secondary trails until UEC use patterns, in parallel with restoration, develop. (Consider Riveredge Nature Center, which practices leave no trace access - no trails - in areas of less traffic). On the other hand, preliminary feedback from UEC Stewardship staff is that establishing footpaths early will be important, to avoid too many desire trails (including from bikes).



An ideal of an invisible trail, left (the easily followable trail runs along the top of the ridge here).

(H-4) The end moraine, as discussed earlier, typically shows exposed boulder fields and gravel. This could also be an opportunity for human-traversal through the landscape, as in this designed landscape example (below) from the University of Wisconsin-Arboretum.



I. Think-Ahead Items

(I-1) Plant sources and contract growing: DNR nursery, UEC nursery, City of Milwaukee nursery, Airline Yards nursery.

(I-2) Are there mechanisms for incremental work? E.g., team may recommend compost operation to support soil structure – but would need to happen early. Is it possible to divert funds for preparatory work that needs substantial lead time?

(I-3) Support for hybrid contracting in LRP implementation - affects phasing and details of LRP. There seems to be an obvious need for contractors to incorporate UEC and volunteers. In addition, we might consider separation of “small” LRP implementation aspects to give work to small local firms (e.g. community gardens infrastructure; hand-cut vegetation removal; etc.).

(I-4) Save boulders for glacial erratics that are currently behind Palermos and as uncovered in VP and VP II.

(I-5) Save woody debris from VP and VP II construction.

(I-6) If the Partners begin management of Riverbank Management Areas prior to VP II construction, keep-out areas need to be determined and properly marked.

(I-7) Anticipated incorporation of UEC programming related to participatory restoration should be known prior to development of LRP details. This presumably needs to be worked out by the project Partners.

PRELIMINARY RESTORATION PHASING OPTIONS

Restoration phasing is related to the projected timing of start of implementation.

Phasing plans are also strongly connected to the participatory restoration plans of the UEC with WDNR. The actions of restoration are inherently valuable, and getting things done as fast as possible does not necessarily provide the strongest participatory restoration value. Ecologically, fast is also tricky. We must balance some of the advantages of working at a slower manageable pace (and size of areas) with some of the advantages of faster-paced critical mass transformation (e.g. “instant” biomass).

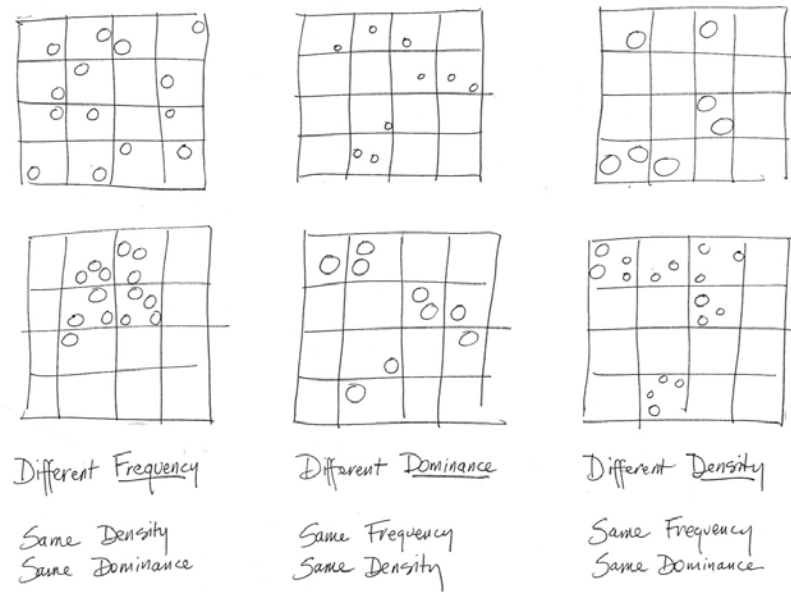
We must also consider the need to implement the funded work in a timely and effective manner, and the anticipated limited resources of the WDNR and UEC to keep up with landscape management (stewardship), much less oversee fundamental restoration activity.

Phasing options are in process and this section is not yet complete.

ECOSYSTEMS TO BE RESTORED / REFERENCE MODELS

In the following pages, target ecosystems that would have historically been present in the general vicinity of the project site are described. For each, the WDNR classification² is used, with key species. Reference ecosystems are provided. These are nearby places that include the given community type. Floras are provided where available. Other factors and conditions that can provide insight to this restoration project are noted.

In addition to the WDNR's descriptions, Curtis' (Curtis 1959) importance values (IV) for trees in relevant communities are provided. IV is a sum of frequency (how often a species occurs in samples, a measure of distribution), dominance (species' trunk basal area in samples, a measure of age and/or abundance), and density (numbers of individuals per area). Within a plant community, these can contribute to long-term goals.



The Attachments provide the [historic] Native Flora of Milwaukee County³, as compiled by Larry Leitner, SEWRPC principle biologist, as well as the species composition planted north of the river to date, and inventories of some of the reference sites.

² <http://www.dnr.state.wi.us/ORG/land/er/communities/>

³ Native Flora of Milwaukee County

Floodplain Forest:

A lowland hardwood forest community that occurs along large rivers, usually stream order 3 or higher, that flood periodically. Canopy dominants may include silver maple (*Acer saccharinum*)... green ash (*Fraxinus pennsylvanica*), hackberry (*Celtis occidentalis*), swamp white oak (*Quercus bicolor*), and cottonwood (*Populus deltoides*). Buttonbush (*Cephalanthus occidentalis*) is a locally dominant shrub and may form dense thickets on the margins of oxbow lakes, sloughs and ponds within the forest. Nettles (*Laportea canadensis* and *Urtica dioica*), sedges, ostrich fern (*Matteuccia struthiopteris*) and gray-headed coneflower (*Rudbeckia laciniata*) are important understory herbs, and lianas such as Virginia creepers (*Parthenocissus* spp.), grapes (*Vitis* spp.), Canada moonseed (*Menispermum canadense*)... are often common. Among the striking and characteristic herbs of this community are cardinal flower (*Lobelia cardinalis*) and green dragon (*Arisaema dracontium*). (WDNR)

(excluding taxa not native to Milwaukee County)

Curtis "Wet forest":

- Silver Maple (*A. saccharinum*) IV 82
- Black Willow (*S. nigra*) IV 64
- Cottonwood (*P. deltoides*) IV 55
- American Elm (*U. americana*) IV 27
- Swamp White Oak (*Q. bicolor*) IV 15
- Green Ash (*F. pennsylvanica*) IV 8
- Bur Oak (*Q. macrocarpa*) IV 6
- Ash-leaved Maple (*A. negundo*) IV 3
- Basswood (*Tilia americana*) IV 2

...

(excluding taxa not native to Milwaukee County)

Curtis "Wet-mesic forest":

- American Elm (*U. americana*) IV 74
- Silver Maple (*A. saccharinum*) IV 58
- Green Ash (*F. pennsylvanica*) IV 27
- Basswood (*Tilia americana*) IV 24
- Swamp White Oak (*Q. bicolor*) IV 15
- Red Oak (*Q. rubra*) IV 10
- Red Maple (*A. rubrum*) IV 10
- White Ash (*F. americana*) IV 8
- Sugar Maple (*A. saccharum*) IV 8
- Red Elm (*U. rubra*) IV 6
- Shagbark Hickory (*C. ovata*) IV 5
- White Oak (*Q. alba*) IV 4
- Hackberry (*C. occidentalis*) IV 4 ...

Reference Site: Hawthorn Glen, Milwaukee, in part³.

"Take a trip 10,000 years in the past when retreating glaciers formed this landscape. Hawthorn Glen is a 23-acre nature center... Natural features include steep bluffs, flood-plain hardwood forest, spring-fed wetland, and a restored prairie."

Hawthorn Glen also has relevant mesic forests on steep bluff slopes including north-facing. The floodplain forest includes both herbaceous and woody species that we would hope to diversify the riverbanks and may serve as a model for perched terraces.

Hawthorn Glen



Wisconsin River



Notes, Relevance to Site, and Possible Restoration Trajectories

The existing riverbank harbors a riparian forest community. As discussed in biotic condition factors, goals here are recovery of the damaged and degraded riverbank habitat, through management to control invasive exotic species and increase cover of native species and diversity of native species, both woody and herbaceous. In areas where the riverbank will be physically modified, slope protection measures should ideally provide a degree of vegetation protection from flashy scour. In lower portions of the riverbank, supplemental planting can be focused in areas where slope variability and established vegetation allows some local protection from flashiness.

Occasionally Flooded Backwater Terrace:

Related to floodplain forest, but occasionally flooded as a river backwater terrace - artificially engineered as part of the planned river cut for river access. Conditions and feasible details not yet known.

Larry Leitner (SEWRPC principle biologist): “The problem, of course, is that the riverine systems have been so degraded over time that it is difficult to find any that exhibit what we think 'ought' to be there”.

Reference Site:

TBD. A couple of possibilities suggested by Larry: “some backwater areas along the Milwaukee River in Ozaukee and Washington counties that are occasionally flooded and have pretty much natural vegetation. Specifically, areas in T9N R22E sections 18 and 19 in Ozaukee, and the Milwaukee River Floodplain Forest State Natural Area near Kewaskum (12N 19E Section 14). Also, maybe some of the parts of the lower Fox River in the New Munster/Silver lake area of Kenosha County”.

Casual species notes, 30 Oct 09 nma, Milwaukee River Floodplain Forest SNA: *Acer saccharinum*, *Prunus serotina*, *Prunus virginiana*, *Tilia americana*, *Quercus rubra*, *Osmunda cinnamomea*, *Dryopteris* spp, *Calamagrostis canadensis*, *Solidago* spp, *Aster* spp., *Juniperus communis*

Milwaukee River Floodplain Forest SNA



Milwaukee River Floorplain Forest SNA



Notes, Relevance to Site, and Possible Restoration Trajectories

The concept plans for the river cut will need to be matched with understood groundwater hydrology and further details to develop the plant community opportunities. The site may afford conditions for some portions of floodplain forest, shrub carr, calcareous fen, clay seepage bluff, or ephemeral pond.

The use of riparian shrubs to establish structure may be important in more quickly developing stability in this area.

Southern Mesic Forest:

This upland forest community occurs on rich, well-drained soils. The dominant tree species is sugar maple (*Acer saccharum*), but basswood (*Tilia americana*) and (near Lake Michigan) beech (*Fagus grandifolia*) may be co-dominant. Many other trees are found in these forests, including those of the walnut family (*Juglandaceae*). The understory is typically open (sometimes brushy with species of gooseberry (*Ribes*) if there is a past history of grazing) and supports fine spring ephemeral displays. Characteristic herbs are spring-beauty (*Claytonia virginica*), trout-lilies (*Erythronium* spp.), trilliums (*Trillium* spp.), violets (*Viola* spp.), bloodroot (*Sanguinaria canadensis*), blue cohosh (*Caulophyllum thalictroides*), mayapple (*Podophyllum peltatum*), and Virginia waterleaf (*Hydrophyllum virginianum*). (WDNR)

Curtis "Southern Mesic Forest" (excluding taxa not native to Milwaukee County)	(continued)	
Sugar Maple (<i>A. saccharum</i>) IV 126	Bitternut Hickory (<i>C. cordiformis</i>)	IV 5
Basswood (<i>Tilia americana</i>) IV 34	Butternut (<i>J. cinerea</i>)	IV 5
American Beech (<i>Fagus grandifolia</i>) IV 30	American Elm (<i>U. americana</i>)	IV 5
Red Elm (<i>U. rubra</i>) IV 26	Black Cherry (<i>P. serotina</i>)	IV 2
Red Oak (<i>Q. rubra</i>) IV 21	Kentucky Coffee (<i>Gymnocladus dioica</i>)	IV 2
Ironwood (<i>O. virginiana</i>) IV 15	Shagbark Hickory (<i>C. ovata</i>)	IV 2
White Ash (<i>F. americana</i>) IV 7	Hackberry (<i>C. occidentalis</i>)	IV 2
White Oak (<i>Q. alba</i>) IV 6	...	

Reference Site: Seminary Woods
 Reference Site: Homestead Woods
 Reference Site: Mequon Woods (in part)

Seminary Woods



Seminary Woods



Mequon Woods



Notes, Relevance to Site, and Possible Restoration Trajectories

Forest communities have the longest time period (hundreds of years) to fully establish. The trajectory from bare ground is challenged by the lack of forest soil (with significant O- and nutrient-rich A- soil horizons and healthy microorganisms) and the lack of shade.

Restoration trajectories can include:

- (1) Direct seeding of tree species, of a composition mix anticipated in the eventual forest. Typically large-and hard-seeded species, e.g. acorns, hickories, have the most success, because of less rodent predation and more ability to mediate environmental nutrients and moisture. The corresponding herbaceous cover is often treated as a transitional cover crop (although may be or include perennial natives) that are sun-tolerant. In order to protect tree seedlings and manage weeds, direct seeding is usually done in rows that can be marked and mown between. Direct seeding can be done mechanically in large areas or by hand.
- (2) Planting of whips (young tree seedlings, typically 2-3 years old), of a composition mix anticipated in the eventual forest. This attempts to make faster progress, and can include species which would tend not to be as successful via direct seeding. Similar cover crop considerations apply. Planting may be mechanical or potentially by hand. A concern, particularly with mechanical planting, is that the roots are essentially dragged into the groove cut by the planter, and take a vertical and compacted form in the soil, not the natural branching of roots which would have developed from seed; this can suppress survival and growth.
- (3) Initial planting of dominantly early-successional tree species densely, with a goal of faster cover and shade. Species such as aspen, choke cherry, etc. can be considered, although the vegetative reproduction of these species can make eventual management difficult. This technique attempts to accelerate natural successional processes, but since many pieces in the ecosystem puzzle are still missing, requires watchful adaptive management to bring in the missing pieces, e.g. the later-successional species. This process might wait for shade to begin to introduce native understory and herbaceous species.
- (4) Any techniques in combination with artificial shade structures, that can allow patches of establishment of open woods herbaceous species that are tolerant of poor soil conditions.
- (5) Any techniques in combination with planting of large native trees of the appropriate species. Earlier discussion of cradle-knoll topography mimics to support the tree's microclimate apply.

Northern Mesic Forest (relict):

This forest complex covered the largest acreage of any Wisconsin vegetation type prior to European settlement. Sugar maple (*Acer saccharum*) is dominant or co-dominant in most stands, while hemlock (*Tsuga canadensis*) was the second most important species, sometimes occurring in nearly pure stands with white pine (*Pinus strobus*). Beech (*Fagus grandifolia*) can be a co-dominant with sugar maple in the counties near Lake Michigan. Other important tree species were yellow birch (*Betula allegheniensis*), basswood (*Tilia americana*), and white ash (*Fraxinus americana*). The groundlayer varies from sparse and species poor (especially in hemlock stands) with woodferns (especially *Dryopteris intermedia*), bluebead lily (*Clintonia borealis*), clubmosses (*Lycopodium* spp.), and Canada mayflower (*Maianthemum canadense*) prevalent, to lush and species-rich with fine spring ephemeral displays. After old-growth stands were cut, trees such as quaking and bigtoothed aspens (*Populus tremuloides* and *P. grandidentata*), white birch (*Betula papyrifera*), and red maple (*Acer rubrum*) became and still are important in many second-growth Northern Mesic Forests. Several distinct associations within this complex warrant recognition as communities, and draft abstracts of these are currently undergoing review. (WDNR)

Curtis "Northern Mesic Forest" (excluding taxa not native to Milwaukee County)	(continued)
Sugar Maple (<i>A. saccharum</i>) IV 106	American Elm (<i>U. americana</i>) IV 7
Hemlock (<i>Tsuga canadensis</i>) IV 79	Red Maple (<i>A. rubrum</i>) IV 5
American Beech (<i>Fagus grandifolia</i>) IV 30	Paper Birch (<i>B. papyrifera</i>) IV 5
Yellow Birch (<i>B. alleghaniensis</i>) IV 29	White Ash (<i>F. americana</i>) IV 4
Basswood (<i>Tilia americana</i>) IV 16	Red Elm (<i>U. rubra</i>) IV 3
Ironwood (<i>O. virginiana</i>) IV 7	White Cedar (<i>Thuja occidentalis</i>) IV 2
Red Oak (<i>Q. rubra</i>) IV 7	White Pine (<i>Pinus strobus</i>) IV 2
	...

Reference Site:

to be determined.

Hemlock Draw (for slopes)



Notes, Relevance to Site, and Possible Restoration Trajectories

(See Southern Mesic Forest)

Shrub-Carr:

This wetland community is dominated by tall shrubs such as red-osier dogwood (*Cornus stolonifera*), meadowsweet (*Spiraea alba*), and various willows (*Salix discolor*, *S. bebbiana*, and *S. gracilis*). Canada bluejoint grass (*Calamagrostis canadensis*) is often very common. Associates are similar to those found in Alder Thickets and tussock-type Sedge Meadows. This type is common and widespread in southern Wisconsin but also occurs in the north.

Alder Thicket:

These wetlands are dominated by thick growths of tall shrubs, especially speckled alder (*Alnus incana*). Among the common herbaceous species are Canada bluejoint grass (*Calamagrostis canadensis*), orange jewelweed (*Impatiens capensis*), several asters (*Aster lanceolatus*, *A. puniceus*, and *A. umbellatus*), boneset (*Eupatorium perfoliatum*), rough bedstraw (*Galium asprellum*), marsh fern (*Thelypteris palustris*), arrow-leaved tearthumb (*Polygonum sagittatum*), and sensitive fern (*Onoclea sensibilis*). This type is common and widespread in northern and central Wisconsin, but also occurs in the southern part of the state. (WDNR)

Shrub Carr woody species Curtis' Presence %:

Redosier Dogwood (<i>C. stolonifera</i>)	P 70
Pussy Willow (<i>Salix discolor</i>)	P 60
Meadowsweet (<i>Spiraea alba</i>)	P 50
Bebb's Willow (<i>Salix bebbiana</i>)	P 30
Slender Willow (<i>Salix petiolaris</i>)	P 10

Alder Thicket woody species Curtis' Presence %:

Speckled Alder (<i>Alnus incana</i>)	P 100
Meadowsweet (<i>Spiraea alba</i>)	P 67
Redosier Dogwood (<i>C. stolonifera</i>)	P 50
Black Currant (<i>Ribes americanum</i>)	P 50
Highbush Cranberry (<i>V. trilobum</i>)	P 17

Reference Site:

To be determined.

Chiwaukee



(photo: Virginia Kline WDNR)



Notes, Relevance to Site, and Possible Restoration Trajectories

(to be completed)

Mesic Prairie:

This grassland community occurs on rich, moist, well-drained sites. The dominant plant is the tall grass, big bluestem (*Andropogon gerardii*). The grasses little bluestem (*Andropogon scoparius*), indian grass (*Sorghastrum nutans*), porcupine grass (*Stipa spartea*), prairie dropseed (*Sporobolus heterolepis*), and tall switchgrass (*Panicum virgatum*) are also frequent. The forb layer is diverse in the number, size, and physiognomy of the species. Common taxa include the prairie docks (*Silphium* spp.), lead plant (*Amorpha canescens*), heath and smooth asters (*Aster ericoides* and *A. laevis*), sand coreopsis (*Coreopsis palmata*), prairie sunflower (*Helianthus laetiflorus*), rattlesnake-master (*Eryngium yuccifolium*), flowering spurge (*Euphorbia corollata*), beebalm (*Monarda fistulosa*), prairie coneflower (*Ratibida pinnata*), and spiderwort (*Tradescantia ohioensis*). (WDNR)

Curtis "Mesic Prairie" Prevalent Species (excluding taxa not native to Milwaukee County)			* species are modal, their Presence values are higher here than in any other Wisconsin community		
	Presence	Avg Freq			
Achillea millefolium*	62%	3%	Helianthus occidentalis*	44%	19%
Ambrosia artemisiifolia	51	23	Lactuca canadensis*	47	7
Amorpha canescens	73	32	Lathyrus venosus	51	2
Andropogon gerardii*	98	29	Lespedeza capitata	58	18
Anemone cylindrica	51	5	Liatris aspera*	87	18
Antennaria neglecta	56	7	Lithospermum canescens	53	5
Apocynum androsaemifolium	42	6	Monarda fistulosa	73	22
Asclepias syriaca	76	13	Panicum leibergii*	62	46
Aster azureus	56	16	Phlox pilosa	53	21
Aster ericoides	76	44	Physalis virginiana	42	8
Aster laevis*	89	35	Potentilla arguta	58	13
Baptisia leucophaea*	44	3	Quercus macrocarpa	40	2
Calystegia sepium*	49	13	Ratibida pinnata	85	32
Ceanothus americanus*	66	9	Rhus glabra	42	5
Comandra umbellata	53	32	Rosa sp.*	91	36
Coreopsis palmata	76	34	Rudbeckia hirta	44	3
Dalea purpurea	60	7	Schizachyrium scoparium	69	28
Desmodium canadense	49	3	Silphium integrifolium	40	3
Desmodium illinoiense*	64	20	Silphium laciniatum*	78	8
Dodecatheon meadia	53	3	Solidago missouriensis*	58	15
Elymus canadensis	42	5	Solidago rigida*	76	15
Eryngium yuccifolium*	53	21	Solidago speciosa*	62	11
Euphorbia corollata	86	75	Sorghastrum nutans	58	13
Fragaria virginiana	56	16	Sporobolus heterolepis	64	35
Galium boreale	40	8	Stipa spartea	69	58
Helianthus grosseserratus	44	2	Tradescantia ohioensis	64	31
Helianthus laetiflorus*	87	40	Viola pedatifida	42	13

Reference Sites: Chiwaukee Prairie, Carity Prairie, others.

Chiwaukee



Nine Mile Prairie (for density/diversity)



Sylvan Runkel (for slopes)



Notes, Relevance to Site, and Possible Restoration Trajectories

Prairie restoration is relatively well-understood, and has a much shorter time frame (decades or years) to full establishment.

Site preparation to minimize weeds is important. This applies to all restoration types. Our stockpiled topsoil is expected to be relatively depauperate of weeds and of nutrients (in particular, little sign of extensive trouble like Reed Canary Grass - and we can re-evaluate the weed situation this summer), and we have also had success on the north side of the river with direct seeding of natives without additional weed preparation.

Typical projects are mechanically seed-drilled with a diverse (> 40 spp) species mix, in fall or in late spring (fall tends to disfavor grasses, per Marc White). The mix of species can include the full complement desired including both generalist and conservative species; often cost is a major factor in postponing the inclusion of conservative species. Many conservative prairie species can take years to germinate. Relative compositions of legumes, other forbs, and grasses are well-documented. Cover crop initially, and supplementally seeded where and when needed after that, is essential to control of weeds.

An aspect typically ignored in mechanically-seeded projects is the jump-starting of patterns in the species as previously discussed. This can be managed by segregated seeding, including hand-broadcast of some species.

Dry-Mesic Prairie:

This grassland community occurs on slightly less droughty sites than Dry Prairie and has many of the same grasses, but taller species such as big bluestem (*Andropogon gerardii*) and Indian-grass (*Sorghastrum nutans*) dominate. Needle grass (*Stipa spartea*) may also be present. The herb component is more diverse than in Dry Prairies, including many species that occur in both Dry and Mesic Prairies.

Dry Prairie:

This grassland community occurs on dry, often loess-derived soils, usually on steep south or west facing slopes or at the summits of river bluffs with sandstone or dolomite near the surface. Short to medium-sized prairie grasses: little bluestem (*Schizachyrium scoparium*), side-oats grama (*Bouteloua curtipendula*), hairy grama (*B. hirsuta*), and prairie dropseed (*Sporobolus heterolepis*), are the dominants in this community. Common shrubs and forbs include lead plant (*Amorpha canescens*), silky aster (*Aster sericeus*), flowering spurge (*Euphorbia corollata*), purple prairie-clover (*Petalostemum purpureum*), cylindrical blazing-star (*Liatris cylindracea*), and gray goldenrod (*Solidago nemoralis*). (WDNR)

Curtis “Dry-Mesic Prairie” Prevalent Species
(excluding taxa not native to Milwaukee County)

	Presence	Avg Freq	* species are modal, their Presence values are higher here than in any other Wisconsin community	
Ambrosia artemisiifolia	71%	10%	Kuhnia eupatorioides	61
Amorpha canescens	90	41	Lespedeza capitata	47
Andropogon gerardii	97	61	Liatris aspera	80
Anemone cylindrica	76	6	Liatris cylindracea	47
Anemone patens	50	9	Lithospermum canescens	68
Antennaria neglecta	70	14	Monarda fistulosa	65
Artemisia caudata	65	13	Oenothera biennis	64
Asclepias syriaca	50	1	Panicum leibergii	59
Asclepias verticillata	59	16	Panicum oligosanthos*	64
Aster azureus*	68	14	Physalis virginiana	45
Aster ericoides*	80	21	Potentilla arguta	80
Aster laevis	44	6	Ratibida pinnata	70
Aster ptarmicoides	39	16	Rhus glabra*	61
Aster sericeus	76	51	Rosa sp.*	88
Bouteloua curtipendula	77	69	Rudbeckia hirta	41
Comandra umbellata	58	11	Schizachyrium scoparium	69
Coreopsis palmata	76	31	Sisyrinchium campestre*	49
Dalea candida	42	4	Solidago nemoralis	89
Dalea purpurea	83	30	Solidago rigida	76
Erigeron strigosus	59	3	Sorghastrum nutans*	62
Euphorbia corollata	92	40	Sporobolus heterolepis	79
Hedeoma hispida	61	9	Stipa spartea*	91
Helianthus laetiflorus	65	25	Tradescantia ohiensis	50
Helianthus occidentalis	42	12	Viola pedata	50
Koeleria cristata	45	4	Viola pedatifida*	45

Reference Site:

To be determined.

Spring Green



Konza (for patterning)



hill prairie



Notes, Relevance to Site, and Possible Restoration Trajectories

(See Mesic Prairie)

Oak Opening:

As defined by Curtis, this is an oak-dominated savanna community in which there is less than 50% tree canopy. Historically, oak openings occurred on wet-mesic to dry sites. The few extant remnants are mostly on drier sites, with the mesic and wet-mesic openings almost totally destroyed by conversion to agricultural or residential uses, and by the encroachment of other woody plants due to fire suppression. Bur, white, and black oaks (*Quercus macrocarpa*, *Q. alba* and *Q. velutina*) are dominant in mature stands as large, open-grown trees with distinctive limb architecture. Shagbark hickory (*Carya ovata*) is sometimes present. American hazelnut (*Corylus americana*) is a common shrub, and while the herb layer is similar to those found in oak forests and prairies, with many of the same grasses and forbs present, there are some plants and animals that reach their optimal abundance in the “openings”. (WDNR)

Curtis “Oak Opening” (excluding taxa not native to Milwaukee County)	(continued)	
Bur Oak (<i>Q. macrocarpa</i>) IV 105	Quaking Aspen (<i>P. tremuloides</i>)	IV 5
Black Oak (<i>Q. velutina</i>) IV 72	Red Oak (<i>Q. rubra</i>)	IV 4
White Oak (<i>Q. alba</i>) IV 62	Green Ash (<i>F. pennsylvanica</i>)	IV 2
Shagbark Hickory (<i>C. ovata</i>) IV 20	Red Elm (<i>U. rubra</i>)	IV 2
Hill’s Oak (<i>Q. ellipsoidalis</i>) IV 9	Red Cedar (<i>Juniperus virginiana</i>)	IV 1
Black Cherry (<i>Prunus serotina</i>) IV 7	Ash-leaved Maple (<i>Acer negundo</i>)	IV 1
Paper Birch (<i>Betula papyrifera</i>) IV 6	...	

Reference Site: Genessee Depot SNA

Genessee Depot



Pleasant Valley Conservancy



Pleasant Valley Conservancy, Black Earth, WI. (Driftless (unglaciated) area). Left slope faces south, as does more gradual slope in foreground; both are prairie and savanna dominated. Confirmed with land manager Tom Brock that early quantitative transects, pre-management, showed the sun/shade vegetation differences very clearly (degraded prairie remnants on the south-facing slope; woodland spring ephemerals on the north-facing slope). Their management techniques have, however, enhanced the differences. Management including prescribed burns have been most intense on the south-facing slopes.

Notes, Relevance to Site, and Possible Restoration Trajectories

Establishment of oak opening can be seen as a transition from prairie (*see Mesic Prairie establishment*) to the growth of savanna trees and the shift in herbaceous flora to respond to the light gradients.

Trees can be individually planted, ideally in a range of age classes. Prescribed fire is hoped to be used (as well as for prairie areas), and for some time, young trees will need protection during fire. Prairie species can include sun-tolerant savanna specialists, and management will need to supplementally incorporate a fuller complement of savanna-specialist species. Pruksa 1995 provides oak savanna indicator species (specialists).

Southern Dry Forest:

Oaks are the dominant species in this upland forest community of dry sites. White oak (*Quercus alba*) and black oak (*Quercus velutina*) are dominant, often with admixtures of red and bur oaks (*Q. rubra* and *Q. macrocarpa*) and black cherry (*Prunus serotina*). In the well developed shrub layer, brambles (*Rubus* spp.), gray dogwood (*Cornus racemosa*), and American hazelnut (*Corylus americana*) are common. Frequent herbaceous species are wild geranium (*Geranium maculatum*), false Solomon's-seal (*Smilacina racemosa*), hog-peanut (*Amphicarpaea bracteata*), and woodland sunflower (*Helianthus strumosus*). (WDNR)

Curtis "Dry forest":

(excluding taxa not native to Milwaukee County)

Black Oak (<i>Q. velutina</i>)	IV 98
White Oak (<i>Q. alba</i>)	IV 80
Bur Oak (<i>Q. macrocarpa</i>)	IV 26
Black Cherry (<i>Prunus serotina</i>)	IV 23
Red Oak (<i>Q. rubra</i>)	IV 22
Hill's Oak (<i>Q. ellipsoidalis</i>)	IV 11
Shagbark Hickory (<i>C. ovata</i>)	IV 8
American Elm (<i>U. americana</i>)	IV 4
Red Elm (<i>U. rubra</i>)	IV 4
Black Walnut (<i>Juglans nigra</i>)	IV 3
Chinquapin Oak (<i>Q. muhlenbergii</i>)	IV 3
...	

Curtis "Dry-mesic forest":

(excluding taxa not native to Milwaukee County)

Red Oak (<i>Q. rubra</i>)	IV 104
White Oak (<i>Q. alba</i>)	IV 52
Basswood (<i>Tilia americana</i>)	IV 29
Sugar Maple (<i>Acer saccharum</i>)	IV 23
Red Elm (<i>Ulmus rubra</i>)	IV 17
White Ash (<i>F. americana</i>)	IV 11
Ironwood (<i>Ostrya virginiana</i>)	IV 9
Shagbark Hickory (<i>Carya ovata</i>)	IV 9
Large-toothed Aspen (<i>P. grandidentata</i>)	IV 7
Black Cherry (<i>Prunus serotina</i>)	IV 6
Black Oak (<i>Q. velutina</i>)	IV 6
Red Maple (<i>A. rubrum</i>)	IV 5
...	

Reference Site:

Oak forest at Wehr Nature Center?

To be determined.

(photo: Virginia Kline, WDNR)



Pleasant Valley Conservancy



Parnell Esker



Notes, Relevance to Site, and Possible Restoration Trajectories

(See Mesic Forest)

PRELIMINARY WORK-WITHIN BUDGET

Airline Yards Vegetation Restoration											
4 November 2009 updated nma											
Category	Item	Qty	Unit		Unit Cost Low	Unit Cost High	Base Cost Low	Base Cost High	Low With 15%	High With 15%	
Bid Management											
Still assumes two primary implementation packages. However, this might be better managed as more smaller contracted tasks -- overhead in mgmt higher, task costs lower.											
Two packages is the minimum practical, in my opinion. Second could be extended with same contractor, but also gives the opportunity for adjustment.											
Two packages could be geographic (west end, then east end), or habitat types, or sequenced phases.											
I am raising these bid mgmt costs due to the suggested complexity in the landscapes that the grading now affords. We are aiming for maximum biodiversity.											
Bid Specs/Package one											
	e.g. Aten	80	Hr		\$40	\$80	\$3,200	\$6,400	\$3,700	\$7,400	
	Contracted assistance on equipment rates contractor	40	Hr		\$120	\$120	\$4,800	\$4,800	\$5,600	\$5,600	
Bid Management	I.e. Rivet	30	Hr		\$120	\$120	\$3,600	\$3,600	\$4,200	\$4,200	
Bid Specs/Package two											
	e.g. Aten	60	Hr		\$40	\$80	\$2,400	\$4,800	\$2,800	\$5,600	
	Contracted assistance on equipment rates contractor	30	Hr		\$120	\$120	\$3,600	\$3,600	\$4,200	\$4,200	
Bid Management	I.e. Rivet	30	Hr		\$120	\$120	\$3,600	\$3,600	\$4,200	\$4,200	
Construction											
	Mobilization	2	Annual		\$20,000	\$40,000	\$40,000	\$80,000	\$46,000	\$92,000	
	Landscape Onsite Oversight (e.g. Aten)	24	Active Weeks	288	Hours	\$40	\$80	\$11,520	\$23,040	\$13,300	\$26,500
	Construction Oversight (e.g. Rivet)								\$62,695	\$118,875	
Based on prior estimates by MTP; could include pumps (river) for temp irrigation, site marking, storage											
Est. 5% construction costs											
Zones in preliminary plan											
	Oak Savanna	G	S	2.2	Acres						
	Black Oak Savanna	G	S	0.8	Acres						
	Dry Forest	F		2.8	Acres						
	Mesic Forest	F		3.9	Acres						
	Dry Prairie	G		1.6	Acres						
	Mesic Prairie	G		3.3	Acres						
	Northern Forest	F		0.6	Acres						
	Edible Landscape	F		0.2	Acres						
	Grassy Field	O		1.4	Acres						
	South Ravines	G	S	0.5	Acres						
	North Ravines	F	S	0.3	Acres						
	River Cut	W	S	1.3	Acres						
	Kettles	F	S	0.4	Acres						
	Comm Gardens	O	C	0.9	Acres						
				20.2							
RESTATED (some overlap)											
Includes cover crop if done at same time											
Includes seed or plants and labor, mechanical seeding											
	Grasslands			8.4	Acres			\$3,000	\$9,000	\$25,200	\$75,600
	Key Woody			5.5	Acres	266	900 SF/per 30ft	\$300	\$600	\$79,860	\$159,720
								\$200	\$200	\$53,240	\$53,240
								\$6,000	\$18,000	\$49,200	\$147,600
	Forest Herbs			8.2	Acres			\$10	\$20	\$142,877	\$285,754
	Forest Woody			8.2	Acres	14,288	25 SF / per 5ft	\$200	\$600	\$178,596	\$535,788
						893	400 SF / per 20'	\$200	\$200	\$178,596	\$178,596
								\$1,000	\$2,000	\$8,200	\$16,400
								\$3,000	\$5,000	\$6,900	\$11,500
	Open			2.3	Acres			\$3,750	\$11,250	\$4,875	\$14,625
	Wetland-type			1.3	Acres			\$15	\$40	\$16,988	\$45,302
						1,133	Half, 25SF / 5ft	\$2	\$5	\$25,168	\$62,920
						12,584	Half, every 18"			\$10,000	\$30,000
	Special/Constr			0.9	Acres					\$11,500	\$34,500
	Cover crop phasing allowance			10.1	Acres			\$3,000	\$3,000	\$30,300	\$30,300
										\$34,900	\$34,900
Labor, and allow for various types of cover crop											
Riverbank Management Areas											
	Invasive exotic care			1400	LF	2,800	Hours / 2 hr/LF	\$75	\$100	\$210,000	\$280,000
	Supplemental small planting			4	Acres	6,970	25 SF / per 5ft	\$10	\$20	\$69,696	\$139,392
										\$80,200	\$160,400
										\$1,400,595	\$2,646,075
Low/High including bid docs and construction+mgmt											

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	Latin (PLANTS database)	Common (PLANTS database)	BP	IL	IL	IL	Lapham's Latin (sic)	Lapham's Common
	http://plants.usda.gov		95	36	38	40	Eaton's Manual of Botany	(sic)
	Nancy M. Aten, April 2003							
	Comparing Increase Lapham's Milwaukee Floras of 1836-1840 with modern understanding of oak savanna indicator species (Pruka)							
	Species marked "?" - Unclear from Lapham latin/common names and habitat. Vouchers not checked.							
	Notations are PruKa indicator category (BP 1995), and Lapham flora inclusion (IL 1836, 1838, 1840).							
	Leftmost column indicates exotic species.							
	<i>Acer rubrum</i>	Red Maple			x		<i>Acer rubrum</i>	Red maple
	<i>Acer spicatum</i>	Mountain Maple				x	<i>Acer spicatum</i>	Mountain maple
	<i>Achillea millefolium</i>	Common Yarrow			x		<i>Achillea millefolium</i>	Milfoil
	<i>Acorus calamus</i>	Calamus				x	<i>Acorus calamus</i>	Sweet flag
	<i>Actaea pachypoda</i>	White Baneberry			x		<i>Actaea alba</i>	White cohosh
	<i>Adiantum pedatum</i>	Northern Maidenhair			x		<i>Adiantum pedatum</i>	Maiden hair
	<i>Agalinis tenuifolia</i>	Slenderleaf False Foxglove				x	<i>Gerardia tenuifolia</i>	
	<i>Ageratina aromatica</i>	Lesser Snakeroot			x		<i>Eupatorium aromaticum</i>	
	<i>Agrimonia eupatoria</i>	Churchsteeples			x		<i>Agrimonia Eupatoria</i>	Agrimony
	<i>Alisma plantago-aquatica</i>	American Waterplantain				x	<i>Alisma plantago</i>	Water plantain
	<i>Allium canadense</i>	Meadow Garlic			x		<i>Allium Canadense</i>	Meadow garlic
	<i>Allium cernuum</i>	Nodding Onion	2			x	<i>Allium cernuum</i>	
	<i>Allium tricoccum</i>	Wild Leek				x	<i>Allium tricoccum</i>	
	<i>Alnus serrulata</i>	Hazel Alder				x	<i>Alnus serrulata</i>	Alder
ex	<i>Alopecurus geniculatus</i>	Water Foxtail				x	<i>Alopecurus geniculatus</i>	
	<i>Ambrosia artemisiifolia</i> var. <i>elatior</i>	Annual Ragweed				x	<i>Ambrosia eleator</i>	Hog weed
	<i>Ambrosia trifida</i>	Great Ragweed				x	<i>Ambrosia trifida</i>	Bitter weed
	<i>Amorpha canescens</i>	Lead plant	2	x			<i>Amorpha canescens</i>	Lead plant
	<i>Amphicarpaea bracteata</i>	American Hogpeanut				x	<i>Amphicarpa monoica</i>	Wild bean
	<i>Andropogon gerardii</i>	Big Bluestem	2			x	<i>Andropogon furcatus</i>	
	<i>Anemone virginiana</i>	Tall Thimbleweed	1	x			<i>Anemone Virginiana</i>	Wind flower
	<i>Angelica atropurpurea</i>	Purplestem Angelica				x	<i>Archangelica atropurpurea</i>	
ex	<i>Anthemis cotula</i>	Stinking Chamomile				x	<i>Anthemis cotula</i>	May weed
	<i>Apios americana</i>	Groundnut				x	<i>Apios tuberosa</i>	Indian potatoe
	<i>Apocynum androsaemifolium</i>	Spreading Dogbane				x	<i>Apocynum androsaemifolium</i>	Dog bane
	<i>Apocynum cannabinum</i>	Indianhemp			x		<i>Apocynum cannabinum</i>	
	<i>Aquilegia canadensis</i>	Red Columbine			x		<i>Aquilegia Canadensis</i>	Wild columbine
	<i>Arabis canadensis</i>	Sicklepod				x	<i>Arabis Canadensis</i>	sickle pod
	<i>Arabis hirsuta</i>	Hairy Rockcross				x	<i>Arabis hirsuta</i>	
	<i>Arabis laevigata</i>	Smooth Rockcross				x	<i>Arabis laevigata</i>	
	<i>Arabis lyrata</i>	Lyrate Rockcross				x	<i>Arabis lyrata</i>	
	<i>Aralia nudicaulis</i>	Wild Sarsaparilla				x	<i>Aralia nudicaulis</i>	Wild sarsaparilla
	<i>Aralia racemosa</i>	American Spikenard				x	<i>Aralia racemosa</i>	Spikenard
ex	<i>Arctium lappa</i>	Greater Burdock			x		<i>Arctium lappa</i>	Burr dock
	<i>Arctostaphylos uva-ursi</i>	Kinnikinnick				x	<i>Arbutus uva-ursi</i>	Bear berry
	<i>Argentina anserina</i>	Silverweed Cinquefoil				x	<i>Potentilla ansera</i>	Tansej cinquefoil
	<i>Arnoglossum atriplicifolium</i>	Pale Indian Plantain	1			x	<i>Cacalia atriplicifolia</i>	
	<i>Asarum canadense</i>	Canadian Wildginger				x	<i>Asarum Canadense</i>	False colt foot
	<i>Asclepias exaltata</i>	Poke Milkweed	2	x			<i>Asclepias phytolaccoides</i>	
	<i>Asclepias incarnata</i>	Swamp Milkweed				x	<i>Asclepias incarnata</i>	
	<i>Asclepias syriaca</i>	Common Milkweed				x	<i>Asclepias Syriaca</i>	Milk weed
	<i>Asclepias tuberosa</i>	Butterfly Milkweed	2	x			<i>Asclepias tuberosa</i>	Butterfly weed
ex	<i>Asparagus officinalis</i>	Garden Asparagus				x	<i>Asparagus officinalis</i>	Asparagus
	<i>Astragalus canadensis</i>	Canadian Milkvetch	1			x	<i>Astragalus Canadensis</i>	Milk vetch
	<i>Astragalus neglectus</i>	Cooper's Milkvetch				x	<i>Phacca neglecta</i>	
	<i>Baptisia alba</i>	Wild White Indigo				x	<i>Baptisia alba</i>	Prairie indigo
	<i>Betula papyrifera</i>	Paper Birch			x		<i>Betula papyracea</i>	Canoe birch
	<i>Betula pumila</i>	Bog Birch				x	<i>Betula pumila</i>	Dwarf birch
	<i>Betula pumila</i> var. <i>glandulifera</i>	Bog Birch				x	<i>Betula grandulosa</i>	Scrub birch
	<i>Bidens frondosa</i>	Devil's Beggartick				x	<i>Bidens frondosa</i>	Burr marygold
	<i>Botrychium virginianum</i>	Rattlesnake Fern			x		<i>Botrychium virginicum</i>	Rattle snake fern
ex	<i>Brassica nigra</i>	Black Mustard				x	<i>Sinapis nigra</i>	Mustard
	<i>Bromus ciliatus</i>	Fringed Brome	2	x			<i>Bromus ciliatus</i>	
	<i>Bromus purgans</i>	Hairy Woodland Brome				x	<i>Bromus purgans</i>	
	<i>Calamagrostis canadensis</i>	Bluejoint				x	<i>Calamagrostis Canadensis</i>	
	<i>Calla palustris</i>	Water Arum				x	<i>Calla palustris</i>	Water arum
	<i>Caltha palustris</i>	Yellow Marsh Marigold				x	<i>Caltha palustris</i>	American cowslip
	<i>Calystegia sepium</i>	Hedge False Bindweed				x	<i>Convolvulus repens</i>	
	<i>Calystegia sepium</i> ssp. <i>angulata</i>	Hedge False Bindweed				x	<i>Convolvulus repens</i>	Field bind weed
	<i>Calystegia spithamea</i>	Low False Bindweed	1	x			<i>Convolvulus spithameus</i>	Dwarf morning glory
	<i>Campanula rotundifolia</i>	Bluebell Bellflower				x	<i>Campanula rotundifolia</i>	Hair bell
	<i>Campanulastrum americanum</i>	Small American Bellflower				x	<i>Campanula Americana</i>	
ex	<i>Capsella bursa-pastoris</i>	Sheperd's Purse				x	<i>Capsella bur a-pastoris</i>	Sheperd's purse
	<i>Cardamine bulbosa</i>	Bulbous Bittercress				x	<i>Arabis rhomboidea</i>	Spring cress
	<i>Cardamine concatenata</i>	Cutleaf Toothwort				x	<i>Dentaria laciniata</i>	
	<i>Cardamine pennsylvanica</i>	Pennsylvania Bittercress				x	<i>Cardamine Pennsylvanica</i>	

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	http://plants.usda.gov		95	36	38	40	Eaton's Manual of Botany	(sic)
	<i>Cardamine pratensis</i>	Cuckoo Flower				x	<i>Cardamine pratensis</i>	
	<i>Carex albicans</i>	Whiteninge Sedge				x	<i>Carex varia</i>	
	<i>Carex aurea</i>	Golden Sedge				x	<i>Carex aurea</i>	
	<i>Carex buxbaumii</i>	Buxbaum's Sedge				x	<i>Carex Buxbaumii</i>	
	<i>Carex deweyana</i>	Dewey Sedge				x	<i>Carex Deweyana</i>	
	<i>Carex disperma</i>	Softleaf Sedge				x	<i>Carex disperma</i>	
	<i>Carex eburnea ?</i>	Bristleleaf Sedge				x	<i>Carex alba</i>	
	<i>Carex gracillima</i>	Graceful Sedge				x	<i>Carex gracillima</i>	
	<i>Carex granularis</i>	Limestone Meadow Sedge				x	<i>Carex granularis</i>	
	<i>Carex hystericina</i>	Bottlebrush Sedge				x	<i>Carex hystericina</i>	
	<i>Carex lacustris</i>	Hairy Sedge				x	<i>Carex lacustris</i>	
	<i>Carex laxiflora</i>	Broad Looseflower Sedge			x		<i>Carex anceps</i>	
	<i>Carex leptalea ?</i>	Bristlystalked Sedge				x	<i>Carex polytrichoides</i>	
	<i>Carex limosa</i>	Mud Sedge				x	<i>Carex limosa</i>	
	<i>Carex lupulina</i>	Hop Sedge			x		<i>Carex lupulina</i>	
	<i>Carex muehlenbergii</i>	Muhlenberg's Sedge			x		<i>Carex Muhlenbergii</i>	
	<i>Carex nigra</i>	Smooth Black Sedge				x	<i>Carex acuta</i>	
	<i>Carex pellita</i>	Woolly Sedge				x	<i>Carex pellita</i>	
	<i>Carex pseudocyperus</i>	Cypresslike Sedge				x	<i>Carex pseudo-cyperus</i>	
	<i>Carex retroflexa ?</i>	Reflexed Sedge				x	<i>Carex retroflexa</i>	
	<i>Carex rosea</i>	Rosy Sedge			x		<i>Carex rosea</i>	
	<i>Carex stipata</i>	Owlfruit Sedge				x	<i>Carex stipata</i>	
	<i>Carex straminea</i>	Eastern Straw Sedge				x	<i>Carex straminea</i>	
	<i>Carex tetanica ?</i>	Rigid Sedge			x		<i>Carex tentaculata</i>	
	<i>Carpinus caroliniana</i>	American Hornbeam				x	<i>Carpinus Americana</i>	Blue beech
	<i>Castilleja coccinea</i>	Scarlet Indian Paintbrush	1			x	<i>Euchroma coccinea</i>	Painted cup
	<i>Caulophyllum thalictroides</i>	Blue Cohosh				x	<i>Caulophyllum thalictroides</i>	False cohosh
	<i>Ceanothus americanus</i>	New Jersey Tea	1			x	<i>Ceanothus Americana</i>	New Jersey tea
	<i>Celastris scandens</i>	False bitter-sweet				x	<i>Celastris scandens</i>	False bitter-sweet
	<i>Chelone glabra</i>	White Turtlehead				x	<i>Chelone glabra</i>	Snake head
	<i>Chenopodium capitatum</i>	Blite Goosefoot				x	<i>Blitum capitatum</i>	Indian strawberry
	<i>Cicuta bulbifera</i>	Bulblet-bearing Water Hemlock				x	<i>Cicuta bulbifera</i>	
	<i>Cicuta maculata</i>	Spotted Water Hemlock				x	<i>Cicuta maculata</i>	
	<i>Cinna arundinacea</i>	Sweet Woodreed				x	<i>Cinna arundinacea</i>	
	<i>Circaea alpina</i>	Small Enchanter's Nightshade			x		<i>Circaea alpina</i>	
	<i>Circaea lutetiana</i>	Broadleaf Enchanter's Nightshade			x		<i>Circaea lutetiana</i>	Enchanter's night-shade
	<i>Claytonia virginica</i>	Virginia Springbeauty				x	<i>Claytonia Virginia</i>	Spring beauty
	<i>Clematis virginiana</i>	Devil's Darning Needles				x	<i>Clematis Virginia</i>	Virgin's bower
	<i>Clintonia borealis</i>	Bluebead				x	<i>Dracaena borealis</i>	Wild lily of the valley
	<i>Collinsia verna</i>	Spring Blue Eyed Mary				x	<i>Collinsia verna</i>	
	<i>Comarum palustre</i>	Purple Marshlocks			x		<i>Comarum palustre</i>	Marsh five finger
	<i>Conopholis americana</i>	American Squawroot				x	<i>Orobanche Americana</i>	
	<i>Conyza canadensis</i>	Canadian Horseweed				x	<i>Erigeron Canadense</i>	Flea bane
	<i>Coptis trifoliata</i>	Threeleaf Goldthread				x	<i>Coptis trifoliata</i>	Gold thread
	<i>Coreopsis palmata</i>	Stiff Tickseed	2			x	<i>Coreopsis palmata</i>	
	<i>Cornus canadensis</i>	Bunchberry Dogwood				x	<i>Cornus Canadensis</i>	Low dogwood
	<i>Cornus racemosa</i>	Gray Dogwood				x	<i>Cornus paniculata</i>	Bush dogwood
	<i>Corylus americana</i>	American Hazelnut				x	<i>Corylus Americana</i>	Hazle nut
	<i>Crataegus chrysocarpa</i>	Fireberry Hawthorn				x	<i>Crataegus coccinea</i>	
	<i>Crataegus punctata</i>	Dotted Hawthorn				x	<i>Crataegus punctata</i>	Thorn apple
	<i>Cryptotaena canadensis</i>	Canadian Honewort				x	<i>Cryptotaena Canadensis</i>	
	<i>Cuscuta gronovii ?</i>	Scaldweed			x		<i>Cuscuta Americana</i>	Love vine
	<i>Cynoglossum virginianum</i>	Wild Comfrey				x	<i>Cynoglossum Virginicum</i>	
	<i>Cyperus diandrus</i>	Umbrella Flatsedge				x	<i>Cyperus diandrus</i>	
	<i>Cypripedium acaule</i>	Moccasin Flower				x	<i>Cypripedium acaule</i>	Low ladies' slipper
	<i>Cypripedium candidum</i>	White Lady's Slipper				x	<i>Cypripedium candidum</i>	White ladies slip'r
	<i>Cypripedium pubescens</i>	Greater Yellow Lady's Slipper	1			x	<i>Cypripedium pubescens</i>	Ladies' slipper
	<i>Dalea candida</i>	White Prairie Clover	2			x	<i>Petalostemon candidum</i>	
	<i>Danthonia spicata</i>	Poverty Oatgrass				x	<i>Danthonia spicata</i>	
ex	<i>Datura stramonium</i>	Jimsonweed				x	<i>Datura stramonium</i>	Jamestown weed
	<i>Dichanthelium dichotomum</i>	Cypress Panicgrass				x	<i>Panicum nitidum</i>	Panic grass
	<i>Dichanthelium latifolium</i>	Broadleaf Rosette Grass	2			x	<i>Panicum latifolium</i>	
	<i>Dichanthelium scoparium</i>	Velvet Panicum				x	<i>Panicum scoparium</i>	
	<i>Dicranum scoparium</i>	Dicranum Moss				x	<i>Dicranum scoparium</i>	Moss
	<i>Dicranum undulatum</i>	Undulate Dicranum Moss				x	<i>Dicranum undulatum</i>	
	<i>Diervilla lonicera</i>	Northern Bush Honeysuckle				x	<i>Diervilla Canadensis</i>	Bush honeysuckle
	<i>Dioscorea villosa</i>	Wild Yam				x	<i>Dioscorea villosa</i>	Yam root
	<i>Dirca palustris</i>	Eastern Leatherwood				x	<i>Dirca palustris</i>	Leatherwood
	<i>Dodecatheon meadia ?</i>	Shooting Star	1			x	<i>Dodecatheon integrifolium</i>	Shooting star
	<i>Drosera rotundifolia</i>	Roundleaf Sundew				x	<i>Drosera rotundifolia</i>	Sun dew
ex	<i>Echinochloa crus-galli</i>	Barnyardgrass				x	<i>Panicum crus-galli</i>	Barn grass
	<i>Elymus canadensis</i>	Canada Wildrye				x	<i>Elymus Canadensis</i>	
	<i>Elymus hystrix</i>	Eastern Bottlebrush Grass				x	<i>Elymus hystrix</i>	

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	<i>Elymus virginicus</i>	Virginia Wildrye	1			x	<i>Elymus Virginicus</i>	Wild rye
	<i>Enemion biternatum</i>	Eastern False Rue Anemone				x	<i>Isopyrum thalictroides</i>	
	<i>Epifagus virginiana</i>	Beechdrops				x	<i>Epiphegus Virginianus</i>	Beech drop
	<i>Epilobium palustre</i>	Marsh Willowherb			x		<i>Epilobium lineare</i>	
	<i>Epilobium palustre</i>	Marsh Willowherb			x		<i>Epilobium palustre</i>	
	<i>Equisetum arvense</i>	Field Horsetail				x	<i>Equisetum arvense</i>	Horse tail
	<i>Equisetum fluviatile</i>	Water Horsetail				x	<i>Equisetum limosum</i>	
	<i>Equisetum hymale</i>	Scouringrush Horsetail			x		<i>Equisetum hymale</i>	Scouring rush
	<i>Equisetum palustre</i>	Marsh Horsetail			x		<i>Equisetum palustre</i>	
	<i>Erigenia bulbosa</i>	Harbinger of Spring				x	<i>Erigenia bulbosa</i>	
	<i>Erigeron philadelphicus</i>	Philadelphia Fleabane				x	<i>Erigeron purpureum</i>	
	<i>Erigeron pulchellus</i>	Robin's Plantain	1			x	<i>Erigeron bellidifolium</i>	Robert's plantain
	<i>Erigeron strigosus</i>	Prairie Fleabane			x		<i>Erigeron strigosus</i>	
	<i>Erythronium albidum</i>	White Fawnlily				x	<i>Erythronium albidum</i>	
	<i>Erythronium americanum</i>	Dogtooth Violet				x	<i>Erythronium Americanum</i>	Adder's tongue
	<i>Euonymus atropurpurea</i>	Eastern Wahoo				x	<i>Euonymus atropurpureus</i>	Spindle tree
	<i>Eupatorium perfoliatum</i>	Common Boneset				x	<i>Eupatorium perfoliatum</i>	Thorough wort
	<i>Eupatorium purpureum</i>	Sweet-scented Joepyeweed	2			x	<i>Eupatorium purpureum</i>	Trumpet weed
	<i>Euphorbia corollata</i>	Flowering Spurge	2			x	<i>Euphorbia corollata</i>	
	<i>Eurybia macrophylla</i>	Bigleaf Aster				x	<i>Aster macrophyllus</i>	
	<i>Fagus grandifolia</i>	American Beech				x	<i>Fagus ferruginea</i>	Red beech
ex	<i>Fagus sylvatica</i>	European Beech				x	<i>Fagus sylvatica</i>	White beech
	<i>Festuca paradoxa</i>	Clustered Fescue				x	<i>Festuca nutans</i>	
	<i>Floerkea proserpinacoides</i>	False Mermaidweed				x	<i>Floerkea uliginosa</i>	False mermaid
	<i>Fragaria virginiana</i>	Virginia Strawberry				x	<i>Fragaria Virginiana</i>	Wild strawberry
	<i>Fraxinus americana</i>	White Ash				x	<i>Fraxinus acuminata</i>	White ash
	<i>Fraxinus nigra</i>	Black Ash				x	<i>Fraxinus sambucifolia</i>	Black ash
	<i>Galearis spectabilis</i>	Showy Orchid				x	<i>Orchis spectabilis</i>	Gay orchis
	<i>Galium aparine</i>	Stickywilly				x	<i>Galium aparine</i>	Goose grass
	<i>Galium asprellum</i>	Rough Bedstraw				x	<i>Galium asprellum</i>	Rough bed straw
	<i>Galium boreale</i>	Northern Bedstraw	2			x	<i>Galium boreale</i>	
	<i>Galium lanceolatum</i>	Lanceleaf Wild Licorice				x	<i>Galium lanceolatum</i>	
	<i>Galium tinctorium</i>	Stiff Marsh Bedstraw				x	<i>Galium tinctorium</i>	
	<i>Galium trifidum</i>	Threepetal Bedstraw				x	<i>Galium trifidum</i>	Bed straw
	<i>Galium triflorum</i>	Fragrant Bedstraw				x	<i>Galium triflorum</i>	
	<i>Gamochoaeta americana</i>	American Everlasting				x	<i>Gnaphalium Americanum</i>	
	<i>Gaultheria hispidula</i>	Creeping Snowberry				x	<i>Gaultheria hispidula</i>	
	<i>Gaultheria procumbens</i>	Eastern Teaberry				x	<i>Gaultheria procumbens</i>	Winter green
	<i>Gentiana saponaria</i>	Harvestbells				x	<i>Gentiana saponaria</i>	Soap gentian
	<i>Gentianella quinquefolia</i>	Agueweed	2			x	<i>Gentiana quinquefolia</i>	
	<i>Gentianopsis crinita</i>	Greater Fringed Gentian				x	<i>Gentiana crinata</i>	Fringed gentian
	<i>Geranium carolinianum</i>	Carolina Geranium				x	<i>Geranium Carolinianum</i>	
	<i>Geranium maculatum</i>	Spotted Geranium				x	<i>Geranium maculatum</i>	Crane's bill
	<i>Geum aleppicum</i>	Yellow Avens				x	<i>Geum strictum</i>	Avens
	<i>Geum rivale</i>	Purple Avens				x	<i>Geum rivale</i>	
	<i>Geum triflorum</i>	Old Man's Whiskers	2			x	<i>Geum triflorum</i>	
	<i>Geum virginianum</i>	Cream Avens				x	<i>Geum Virginianum</i>	
	<i>Goodyera pubescens</i>	Downy Rattlesnake Plantain				x	<i>Goodyera pubescens</i>	
	<i>Habenaria bracteata</i>	Longbract Frog Orchid				x	<i>Habenaria bracteata</i>	
	<i>Habenaria huronensis</i>	Huron Green Orchid				x	<i>Habenaria huronensis</i>	
	<i>Hamamelis virginiana</i>	American Witchhazel				x	<i>Hamamelis Virginica</i>	Witch hazle
	<i>Helenium autumnale</i>	Common Sneezeweed				x	<i>Helenium autumnale</i>	False sunflower
	<i>Helianthus strumosus</i>	Paleleaf Woodland Sunflower				x	<i>Helianthus strumosus</i>	Wild sunflower
	<i>Hepatica nobilis var. acuta</i>	Sharplobe Hepatica				x	<i>Hepatica acutiloba</i>	Liverwort
	<i>Heraclium maximum</i>	Common Cowparsnip				x	<i>Heraclium lanatum</i>	Cow parsnip
	<i>Heuchera americana</i>	American Alumroot	1			x	<i>Heuchera Americana</i>	Alum root
	<i>Hieracium gronovii</i>	Queendevil				x	<i>Hieracium Gronovii</i>	
	<i>Hieracium Kalmii</i>	Kalm's Hawkweed				x	<i>Hieracium Kalmii</i>	
	<i>Hierochloa hirta</i>	Northern Sweetgrass				x	<i>Hierochloa borealis</i>	Seneca grass
ex	<i>Hippophae rhamnoides</i>	Seabuckthorn				x	<i>Hippophae Canadensis</i>	Sea buck thorn
	<i>Humulus lupulus</i>	Common Hop				x	<i>Humulus lupulus</i>	Hop
	<i>Huperzia lucidula</i>	Shining Clubmoss				x	<i>Lycopodium lucidulum</i>	Ground pine
	<i>Hydrastis canadensis</i>	Goldenseal				x	<i>Hydrastis Canadensis</i>	Orange root
	<i>Hydrophyllum virginianum</i>	Shawnee Salad				x	<i>Hydrophyllum Virginicum</i>	Burr flower
	<i>Hypoxis hirsuta</i>	Common Goldstar	1			x	<i>Hypoxis erecta</i>	Star grass
	<i>Ilex verticillata</i>	Common Winterberry				x	<i>Prinos verticillatus</i>	Winter berry
	<i>Impatiens capensis</i>	Jewelweed				x	<i>Impatiens fulva</i>	Jewel weed
	<i>Impatiens pallida</i>	Pale Touch-me-not				x	<i>Impatiens pallida</i>	
	<i>Iris lacustris</i>	Dwarf Lake Iris				x	<i>Iris lacustris</i>	
	<i>Iris versicolor</i>	Harlequin Blueflag				x	<i>Iris versicolor</i>	Blue flag
	<i>Jeffersonia diphylla</i>	Twinleaf				x	<i>Jeffersonia diphylla</i>	Twin leaf
	<i>Juglans cinerea</i>	Butternut				x	<i>Juglans cinerea</i>	Butternut
	<i>Juglans nigra</i>	Black Walnut				x	<i>Juglans nigra</i>	Black walnut

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			95	36	38	40		
	<i>Juncus tenuis</i>	Poverty Rush			x		<i>Juncus tenuis</i>	
	<i>Juniperus communis</i>	Common Juniper				x	<i>Juniperus communis</i>	Juniper
	<i>Juniperus virginiana</i>	Eastern Redcedar		x			<i>Juniperus Virginiana</i>	Red cedar
	<i>Koeleria macrantha</i>	Prairie Junegrass			x		<i>Koeleria nitida</i>	
	<i>Laportea canadensis</i>	Canadian Woodnettle		x			<i>Urtica Canadensis</i>	
	<i>Larix laricina</i>	Tamarack		x			<i>Pinus pendula</i>	Tamarack
	<i>Lathyrus japonicus</i> var. <i>maritimus</i>	Beach Pea		x			<i>Lathyrus maritimus</i>	Beach pea
	<i>Lathyrus palustris</i>	Marsh Pea			x		<i>Lathyrus myrtifolius</i>	
	<i>Lathyrus venosus</i>	Veiny Pea	2			x	<i>Lathyrus venosus</i>	
	<i>Leersia oryzoides</i>	Rice Cutgrass				x	<i>Leersia oryzoides</i>	Rice grass
	<i>Leersia virginica</i>	Whitegrass	2			x	<i>Leersia Virginica</i>	
	<i>Lemna minor</i>	Common Duckweed				x	<i>Lemna minor</i>	Duck's meet
	<i>Lemna trisulca</i>	Star Duckweed				x	<i>Lemna trisulea</i>	
	<i>Lepidium virginicum</i>	Virginia Pepperweed		x			<i>Lepidium Virginicum</i>	Wild pepper grass
	<i>Lespedeza capitata</i>	Roundhead Lespedeza				x	<i>Lespedeza capitata</i>	
	<i>Liatris scariosa</i>	Devil's Bite				x	<i>Liatris scariosa</i>	
	<i>Liatris spicata</i>	Dense Blazing Star				x	<i>Liatris spicata</i>	
	<i>Lilium canadense</i>	Canada Lily		x			<i>Lilium Canadense</i>	Nodding lily
	<i>Lilium philadelphicum</i>	Wood Lily	1	x			<i>Lilium Philadelphiaicum</i>	Red lily
	<i>Linnaea borealis</i>	Twinflower		x			<i>Linnaea borealis</i>	Twin flower
	<i>Lithospermum canescens</i>	Hoary Puccoon	2	x			<i>Batschia canescens</i>	Puccoon
	<i>Lobelia cardinalis</i>	Cardinalflower			x		<i>Lobelia cardinalis</i>	Cardinal flower
	<i>Lobelia inflata</i>	Indian-tobacco		x			<i>Lobelia inflata</i>	Indian tobacco
	<i>Lobelia siphilitica</i>	Great Blue Lobelia		x			<i>Lobelia siphilitica</i>	
	<i>Lonicera flava</i>	Yellow Honeysuckle				x	<i>Lonicera flavens</i>	
	<i>Lupinus perennis</i>	Sundial Lupine				x	<i>Lupinus perennis</i>	Wild lupine
	<i>Luzula acuminata</i>	Hairy Woodrush				x	<i>Luzula pilosa</i>	
	<i>Lycopodium complanatum</i>	Groundcedar				x	<i>Lycopodium complanatum</i>	
	<i>Lycopus virginicus</i>	Virginia Water Horehound		x			<i>Lycopus Virginicus</i>	Bugle weed
	<i>Lysimachia ciliata</i>	Fringed Loosestrife		x			<i>Lysimachia ciliata</i>	Money wort
	<i>Lysimachia quadrifolia</i>	Whorled Yellow Loosestrife	1	x			<i>Lysimachia quadrifolia</i>	
	<i>Lysimachia thrysiflora</i>	Tufted Loosestrife				x	<i>Lysimachia thrysiflora</i>	
	<i>Lythrum hyssopifolia</i>	Hyssop Loosestrife				x	<i>Lythrum hyssopifolium</i>	Grass poley
	<i>Maianthemum canadense?</i>	Canada Mayflower				x	<i>Majanthemum bifolium</i>	
	<i>Maianthemum racemosum</i>	Feathery False Lily of the Valley		x			<i>Convallaria racemosa</i>	
	<i>Maianthemum stellatum</i>	Starry False Lily of the Valley		x			<i>Convallaria stellata</i>	
	<i>Maianthemum trifolium</i>	Threeleaf False Lily of the Valley				x	<i>Smilacina trifoliata</i>	
	<i>Malus coronaria</i>	Sweet Crabapple				x	<i>Pyrus coronaria</i>	Crab apple
	<i>Marchantia polymorpha</i>	Liverwort				x	<i>Marchantia polymorpha</i>	Brook liverwort
	<i>Melampyrum lineare</i>	Narrowleaf Cowwheat				x	<i>Melampyrum Americanum</i>	Cow wheat
	<i>Menyanthes trifoliata</i>	Buckbean				x	<i>Menyanthus trifoliata</i>	Buck bean
	<i>Milium effusum</i>	American Milletgrass				x	<i>Milium effusum</i>	Millet
	<i>Mimulus ringens</i>	Allegheny Monkeyflower		x			<i>Mimulus ringens</i>	Monkey flower
	<i>Minuartia michauxii</i> var. <i>michauxii</i>	Michaux's Stitchwort				x	<i>Arenaria stricta</i>	
	<i>Mitchella repens</i>	Partridgeberry				x	<i>Mitchella repens</i>	Partridge berry
	<i>Mitella diphylla</i>	Twoleaf Miterwort				x	<i>Mitella diphylla</i>	Currant leaf
	<i>Moehringia lateriflora</i>	Bluntleaf Sandwort	2			x	<i>Arenaria lateriflora</i>	
	<i>Mollugo verticillata</i>	Green Carpetweed				x	<i>Mollugo verticillata</i>	Carpet weed
	<i>Monarda didyma</i>	Scarlet Beebalm				x	<i>Monarda didyma</i>	Wild balm
	<i>Monotropa uniflora</i>	Indianpipe				x	<i>Monotropa uniflora</i>	Indian pipe
	<i>Muhlenbergia tenuiflora</i>	Slender Muhly				x	<i>Agrostis tenuiflora</i>	
	<i>Myriophyllum verticillatum</i>	Whorl-leaf Watermilfoil				x	<i>Myriophyllum verticillatum</i>	Water milfoil
ex	<i>Nepeta cataria</i>	Catnip				x	<i>Nepeta cataria</i>	Cat nip
	<i>Nuphar lutea</i>	Yellow Pond Lily				x	<i>Nuphar advena</i>	Yellow water lily
	<i>Nymphaea odorata</i>	American White Waterlily				x	<i>Nymphaea odorata</i>	White pond lily
	<i>Oenothera biennis</i>	Common Evening-primrose	1	x			<i>Oenothera biennis</i>	Scabish
	<i>Oligoneuron riddellii</i>	Riddell's Goldenrod				x	<i>Solidago Riddellii</i>	
	<i>Oligoneuron rigidum</i>	Stiff Goldenrod				x	<i>Solidago rigida</i>	
	<i>Onoclea sensibilis</i>	Sensitive Fern				x	<i>Onoclea sensibilis</i>	Sensitive fern
	<i>Orbexilum onobrychis</i>	French-grass				x	<i>Psoralea onobrychis</i>	
	<i>Orthilia secunda</i>	Sidebells Wintergreen				x	<i>Pyrola secunda</i>	
	<i>Oryzopsis asperifolia</i>	Roughleaf Ricegrass				x	<i>Oryzopsis asperifolia</i>	Mountain rice
	<i>Osmorhiza claytonii</i>	Clayton's Sweetroot				x	<i>Uraspermum Claytonii</i>	Sweet cicily
	<i>Osmunda cinnamomea</i>	Cinnamon Fern				x	<i>Osmunda cinnamomea</i>	
	<i>Osmunda claytoniana</i>	Interrupted Fern				x	<i>Osmunda interrupta</i>	
	<i>Ostrya virginiana</i>	Hophornbeam				x	<i>Ostrya Virginia</i>	Iron wood
	<i>Oxalis stricta</i>	Common Yellow Oxalis				x	<i>Oxalis stricta</i>	Wood sorrel
	<i>Packera aurea</i>	Golden Ragwort				x	<i>Senecio aureus</i>	Rag wort
	<i>Panax trifolius</i>	Dwarf Ginseng				x	<i>Panax trifolia</i>	Ground nut
	<i>Panicum capillare</i>	Witchgrass				x	<i>Panicum capillare</i>	
	<i>Parietaria pensylvanica</i>	Pennsylvania Pellitory				x	<i>Parietaria Pennsylvania</i>	
	<i>Parnassia glauca</i>	Fen Grass of Parnassus				x	<i>Parnassia Americana</i>	
	<i>Parthenocissus quinquefolia</i>	Virginia Creeper				x	<i>Ampelopsis quinquefolia</i>	Creeper

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			95	36	38	40		
ex	<i>Pastinaca sativa</i>	Wild Parsnip			x		<i>Pastinaca ativa</i>	Parsnip
	<i>Pedicularis canadensis</i>	Canadian Lousewort	1	x			<i>Pedicularis Canadensis</i>	Louse wort
ex	<i>Pennisetum glaucum</i>	Peal Millet				x	<i>Penisetum glaucum</i>	Fox tail panic grass
	<i>Penthorum sedoides</i>	Ditch Stonecrop				x	<i>Penthorum sedoides</i>	Virginia orpine
	<i>Phlox divaricata</i>	Wild Blue Phlox				x	<i>Phlox divaricata</i>	
	<i>Phryma leptostachya</i>	American Lopseed				x	<i>Phryma leptostachya</i>	Lop seed
	<i>Physocarpus opulifolius</i>	Common Ninebark		x			<i>Spiraea apulifolia</i>	Nine bark
	<i>Physostegia virginiana</i>	Obedient Plant		x			<i>Dracocephalum Virginianum</i>	dragon head
	<i>Pilea pumila</i>	Canadian Clearweed				x	<i>Urtica pumila</i>	
	<i>Pinus strobus</i>	Eastern White Pine				x	<i>Pinus strobus</i>	White pine
	<i>Piptatherum racemosum</i>	Blackseed Ricegrass				x	<i>Piptaterum racemosum</i>	
	<i>Plantago cordata</i>	Heartleaf Plantain		x			<i>Plantago cordata</i>	Water plantain
	<i>Plantago major</i>	Common Plantain		x			<i>Plantago major</i>	Plantain
	<i>Platanthera ciliaris</i>	Yellow Fringed Orchid				x	<i>Habenaria ciliaris</i>	Orchis
	<i>Platanthera grandiflora</i>	Greater Purple Fringed Orchid		x			<i>Habenaria fimbriata</i>	
	<i>Platanthera orbiculata</i>	Lesser Roundleaved Orchid				x	<i>Platanthera orbiculata</i>	
	<i>Platanus occidentalis</i>	American Sycamore				x	<i>Platinus occidentalis</i>	Sycamore
ex	<i>Poa pratensis</i>	Kentucky Bluegrass				x	<i>Poa pratensis</i>	Spear grass
ex	<i>Poa trivialis</i>	Rough Bluegrass				x	<i>Poa trivialis</i>	Pasture grass
	<i>Podophyllum peltatum</i>	Mayapple		x			<i>Podophyllum peltatum</i>	May apple
	<i>Polemonium reptans</i>	Green Valerian	1		x		<i>Polemonium reptans</i>	
	<i>Polygonatum biflorum</i>	Solomon's Seal				x	<i>Polygonatum multiflorum</i>	Solomon's seal
	<i>Polygala senega</i>	Seneca Snakeroot	1	x			<i>Polygala Senega</i>	Seneca snake root
	<i>Polygonatum biflorum</i>	Smooth Solomon's Seal		x			<i>Convallaria bifolia</i>	
	<i>Polygonum amphibium</i>	Water Knotweed				x	<i>Polygonum amphibicum</i>	
	<i>Polygonum amphibium</i> var. <i>emersum</i>	Longroot Smartweed				x	<i>Polygonum coccineum</i>	Lake knot weed
ex	<i>Polygonum aviculare</i>	Prostrate Knotweed		x			<i>Polygonum aviculare</i>	Knot grass
ex	<i>Polygonum convolvulus</i>	Black Bindweed				x	<i>Polygonum convolvulus</i>	
	<i>Polygonum persicaria</i>	Spotted Ladysthumb				x	<i>Polygonum persicaria</i>	
	<i>Polygonum punctatum</i>	Dotted Smartweed				x	<i>Polygonum punctatum</i>	Smart weed
	<i>Polygonum virginianum</i>	Jumpseed				x	<i>Polygonum Virginianum</i>	
	<i>Polymnia canadensis</i>	Whiteflower Leafcup		x			<i>Polymna Canadensis</i>	White leaf cup
	<i>Polytrichum commune</i>	Polytrichum Moss				x	<i>Polytrichum commune</i>	
	<i>Populus grandidentata</i>	Bigtooth Aspen				x	<i>Populus grandidentata</i>	
	<i>Populus tremuloides</i>	Quaking Aspen		x			<i>Populus tremuloides</i>	White poplar
	<i>Potamogeton gramineus</i>	Variableleaf Pondweed				x	<i>Potamogeton gramineum</i>	
	<i>Potamogeton zosteriformis</i>	Flatstem Pondweed				x	<i>Potamogeton zosterifolium</i>	
	<i>Potentilla arguta</i>	Tall Cinquefoil	2			x	<i>Potentilla arguta</i>	
	<i>Potentilla canadensis</i>	Dwarf Cinquefoil		x			<i>Potentilla Canadensis</i>	Five finger
	<i>Potentilla norvegica</i>	Norwegian Cinquefoil				x	<i>Potentilla Norwegica</i>	
	<i>Prenanthes alba</i>	White Rattlesnakeroot	1		x		<i>Prenanthes alba</i>	White lettuce
	<i>Prunella vulgaris</i>	Common Selfheal				x	<i>Prunella vulgaris</i>	Heal all
	<i>Prunus americana</i>	American Plum				x	<i>Prunus Americana</i>	plum
	<i>Prunus serotina</i>	Black Cherry				x	<i>Prunus serotina</i>	Choke cherry
	<i>Prunus virginiana</i>	Chokecherry				x	<i>Prunus Virginiana</i>	Wild cherry
	<i>Ptelea trifoliata</i>	Common Hoptree				x	<i>Ptelia trifoliata</i>	
	<i>Pulsatilla patens</i> ssp. <i>multifida</i>	Cutleaf Anemone	2			x	<i>Anemone patens</i>	
	<i>Pycnanthemum virginianum</i>	Virginia mountainmint	2	x			<i>Pycnanthemum Virginianum</i>	Thyme
	<i>Pyrola americana</i>	American Wintergreen				x	<i>Pyrola rotundifolia</i>	Shin leaf
	<i>Quercus alba</i>	White Oak				x	<i>Quercus alba</i>	White oak
	<i>Quercus macrocarpa</i>	Bur Oak				x	<i>Quercus macrocarpa</i>	Burr oak
	<i>Quercus rubra</i>	Northern Red Oak				x	<i>Quercus rubra</i>	Red oak
	<i>Quercus velutina</i>	Black Oak				x	<i>Quercus tinctoria</i>	Black oak
	<i>Ranunculus abortivus</i>	Littleleaf Buttercup				x	<i>Ranunculus abortivus</i>	
	<i>Ranunculus fascicularis</i>	Early Buttercup	1			x	<i>Ranunculus fascicularis</i>	
	<i>Ranunculus pensylvanicus</i>	Pennsylvania Buttercup				x	<i>Ranunculus Pennsylvanicus</i>	
	<i>Ranunculus recurvatus</i>	Blisterwort				x	<i>Ranunculus recurvatus</i>	
ex	<i>Ranunculus repens</i>	Creeping Buttercup				x	<i>Ranunculus repens</i>	
	<i>Ranunculus rhomboideus</i>	Labrador Buttercup	1			x	<i>Ranunculus rhomboideus</i>	
	<i>Rhamnus alnifolia</i>	Alderleaf Buckthorn				x	<i>Rhamnus alnifolius</i>	
	<i>Rhus glabra</i>	Smooth Sumac		x			<i>Rhus glabra</i>	Sumach
	<i>Rhus typhina</i>	Staghorn Sumac				x	<i>Rhus typhina</i>	
	<i>Ribes lacustre</i>	Prickly Currant				x	<i>Ribes lacustris</i>	Goose berry
	<i>Ribes oxycanthoides</i>	Canadian gooseberry				x	<i>Ribes oxycanthoides</i>	Smoothe gooseberry
	<i>Ribes triste</i>	Red Currant				x	<i>Ribes rubrum</i>	Wild red currant
	<i>Rubus idaeus</i>	American Red Raspberry		x			<i>Rubus ideus</i>	Raspberry
	<i>Rubus idaeus</i> ssp. <i>strigosus</i>	Grayleaf Red Raspberry				x	<i>Rubus strigosus</i>	Red raspberry
	<i>Rubus trivialis</i>	Southern Dewberry				x	<i>Rubus trivialis</i>	Dew berry
	<i>Rudbeckia hirta</i>	Blackeyed Susan				x	<i>Rudbeckia hirta</i>	
	<i>Rudbeckia laciniata</i>	Cutleaf Coneflower				x	<i>Rudbeckia laciniata</i>	Cone flower
	<i>Rudbeckia pinnata</i>	Pinnate Prairie Coneflower		x			<i>Rudbeckia pinnata</i>	
ex	<i>Rumex acetosella</i>	Common Sheep Sorrel				x	<i>Rumex acetocellus</i>	Sorrel
	<i>Rumex altissimus</i>	Pale Dock				x	<i>Rumex Britannicus</i>	

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ex	<i>Rumex crispus</i>	Curly Dock				x	<i>Rumex crispus</i>	Dock
	<i>Salix humilis</i>	Prairie Willow			x		<i>Salix conifera</i>	Cone gall willow
	<i>Sambucus nigra</i> ssp. <i>canadensis</i>	Common Elderberry		x			<i>Sambucus Canadensis</i>	Elder
	<i>Sanguinaria canadensis</i>	Bloodroot		x			<i>Sanguinaria Canadensis</i>	Blood root
	<i>Sanicula marylandica</i>	Maryland Sanicle		x			<i>Sanicula Marylandica</i>	Sanicle
	<i>Saxifraga pensylvanica</i>	Eastern Swamp Saxifrage		x			<i>Saxifraga Pennsylvanica</i>	Water saxifrage
	<i>Schizachne purpurascens</i>	False Melic				x	<i>Trisetum purpurascens</i>	
	<i>Schizachyrium scoparium</i>	Little Bluestem	2			x	<i>Andropogon scoparius</i>	
	<i>Schoenoplectus acutus</i>	Hardstem Bulrush				x	<i>Scirpus lacustris</i>	
	<i>Schoenoplectus heterochaetus</i>	Slender Bulrush			x		<i>Scirpus tenuis</i>	
	<i>Scirpus atrovirens</i>	Green Bulrush				x	<i>Scirpus atrovirens</i>	
	<i>Scrophularia marylandica</i>	Carpenter's Square		x			<i>Scrophularia Marylandica</i>	Fig wort
	<i>Scutellaria galericulata</i>	Marsh Skullcap			x		<i>Scutellaria galericulata</i>	Scull cap
	<i>Scutellaria lateriflora</i>	Blue Skullcap		x			<i>Scutellaria lateriflora</i>	Mad dog scull cap
	<i>Scutellaria ovata</i>	Heartleaf Skullcap		x			<i>Scutellaria cordifolia</i>	
	<i>Scutellaria parvula</i>	Small Skullcap			x		<i>Scutellaria parvula</i>	
	<i>Silene antirrhina</i>	Sleepy Silene			x		<i>Silene antirrhina</i>	Sleepy catch fly
	<i>Silene caroliniana</i> ssp. <i>pennsylvanica</i>	Pennsylvania Catchfly				x	<i>Silene Pennsylvanic</i>	
	<i>Silphium perfoliatum</i>	Cup Plant			x		<i>Silphium connatum</i>	
	<i>Silphium terebinthenaceum</i>	Prairie Rosinweed			x		<i>Silphium terebinthenaceum</i>	Prairie dock
	<i>Sisyrinchium angustifolium</i>	Narrowleaf Blue-eyed Grass		x			<i>Sisyrinchium Bermudianum</i>	
	<i>Sium latifolium</i>	Wideleaf Waterparsnip		x			<i>Sium latifolium</i>	Water parsnip
	<i>Smilax herbacea</i>	Smooth Carrionflower				x	<i>Smilax herbacea</i>	
	<i>Solanum nigrum</i>	Black Nightshade		x			<i>Solanum nigrum</i>	Deadly night shade
	<i>Solidago caesia</i>	Wreath Goldenrod		x			<i>Solidago axillaris</i>	
	<i>Solidago canadensis</i>	Canada Goldenrod		x			<i>Solidago Canadensis</i>	Golden rod
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod		x			<i>Solidago latifolia</i>	
	<i>Solidago gigantea</i>	Giant Goldenrod				x	<i>Solidago gigantea</i>	
	<i>Sorghastrum nutans</i>	Indiangrass	2		x		<i>Andropogon nutans</i>	Beard's grass
	<i>Sphagnum capillifolium</i>	Sphagnum			x		<i>Sphagnum acutifolium</i>	Peat moss
	<i>Spiraea salicifolia</i>	Willowleaf Meadowsweet			x		<i>Spiraea salicifolia</i>	Meadow sweet
	<i>Spiranthes cernua</i>	Nodding Ladies'-tresses			x		<i>Neottia cernua</i>	Ladies' tresses
	<i>Spiranthes lacera</i> var. <i>gracilis</i>	Northern Slender Ladies'-tresses				x	<i>Neottia gracilis</i>	
ex	<i>Stachys sylvatica</i>	Whitespot		x			<i>Stachys sylvatica</i>	
	<i>Stellaria palustris</i>	Meadow Starwort		x			<i>Stellaria palustris</i>	Stitch wort
	<i>Streptopus lanceolatus</i>	Twistedstalk				x	<i>Streptopus roseus</i>	
	<i>Symphoricarpos albus</i> var. <i>albus</i>	Common Snowberry		x			<i>Symphoria racemosa</i>	Snowberry
	<i>Symphyotrichum cordifolium</i>	Common Blue Wood Aster				x	<i>Aster cordifolius</i>	
	<i>Symphyotrichum laeve</i>	Smooth Blue Aster	2			x	<i>Aster laevis</i>	
	<i>Symphyotrichum novae-angliae</i>	New England Aster		x			<i>Aster nova-Angliae</i>	
	<i>Symphyotrichum novi-belgii</i>	New York Aster		x			<i>Aster novi-Belgii</i>	
	<i>Symphyotrichum puniceum</i>	Purplestem Aster			x		<i>Aster puniceus</i>	
	<i>Symphyotrichum sericeum</i>	Western Silver Aster	2			x	<i>Aster sericeus</i>	
	<i>Symphyotrichum shortii</i>	Short's Aster	2	x			<i>Aster Shortii</i>	
	<i>Symplocarpus foetidus</i>	Skunk Cabbage		x			<i>Ictodes foetida</i>	Skunk cabbage
ex	<i>Taraxacum officinale</i>	Common Dandelion			x		<i>Leontodon taraxacum</i>	Dandelion
	<i>Taxus canadensis</i>	Canada Yew			x		<i>Taxus Canadensis</i>	Dwarf yew
	<i>Teucrium canadense</i>	Canada Germander			x		<i>Teucrium Canadense</i>	Germander
	<i>Thalictrum dioicum</i>	Early Meadow-rue		x			<i>Thalyctrum dioicum</i>	Meadow rue
	<i>Thalictrum revolutum</i>	Waxyleaf Meadow-rue			x		<i>Thalyctrum revolutum</i>	
	<i>Thalictrum thalictroides</i>	Rue Anemone	2		x		<i>Anemone thalictroides</i>	Rue anemone
	<i>Thuja occidentalis</i>	Arborvitae			x		<i>Cupressus thyoides</i>	White cedar
	<i>Tilia americana</i>	American Basswood			x		<i>Tilia glabra</i>	Brss wood
	<i>Tofieldia glutinosa</i>	Sticky Tofieldia			x		<i>Tofieldia glutinosa</i>	
	<i>Toxicodendron pubescens</i>	Atlantic Poison Oak				x	<i>Rhus toxicodendron</i>	
	<i>Toxicodendron vernix</i>	Poison Sumac			x		<i>Rhus ve nix</i>	Poison vine
	<i>Tradescantia virginiana</i>	Virginia Spiderwort		x			<i>Tradescantia Virginica</i>	Spider wort
	<i>Trientalis borealis</i> ssp. <i>borealis</i>	Starflower		x			<i>Trientalis Americana</i>	Chick winter green
	<i>Trillium erectum</i>	Red Trillium			x		<i>Trillium erectum</i>	Birth wort
	<i>Trillium nivale</i>	Dwarf White Wakerobin			x		<i>Trillium nivale</i>	
	<i>Triosetum perfoliatum</i>	Feverwort	1			x	<i>Triosetum perfoliatum</i>	Horse gingeng
	<i>Triosteum angustifolium</i>	Yellowfruit Horse-gentian				x	<i>Triosteum angustifolium</i>	
	<i>Typha latifolia</i>	Broadleaf Cattail			x		<i>Typha latifolia</i>	Cat tail
	<i>Ulmus americana</i>	American Elm			x		<i>Ulmus Americana</i>	Elm
	<i>Ulmus rubra</i>	Slippery Elm			x		<i>Ulmus fulva</i>	Slippery elm
	<i>Urtica dioica</i>	Stinging Nettle		x			<i>Urtica dioica</i>	Nettle
	<i>Uvularia grandiflora</i>	Largeflower Bellwort		x			<i>Uvularia grandiflora</i>	
	<i>Vaccinium macrocarpon</i>	Cranberry				x	<i>Oxycoccus macrocarpus</i>	Cranberry
	<i>Vallisneria americana</i>	American Eelgrass				x	<i>Vallisneria spiralis</i>	Tape grass
ex	<i>Verbascum thapsis</i>	Common Mullein				x	<i>Verbascum thapsis</i>	Mullein
	<i>Verbena hastata</i>	Swamp Verbena		x			<i>Verbena hastata</i>	Vervain
	<i>Verbena urticifolia</i>	White Vervain				x	<i>Verbena urticifolia</i>	
	<i>Veronica anagallis-aquatica</i>	Water Speedwell		x			<i>Veronica anagalis</i>	Brook pimpernel

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<i>Veronica peregrina</i>	Neckweed			x		<i>Veronica peregrina</i>	Purslane speedwell
<i>Veronica scutellata</i>	Skullcap Speedwell				x	<i>Veronica scutellata</i>	
<i>Veronicastrum virginicum</i>	Culver's Root	1	x			<i>Leptandria Virginica</i>	Culver's physic
<i>Viburnum acerfolium</i>	Mapleleaf Viburnum		x			<i>Viburnum acerfolium</i>	Dockmackie
<i>Viburnum dentatum</i>	Southern Arrowwood		x			<i>Viburnum pubescens</i>	
<i>Viburnum opulus</i> var. <i>americanum</i>	American Cranberrybush			x		<i>Viburnum oxycoccus</i>	High cranberry
<i>Viburnum prunifolium</i>	Blackhaw			x		<i>Viburnum prunicifolium</i>	Black hawe
<i>Vicia americana</i>	American Vetch			x		<i>Vicia Americana</i>	
<i>Vicia cracca</i>	Bird Vetch			x		<i>Vicia cracca</i>	Tufted vetch
<i>Viola blanda</i>	Sweet White Violet			x		<i>Viola blanda</i>	
<i>Viola cucullata</i>	Marsh Blue Violet		x			<i>Viola cucullata</i>	Blue violet
<i>Viola palmata</i>	Early Blue Violet			x		<i>Viola palmata</i>	
<i>Viola pubescens</i>	Downy Yellow Violet		x			<i>Viola pubescens</i>	Yellow violet
<i>Vitis riparia</i>	Riverbank Grape		x			<i>Vitis vulpina</i>	Frost grape
<i>Xanthium strumarium</i>	Rough Cockleburr				x	<i>Xanthium strumarium</i>	Clott burr
<i>Zanthoxylum americanum</i>	Common Pricklyash			x		<i>Xanthoxylum fraxineum</i>	Prickly ash
<i>Zizania aquatica</i>	Annual Wildrice		x			<i>Zizania aquatica</i>	Wild rice
<i>Zizia aurea</i>	Golden Zizia	1	x			<i>Zizia aurea</i>	Alexanders
?			x			<i>Acer saccharinum</i>	Sugar maple
?			x			<i>Anemone acontifolia</i>	
?				x		<i>Anemone nemerosa</i>	Low anemone
?				x		<i>Aronia arbutifolia</i>	Red choke berry
?				x		<i>Aronia botryapium</i>	June berry
?			x			<i>Arum tryphyllum</i>	Indian turnip
?				x		<i>Asclepias obtusifolia</i>	
?			x			<i>Aspidium angustum</i>	
?				x		<i>Aspidium asplenoides</i>	
?				x		<i>Aspidium bulbosum</i>	
?			x			<i>Asplenium angustifolium</i>	
?			x			<i>Asplenium thelypteroides</i>	
?				x		<i>Aster amygdalinus</i>	
?					x	<i>Aster corymbosum</i>	
?					x	<i>Aster ledifolius</i>	
?			x			<i>Bidens chrysanthemoides</i>	Beggar ticks
?				x		<i>Cacalia lanceolata</i>	
?			x			<i>Campanula erinoides</i>	Prickly bell flower
?				x		<i>Carex bullata</i>	
?					x	<i>Carex stellulata</i>	
?			x			<i>Carya alba</i>	Shag bark hickory
?			x			<i>Carya sulcata</i>	Shell bark hickory
?				x		<i>Chenopodium rhombifolium</i>	
?					x	<i>Chrysopsis alba</i>	
?				x		<i>Cistus Canadensis</i>	rock rose
?			x			<i>Cnicus discolor</i>	
?					x	<i>Cnicus muticus</i>	
?					x	<i>Conioselinum Canadense</i>	
?			x			<i>Convallaria multiflora</i>	
?				x		<i>Corydalis Canadensis</i>	
?					x	<i>Corydalis cucullaria</i>	Colic weed
?			x			<i>Cucubalus stellatus</i>	
?				x		<i>Cypripedium spectabile</i>	Moccasin flower
?			x			<i>Dicksonia pilosiusulca</i>	
?				x		<i>Epilobium spicatum</i>	Willow herb
?					x	<i>Equisetum uliginosum</i>	
?					x	<i>Eriophorum polystachyon</i>	Cotton grass
?					x	<i>Eryngium aquaticum</i>	Rattle snake master
?					x	<i>Euchroma grandiflora</i>	
?			x			<i>Eupatorium verticillatum</i>	Joe Pye's weed
?					x	<i>Glyceria fluitans</i>	
?					x	<i>Gnaphalium polycephalum</i>	
?					x	<i>Gymnandra Houghtoniana</i>	
?					x	<i>Gyroma Virginica</i>	
?			x			<i>Hedysarum acuminatum</i>	
?				x		<i>Hedysarum Canadense</i>	Bush trefoil
?				x		<i>Helianthus altissimus</i>	
?			x			<i>Heliopsis laevis</i>	Ox eye
?				x		<i>Hordium jubatum</i>	Squirrel tail grass
?					x	<i>Hypericum corymbosum</i>	
?				x		<i>Hypnum spendens</i>	Moss
?					x	<i>Hypnum triquetrum</i>	
?					x	<i>Hyssopus scrophularifolius</i>	
?					x	<i>Juncus polycephalus</i>	
?					x	<i>Koeleria truncata</i>	

Latin (PLANTS database) http://plants.usda.gov	Common (PLANTS database)	BP 95	IL 36	IL 38	IL 40	Lapham's Latin (sic) Eaton's Manual of Botany	Lapham's Common (sic)
?				x		<i>Krigia amplexicaulis</i>	
?					x	<i>Lactuca elongata</i>	Wild lettuce
?					x	<i>Lathyrus albidus</i>	Wild pea
?				x		<i>Liatris quarrosa</i>	
?					x	<i>Limnetis cynosuroides</i>	Salt grass
?				x		<i>Lobelia claytoniana</i>	
?					x	<i>Lonicera parviflora</i>	Honey suckle
?					x	<i>Lupinus decumbens</i>	Wild lupine
?					x	<i>Luzula campestris</i>	
?					x	<i>Lycopodium apodium</i>	
?				x		<i>Lysimachia revoluta</i>	
?					x	<i>Mentha borealis</i>	Mint
?					x	<i>Mitella cordifolia</i>	
?					x	<i>Momordica echinata</i>	Prickly cucumber
?					x	<i>Muhlenbergia erecta</i>	
?					x	<i>Nasturtium hispidum</i>	
?					x	<i>Pentstemon pubescens</i>	Beard's tongue
?					x	<i>Petalostemon violaceum</i>	
?					x	<i>Phlox aristat</i>	
?				x		<i>Physalis viscosa</i>	Ground cherry
?					x	<i>Poa nervata</i>	
?					x	<i>Poa serotina</i>	
?					x	<i>Polygala purpurea</i>	
?					x	<i>Polypogon racemosum</i>	
?				x		<i>Potamogeton nutans</i>	Pond weed
?				x		<i>Potentilla hirsuta</i>	
?				x		<i>Pteris aqualina</i>	Break
?				x		<i>Pteris atropurpurea</i>	Rock break
?					x	<i>Ranunculus fluviatilis</i>	
?					x	<i>Ranunculus hirsutus</i>	Butter cup
?					x	<i>Ranunculus multifidus</i>	
?					x	<i>Ribes floridum</i>	Wild black currant
?					x	<i>Rochella lappula</i>	
?					x	<i>Rosa parviflora</i>	Wild rose
?					x	<i>Rubus triflorus</i>	
?				x		<i>Rubus villosus</i>	Back berry
?				x		<i>Sagittaria sagitifolia</i>	Arrow head
?					x	<i>Scirpus capitatus</i>	
?					x	<i>Scirpus lineatus</i>	
?					x	<i>Scirpus triqueter</i>	
?					x	<i>Silphium gumniferum</i>	
?					x	<i>Sisymbrium canescens</i>	
?					x	<i>Sisyrinchium anceps</i>	Blue eyed grass
?					x	<i>Smilax peduncularis</i>	Jacob's ladder
?					x	<i>Solidago lanceolata</i>	
?					x	<i>Sparganium ramosum</i>	
?					x	<i>Sphagnum latifolium</i>	
?					x	<i>Stipa juncea</i>	
?					x	<i>Thaspium cordatum</i>	
?					x	<i>Thesium umbellatum</i>	
?					x	<i>Trichodium laxiflorum</i>	
?					x	<i>Trillium pendulum</i>	
?					x	<i>Triticum pauciflorum</i>	Wild wheat
?					x	<i>Troxymon cuspidatum</i>	
?					x	<i>Udora Canadensis</i>	Ditch moss
?				x		<i>Uraspermum hirsutum</i>	
?				x		<i>Utricularia ceratophylla</i>	Hooded milfoil
?					x	<i>Vaccinium Pennsylvanicum</i>	Whortleberry
?					x	<i>Vaccinium resinum</i>	Black whortle berry
?					x	<i>Valeriana Samplesii</i>	
?					x	<i>Viola muhlenbergiana</i>	
?					x	<i>Xylosteum ciliatum</i>	Fly honey suckle
?					x	<i>Zizia integerrima</i>	

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Native Flora of Milwaukee County						
From Larry Leitner, SEWRPC, April 2006						
Y	<i>Acalypha rhomboidea</i>	Euphorbiaceae				
Y	<i>Acer negundo</i>	Aceraceae				
Y	<i>Acer nigrum</i>	Aceraceae				
Y	<i>Acer rubrum</i>	Aceraceae				
Y	<i>Acer saccharinum</i>	Aceraceae				
Y	<i>Acer saccharum</i>	Aceraceae				
Y	<i>Acer spicatum</i>	Aceraceae				U
Y	<i>Achillea millefolium</i>	Asteraceae				
Y	<i>Acorus americanus</i>	Acoraceae				U
Y	<i>Actaea pachypoda</i>	Ranunculaceae				
Y	<i>Actaea rubra</i>	Ranunculaceae				
Y	<i>Adiantum pedatum</i>	Polypodiaceae				
Y	<i>Adlumia fungosa</i>	Fumariaceae			SC	
Y	<i>Aesculus glabra</i>	Hippocastanaceae				
Y	<i>Agalinis gattingeri</i>	Scrophulariaceae			THR	
Y	<i>Agalinis purpurea</i>	Scrophulariaceae				
Y	<i>Agalinis tenuifolia</i>	Scrophulariaceae				
Y	<i>Agastache scrophulariaefolia</i>	Lamiaceae				U
Y	<i>Agrimonia gryposepala</i>	Rosaceae				
Y	<i>Agrimonia pubescens</i>	Rosaceae				
Y	<i>Agropyron trachycaulum</i>	Poaceae				
Y	<i>Agrostis hyemalis</i>	Poaceae				
Y	<i>Alisma subcordatum</i>	Alismataceae				
Y	<i>Alisma triviale</i>	Alismataceae				
Y	<i>Allium canadense</i>	Liliaceae				
Y	<i>Allium cernuum</i>	Liliaceae				U
Y	<i>Allium tricoccum</i>	Liliaceae				
Y	<i>Alnus rugosa</i>	Betulaceae				
Y	<i>Alopecurus aequalis</i>	Poaceae				
Y	<i>Amaranthus albus</i>	Amaranthaceae				
Y	<i>Amaranthus retroflexus</i>	Amaranthaceae				
Y	<i>Amaranthus tuberculatus</i>	Amaranthaceae				
Y	<i>Ambrosia artemisiifolia</i>	Asteraceae				
Y	<i>Ambrosia psilostachya</i>	Asteraceae				
Y	<i>Ambrosia trifida</i>	Asteraceae				
Y	<i>Amelanchier laevis</i>	Rosaceae				
Y	<i>Amelanchier sanguinea</i>	Rosaceae				
Y	<i>Amelanchier spicata</i>	Rosaceae				
Y	<i>Ammophila brevifolulata</i>	Poaceae				U
Y	<i>Amorpha canescens</i>	Fabaceae				U
Y	<i>Amphicarpa bracteata</i>	Fabaceae				
Y	<i>Andromeda glaucophylla</i>	Ericaceae				U
Y	<i>Andropogon gerardii</i>	Poaceae				
Y	<i>Andropogon scoparius</i>	Poaceae				
Y	<i>Anemone canadensis</i>	Ranunculaceae				
Y	<i>Anemone cylindrica</i>	Ranunculaceae				
Y	<i>Anemone patens</i>	Ranunculaceae				U
Y	<i>Anemone quinquefolia</i>	Ranunculaceae				
Y	<i>Anemone virginiana</i>	Ranunculaceae				
Y	<i>Anemonella thalictroides</i>	Ranunculaceae				U
Y	<i>Angelica atropurpurea</i>	Apiaceae				
Y	<i>Antennaria neglecta</i>	Asteraceae				
Y	<i>Antennaria parlinii</i>	Asteraceae				
Y	<i>Antennaria plantaginifolia</i>	Asteraceae				
Y	<i>Apios americana</i>	Fabaceae				
Y	<i>Aplectrum hyemale</i>	Orchidaceae			SC	
Y	<i>Apocynum androsaemifolium</i>	Apocynaceae				
Y	<i>Apocynum cannabinum</i>	Apocynaceae				
Y	<i>Apocynum sibiricum</i>	Apocynaceae				
Y	<i>Aquilegia canadensis</i>	Ranunculaceae				
Y	<i>Arabis canadensis</i>	Brassicaceae				
Y	<i>Arabis glabra</i>	Brassicaceae				
Y	<i>Arabis hirsuta</i>	Brassicaceae				U
Y	<i>Arabis laevigata</i>	Brassicaceae				
Y	<i>Arabis lyrata</i>	Brassicaceae				
Y	<i>Arabis shortii</i>	Brassicaceae			SC	
Y	<i>Aralia hispida</i>	Araliaceae				
Y	<i>Aralia nudicaulis</i>	Araliaceae				U
Y	<i>Aralia racemosa</i>	Araliaceae				U
Y	<i>Arctostaphylos uva-ursi</i>	Ericaceae				U

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Arenaria lateriflora</i>	Caryophyllaceae				
Y	<i>Arisaema dracontium</i>	Araceae				U
Y	<i>Arisaema triphyllum</i>	Araceae				
Y	<i>Aristida oligantha</i>	Poaceae				
Y	<i>Aronia prunifolia</i>	Rosaceae				
Y	<i>Artemisia caudata</i>	Asteraceae				
Y	<i>Artemisia dracunculus</i>	Asteraceae			SC	
Y	<i>Artemisia ludoviciana</i>	Asteraceae				
Y	<i>Asarum canadense</i>	Aristolochiaceae				
Y	<i>Asclepias amplexicaulis</i>	Asclepiadaceae				U
Y	<i>Asclepias exaltata</i>	Asclepiadaceae				
Y	<i>Asclepias incarnata</i>	Asclepiadaceae				
Y	<i>Asclepias ovalifolia</i>	Asclepiadaceae			THR	
Y	<i>Asclepias purpurascens</i>	Asclepiadaceae			END	
Y	<i>Asclepias syriaca</i>	Asclepiadaceae				
Y	<i>Asclepias tuberosa</i>	Asclepiadaceae				U
Y	<i>Asclepias verticillata</i>	Asclepiadaceae				
Y	<i>Asclepias viridiflora</i>	Asclepiadaceae				U
Y	<i>Aster azureus</i>	Asteraceae				
Y	<i>Aster borealis</i>	Asteraceae				
Y	<i>Aster ciliolatus</i>	Asteraceae				
Y	<i>Aster cordifolius</i>	Asteraceae				
Y	<i>Aster drummondii</i>	Asteraceae				
Y	<i>Aster ericoides</i>	Asteraceae				
Y	<i>Aster firmus</i>	Asteraceae				
Y	<i>Aster furcatus</i>	Asteraceae			THR	
Y	<i>Aster laevis</i>	Asteraceae				
Y	<i>Aster lateriflorus</i>	Asteraceae				
Y	<i>Aster macrophyllus</i>	Asteraceae				
Y	<i>Aster novae-angliae</i>	Asteraceae				
Y	<i>Aster ontarionis</i>	Asteraceae				
Y	<i>Aster pilosus</i>	Asteraceae				
Y	<i>Aster prenanthoides</i>	Asteraceae				U
Y	<i>Aster ptarmicoides</i>	Asteraceae				
Y	<i>Aster puniceus</i>	Asteraceae				
Y	<i>Aster sagittifolius</i>	Asteraceae				
Y	<i>Aster sericeus</i>	Asteraceae				U
Y	<i>Aster shortii</i>	Asteraceae				
Y	<i>Aster simplex</i>	Asteraceae				
Y	<i>Aster umbellatus</i>	Asteraceae				
Y	<i>Astragalus canadensis</i>	Fabaceae				U
Y	<i>Astragalus neglectus</i>	Fabaceae			END	
Y	<i>Athyrium filix-femina</i>	Polypodiaceae				
Y	<i>Aureolaria grandiflora</i>	Scrophulariaceae				U
Y	<i>Baptisia leucantha</i>	Fabaceae				U
Y	<i>Baptisia leucophea</i>	Fabaceae				U
Y	<i>Besseyia bullii</i>	Scrophulariaceae			THR	
Y	<i>Betula alleghaniensis</i>	Betulaceae				
Y	<i>Betula papyrifera</i>	Betulaceae				
Y	<i>Betula pumila</i>	Betulaceae				
Y	<i>Bidens cernua</i>	Asteraceae				
Y	<i>Bidens comosa</i>	Asteraceae				
Y	<i>Bidens coronata</i>	Asteraceae				
Y	<i>Bidens frondosa</i>	Asteraceae				
Y	<i>Bidens vulgata</i>	Asteraceae				
Y	<i>Blephilia ciliata</i>	Lamiaceae				
Y	<i>Blephilia hirsuta</i>	Lamiaceae				
Y	<i>Boehmeria cylindrica</i>	Urticaceae				
Y	<i>Botrychium dissectum</i>	Ophioglossaceae				
Y	<i>Botrychium multifidum</i>	Ophioglossaceae				U
Y	<i>Botrychium virginianum</i>	Ophioglossaceae				
Y	<i>Bouteloua curtipendula</i>	Poaceae				
Y	<i>Brachyelytrum erectum</i>	Poaceae				
Y	<i>Bromus altissimus</i>	Poaceae				
Y	<i>Bromus ciliatus</i>	Poaceae				
Y	<i>Bromus kalmii</i>	Poaceae				U
Y	<i>Bromus pubescens</i>	Poaceae				
Y	<i>Bulbostylis capillaris</i>	Cyperaceae				U
Y	<i>Cacalia atriplicifolia</i>	Asteraceae				U
Y	<i>Cacalia muhlenbergii</i>	Asteraceae			SC	
Y	<i>Cacalia plantaginea</i>	Asteraceae			THR	
Y	<i>Cacalia suaveolens</i>	Asteraceae			SC	
Y	<i>Cakile edentula</i>	Brassicaceae			SC	
Y	<i>Calamagrostis canadensis</i>	Poaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Calamovilfa longifolia</i>	Poaceae			THR	
Y	<i>Calla palustris</i>	Araceae				U
Y	<i>Callitriche palustris</i>	Callitricaceae				U
Y	<i>Calopogon tuberosus</i>	Orchidaceae				U
Y	<i>Caltha palustris</i>	Ranunculaceae				
Y	<i>Campanula americana</i>	Campanulaceae				
Y	<i>Campanula aparinoides</i>	Campanulaceae				
Y	<i>Campanula rotundifolia</i>	Campanulaceae				
Y	<i>Camptosorus rhizophyllus</i>	Polypodiaceae				U
Y	<i>Cardamine bulbosa</i>	Brassicaceae				
Y	<i>Cardamine douglassii</i>	Brassicaceae				
Y	<i>Cardamine pennsylvanica</i>	Brassicaceae				
Y	<i>Cardamine pratensis</i>	Brassicaceae			SC	
Y	<i>Carex albursina</i>	Cyperaceae				
Y	<i>Carex alopecoidea</i>	Cyperaceae				U
Y	<i>Carex aquatilis</i>	Cyperaceae				
Y	<i>Carex atherodes</i>	Cyperaceae				U
Y	<i>Carex aurea</i>	Cyperaceae				U
Y	<i>Carex bebbii</i>	Cyperaceae				
Y	<i>Carex bicknellii</i>	Cyperaceae				
Y	<i>Carex blanda</i>	Cyperaceae				
Y	<i>Carex bromoides</i>	Cyperaceae				U
Y	<i>Carex buxbaumii</i>	Cyperaceae				
Y	<i>Carex cephaloidea</i>	Cyperaceae				
Y	<i>Carex cephalophora</i>	Cyperaceae				
Y	<i>Carex communis</i>	Cyperaceae				U
Y	<i>Carex comosa</i>	Cyperaceae				
Y	<i>Carex cristatella</i>	Cyperaceae				
Y	<i>Carex crus-corvi</i>	Cyperaceae			END	
Y	<i>Carex deweyana</i>	Cyperaceae				U
Y	<i>Carex diandra</i>	Cyperaceae				
Y	<i>Carex digitalis</i>	Cyperaceae				
Y	<i>Carex disperma</i>	Cyperaceae				U
Y	<i>Carex eburnea</i>	Cyperaceae				U
Y	<i>Carex emoryi</i>	Cyperaceae				
Y	<i>Carex formosa</i>	Cyperaceae			THR	
Y	<i>Carex gracilescens</i>	Cyperaceae			SC	
Y	<i>Carex gracillima</i>	Cyperaceae				
Y	<i>Carex granularis</i>	Cyperaceae				
Y	<i>Carex grayi</i>	Cyperaceae				U
Y	<i>Carex grisea</i>	Cyperaceae				
Y	<i>Carex haydenii</i>	Cyperaceae				U
Y	<i>Carex hirtifolia</i>	Cyperaceae				
Y	<i>Carex hystericina</i>	Cyperaceae				
Y	<i>Carex interior</i>	Cyperaceae				
Y	<i>Carex intumescens</i>	Cyperaceae				
Y	<i>Carex lacustris</i>	Cyperaceae				
Y	<i>Carex lasiocarpa</i>	Cyperaceae				
Y	<i>Carex laxiculmis</i>	Cyperaceae				
Y	<i>Carex laxiflora</i>	Cyperaceae				
Y	<i>Carex leptalea</i>	Cyperaceae				
Y	<i>Carex limosa</i>	Cyperaceae				U
Y	<i>Carex lupuliformis</i>	Cyperaceae			END	
Y	<i>Carex lupulina</i>	Cyperaceae				
Y	<i>Carex magellanica</i>	Cyperaceae				
Y	<i>Carex meadii</i>	Cyperaceae				U
Y	<i>Carex molesta</i>	Cyperaceae				
Y	<i>Carex normalis</i>	Cyperaceae				
Y	<i>Carex oligocarpa</i>	Cyperaceae				
Y	<i>Carex oligosperma</i>	Cyperaceae				
Y	<i>Carex pallescens</i>	Cyperaceae			SC	
Y	<i>Carex pedunculata</i>	Cyperaceae				
Y	<i>Carex pellita</i>	Cyperaceae				
Y	<i>Carex pennsylvanica</i>	Cyperaceae				
Y	<i>Carex plantaginea</i>	Cyperaceae				
Y	<i>Carex prairea</i>	Cyperaceae				
Y	<i>Carex projecta</i>	Cyperaceae				
Y	<i>Carex pseudocyperus</i>	Cyperaceae				
Y	<i>Carex radiata</i>	Cyperaceae				
Y	<i>Carex retrorsa</i>	Cyperaceae				
Y	<i>Carex rosea</i>	Cyperaceae				
Y	<i>Carex sartwellii</i>	Cyperaceae				
Y	<i>Carex scoparia</i>	Cyperaceae				
Y	<i>Carex siccata</i>	Cyperaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Carex sparganioides</i>	Cyperaceae				
Y	<i>Carex sprengelii</i>	Cyperaceae				
Y	<i>Carex sterilis</i>	Cyperaceae				
Y	<i>Carex stipata</i>	Cyperaceae				
Y	<i>Carex stricta</i>	Cyperaceae				
Y	<i>Carex tenera</i>	Cyperaceae				
Y	<i>Carex tenuiflora</i>	Cyperaceae			SC	
Y	<i>Carex tetanica</i>	Cyperaceae				
Y	<i>Carex trichocarpa</i>	Cyperaceae				
Y	<i>Carex tuckermanni</i>	Cyperaceae				U
Y	<i>Carex utriculata</i>	Cyperaceae				
Y	<i>Carex vesicaria</i>	Cyperaceae				
Y	<i>Carex viridula</i>	Cyperaceae				
Y	<i>Carex vulpinoidea</i>	Cyperaceae				
Y	<i>Carex woodii</i>	Cyperaceae				
Y	<i>Carpinus caroliniana</i>	Betulaceae				
Y	<i>Carya cordiformis</i>	Juglandaceae				
Y	<i>Carya ovata</i>	Juglandaceae				
Y	<i>Castilleja coccinea</i>	Scrophulariaceae				U
Y	<i>Castilleja sessiliflora</i>	Scrophulariaceae				U
Y	<i>Caulophyllum thalictroides</i>	Berberidaceae				
Y	<i>Ceanothus americanus</i>	Rhamnaceae				
Y	<i>Celastrus scandens</i>	Celastraceae				
Y	<i>Celtis occidentalis</i>	Ulmaceae				
Y	<i>Cenchrus longispinus</i>	Poaceae				
Y	<i>Cephalanthus occidentalis</i>	Rubiaceae				
Y	<i>Cerastium nutans</i>	Caryophyllaceae				
Y	<i>Ceratophyllum demersum</i>	Ceratophyllaceae				
Y	<i>Chamaedaphne calyculata</i>	Ericaceae				
Y	<i>Chamaesyce maculata</i>	Euphorbiaceae				
Y	<i>Chamaesyce nutans</i>	Euphorbiaceae				
Y	<i>Chelone glabra</i>	Scrophulariaceae				
Y	<i>Chenopodium hybridum</i>	Chenopodiaceae				
Y	<i>Chenopodium missouriense</i>	Chenopodiaceae				
Y	<i>Chenopodium strictum</i>	Chenopodiaceae				
Y	<i>Chimaphila umbellata</i>	Pyrolaceae				U
Y	<i>Cicuta bulbifera</i>	Apiaceae				
Y	<i>Cicuta maculata</i>	Apiaceae				
Y	<i>Cinna arundinacea</i>	Poaceae				U
Y	<i>Circaea alpina</i>	Onagraceae				U
Y	<i>Circaea lutetiana</i>	Onagraceae				
Y	<i>Cirsium altissimum</i>	Asteraceae				
Y	<i>Cirsium discolor</i>	Asteraceae				
Y	<i>Cirsium flodmanii</i>	Asteraceae			SC	
Y	<i>Cirsium muticum</i>	Asteraceae				
Y	<i>Claytonia virginica</i>	Portulacaceae				
Y	<i>Clematis virginiana</i>	Ranunculaceae				
Y	<i>Clintonia borealis</i>	Liliaceae				U
Y	<i>Comandra umbellata</i>	Santalaceae				
Y	<i>Conioselinum chinense</i>	Apiaceae			END	
Y	<i>Conopholis americana</i>	Orobanchaceae				U
Y	<i>Convolvulus sepium</i>	Convolvulaceae				
Y	<i>Convolvulus spithameus</i>	Convolvulaceae				U
Y	<i>Conyza canadensis</i>	Asteraceae				
Y	<i>Coptis trifoliata</i>	Ranunculaceae				U
Y	<i>Corallorhiza maculata</i>	Orchidaceae				U
Y	<i>Corallorhiza odontorhiza</i>	Orchidaceae			SC	
Y	<i>Corallorhiza trifida</i>	Orchidaceae				U
Y	<i>Coreopsis lanceolata</i>	Asteraceae			SC	
Y	<i>Coreopsis palmata</i>	Asteraceae				
Y	<i>Corispermum americanum</i>	Chenopodiaceae				U
Y	<i>Cornus alternifolia</i>	Cornaceae				
Y	<i>Cornus amomum</i>	Cornaceae				
Y	<i>Cornus canadensis</i>	Cornaceae				U
Y	<i>Cornus racemosa</i>	Cornaceae				
Y	<i>Cornus rugosa</i>	Cornaceae				U
Y	<i>Cornus stolonifera</i>	Cornaceae				
Y	<i>Corylus americana</i>	Betulaceae				
Y	<i>Corylus cornuta</i>	Betulaceae				U
Y	<i>Crataegus apiomorpha</i>	Rosaceae				
Y	<i>Crataegus beata</i>	Rosaceae				
Y	<i>Crataegus calpodendron</i>	Rosaceae				
Y	<i>Crataegus chrysocarpa</i>	Rosaceae				
Y	<i>Crataegus coccinoides</i>	Rosaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Crataegus corusca</i>	Rosaceae				
Y	<i>Crataegus crus-galli</i>	Rosaceae				
Y	<i>Crataegus dodgei</i>	Rosaceae				
Y	<i>Crataegus flabellata</i>	Rosaceae				
Y	<i>Crataegus fulleriana</i>	Rosaceae				
Y	<i>Crataegus holmesiana</i>	Rosaceae				
Y	<i>Crataegus lucorum</i>	Rosaceae				
Y	<i>Crataegus lumaria</i>	Rosaceae				
Y	<i>Crataegus macracantha</i>	Rosaceae				
Y	<i>Crataegus macrosperma</i>	Rosaceae				
Y	<i>Crataegus mollis</i>	Rosaceae				
Y	<i>Crataegus pedicellata</i>	Rosaceae				
Y	<i>Crataegus pruinosa</i>	Rosaceae				
Y	<i>Crataegus punctata</i>	Rosaceae				
Y	<i>Crataegus schuettei</i>	Rosaceae				
Y	<i>Crataegus submollis</i>	Rosaceae				
Y	<i>Crataegus succulenta</i>	Rosaceae				
Y	<i>Cryptotaenia canadensis</i>	Apiaceae				
Y	<i>Cuscuta cephalanthi</i>	Convolvulaceae				
Y	<i>Cuscuta coryli</i>	Convolvulaceae				
Y	<i>Cuscuta glomerata</i>	Convolvulaceae				
Y	<i>Cuscuta gronovii</i>	Convolvulaceae				
Y	<i>Cuscuta polygonorum</i>	Convolvulaceae				
Y	<i>Cycloloma atriplicifolium</i>	Chenopodiaceae				
Y	<i>Cynoglossum boreale</i>	Boraginaceae				U
Y	<i>Cyperus diandrus</i>	Cyperaceae				
Y	<i>Cyperus engelmannii</i>	Cyperaceae				
Y	<i>Cyperus erythrorhizos</i>	Cyperaceae				
Y	<i>Cyperus esculentus</i>	Cyperaceae				
Y	<i>Cyperus ferruginescens</i>	Cyperaceae				
Y	<i>Cyperus filiculmis</i>	Cyperaceae				
Y	<i>Cyperus rivularis</i>	Cyperaceae				
Y	<i>Cyperus schweinitzii</i>	Cyperaceae				
Y	<i>Cyperus strigosus</i>	Cyperaceae				
Y	<i>Cypripedium acaule</i>	Orchidaceae				U
Y	<i>Cypripedium arietinum</i>	Orchidaceae			THR	
Y	<i>Cypripedium candidum</i>	Orchidaceae			THR	
Y	<i>Cypripedium parviflorum</i>	Orchidaceae			SC	
Y	<i>Cypripedium pubescens</i>	Orchidaceae			SC	
Y	<i>Cypripedium reginae</i>	Orchidaceae			SC	
Y	<i>Cystopteris bulbifera</i>	Polypodiaceae				
Y	<i>Cystopteris fragilis</i>	Polypodiaceae				
Y	<i>Danthonia spicata</i>	Poaceae				
Y	<i>Decodon verticillatus</i>	Lythraceae				
Y	<i>Dentaria diphylla</i>	Brassicaceae				U
Y	<i>Dentaria laciniata</i>	Brassicaceae				
Y	<i>Deparia acrostichoides</i>	Polypodiaceae				
Y	<i>Deschampsia caespitosa</i>	Poaceae			SC	
Y	<i>Desmodium canadense</i>	Fabaceae				
Y	<i>Desmodium cuspidatum</i>	Fabaceae				U
Y	<i>Desmodium glutinosum</i>	Fabaceae				
Y	<i>Desmodium illinoense</i>	Fabaceae				
Y	<i>Desmodium nudiflorum</i>	Fabaceae				U
Y	<i>Dicentra canadensis</i>	Fumariaceae				U
Y	<i>Dicentra cucullaria</i>	Fumariaceae				U
Y	<i>Diervilla lonicera</i>	Caprifoliaceae				U
Y	<i>Dioscorea villosa</i>	Dioscoreaceae				
Y	<i>Dirca palustris</i>	Thymelaeaceae				U
Y	<i>Dodecatheon meadia</i>	Primulaceae				
Y	<i>Drosera rotundifolia</i>	Droseraceae				U
Y	<i>Dryopteris carthusiana</i>	Polypodiaceae				
Y	<i>Dryopteris cristata</i>	Polypodiaceae				
Y	<i>Dryopteris goldiana</i>	Polypodiaceae				U
Y	<i>Dryopteris intermedia</i>	Polypodiaceae				
Y	<i>Dulichium arundinaceum</i>	Cyperaceae				
Y	<i>Echinochloa muricata</i>	Poaceae				
Y	<i>Echinochloa walteri</i>	Poaceae				U
Y	<i>Echinocystis lobata</i>	Cucurbitaceae				
Y	<i>Eleocharis acicularis</i>	Cyperaceae				
Y	<i>Eleocharis erythropoda</i>	Cyperaceae				
Y	<i>Eleocharis obtusa</i>	Cyperaceae				
Y	<i>Eleocharis palustris</i>	Cyperaceae				
Y	<i>Ellisia nyctelea</i>	Hydrophyllaceae				
Y	<i>Elodea canadensis</i>	Hydrocharitaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Elymus canadensis</i>	Poaceae				
Y	<i>Elymus villosus</i>	Poaceae				
Y	<i>Elymus virginicus</i>	Poaceae				
Y	<i>Elytrigia dasystachya</i>	Poaceae			THR	
Y	<i>Epifagus virginiana</i>	Orobanchaceae				
Y	<i>Epilobium angustifolium</i>	Onagraceae				
Y	<i>Epilobium ciliatum</i>	Onagraceae				
Y	<i>Epilobium coloratum</i>	Onagraceae				
Y	<i>Epilobium leptophyllum</i>	Onagraceae				
Y	<i>Epilobium strictum</i>	Onagraceae			SC	
Y	<i>Equisetum arvense</i>	Equisetaceae				
Y	<i>Equisetum fluviatile</i>	Equisetaceae				
Y	<i>Equisetum hyemale</i>	Equisetaceae				
Y	<i>Equisetum laevigatum</i>	Equisetaceae				
Y	<i>Equisetum pratense</i>	Equisetaceae				U
Y	<i>Equisetum scirpoides</i>	Equisetaceae				U
Y	<i>Equisetum variegatum</i>	Equisetaceae			SC	
Y	<i>Eragrostis frankii</i>	Poaceae				
Y	<i>Eragrostis hypnoides</i>	Poaceae				
Y	<i>Eragrostis pectinata</i>	Poaceae				
Y	<i>Eragrostis spectabilis</i>	Poaceae				
Y	<i>Erechtites hieracifolia</i>	Asteraceae				
Y	<i>Erigenia bulbosa</i>	Apiaceae			END	
Y	<i>Erigeron annuus</i>	Asteraceae				
Y	<i>Erigeron philadelphicus</i>	Asteraceae				
Y	<i>Erigeron pulchellus</i>	Asteraceae				U
Y	<i>Erigeron strigosus</i>	Asteraceae				
Y	<i>Eriophorum angustifolium</i>	Cyperaceae				
Y	<i>Eriophorum gracile</i>	Cyperaceae				U
Y	<i>Eriophorum spissum</i>	Cyperaceae				U
Y	<i>Eriophorum viridi-carinatum</i>	Cyperaceae				U
Y	<i>Erythronium albidum</i>	Liliaceae				
Y	<i>Erythronium americanum</i>	Liliaceae				
Y	<i>Euonymus atropurpurea</i>	Celastraceae				
Y	<i>Eupatorium altissimum</i>	Asteraceae				
Y	<i>Eupatorium maculatum</i>	Asteraceae				
Y	<i>Eupatorium perfoliatum</i>	Asteraceae				
Y	<i>Eupatorium purpureum</i>	Asteraceae				
Y	<i>Eupatorium rugosum</i>	Asteraceae				
Y	<i>Euphorbia corollata</i>	Euphorbiaceae				
Y	<i>Euphorbia polygonifolia</i>	Euphorbiaceae			SC	
Y	<i>Fagus grandifolia</i>	Fagaceae				
Y	<i>Festuca obtusa</i>	Poaceae				
Y	<i>Floerkea proserpinacoides</i>	Limnanthaceae				U
Y	<i>Fragaria vesca</i>	Rosaceae				
Y	<i>Fragaria virginiana</i>	Rosaceae				
Y	<i>Fraxinus americana</i>	Oleaceae				
Y	<i>Fraxinus nigra</i>	Oleaceae				
Y	<i>Fraxinus pennsylvanica</i>	Oleaceae				
Y	<i>Galium aparine</i>	Rubiaceae				
Y	<i>Galium asprellum</i>	Rubiaceae				
Y	<i>Galium boreale</i>	Rubiaceae				
Y	<i>Galium brevipes</i>	Rubiaceae				U
Y	<i>Galium circaezans</i>	Rubiaceae				
Y	<i>Galium concinnum</i>	Rubiaceae				
Y	<i>Galium lanceolatum</i>	Rubiaceae				U
Y	<i>Galium obtusum</i>	Rubiaceae				
Y	<i>Galium tinctorium</i>	Rubiaceae				
Y	<i>Galium triflorum</i>	Rubiaceae				
Y	<i>Gaultheria hispidula</i>	Ericaceae				U
Y	<i>Gaultheria procumbens</i>	Ericaceae				U
Y	<i>Gaura biennis</i>	Onagraceae				
Y	<i>Gaylussacia baccata</i>	Ericaceae				
Y	<i>Gentiana alba</i>	Gentianaceae			THR	
Y	<i>Gentiana andrewsii</i>	Gentianaceae				
Y	<i>Gentiana crinita</i>	Gentianaceae				U
Y	<i>Gentiana procera</i>	Gentianaceae			SC	
Y	<i>Gentianella quinquefolia</i>	Gentianaceae				U
Y	<i>Geranium bicknellii</i>	Geraniaceae				U
Y	<i>Geranium maculatum</i>	Geraniaceae				
Y	<i>Geum aleppicum</i>	Rosaceae				
Y	<i>Geum canadense</i>	Rosaceae				
Y	<i>Geum laciniatum</i>	Rosaceae				
Y	<i>Geum rivale</i>	Rosaceae				U

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Geum triflorum</i>	Rosaceae				
Y	<i>Gleditsia triacanthos</i>	Fabaceae				U
Y	<i>Glyceria grandis</i>	Poaceae				
Y	<i>Glyceria septentrionalis</i>	Poaceae				
Y	<i>Glyceria striata</i>	Poaceae				
Y	<i>Glycyrrhiza lepidota</i>	Fabaceae			SC	
Y	<i>Gnaphalium obtusifolium</i>	Asteraceae				
Y	<i>Goodyera pubescens</i>	Orchidaceae				U
Y	<i>Gymnocarpium dryopteris</i>	Polypodiaceae				
Y	<i>Gymnocladus dioica</i>	Fabaceae			SC	
Y	<i>Habenaria viridis</i>	Orchidaceae				U
Y	<i>Hackelia virginiana</i>	Boraginaceae				
Y	<i>Hamamelis virginiana</i>	Hamamelidaceae				
Y	<i>Hedeoma hispida</i>	Lamiaceae				
Y	<i>Hedeoma pulegioides</i>	Lamiaceae				
Y	<i>Helenium autumnale</i>	Asteraceae				
Y	<i>Helianthemum bicknellii</i>	Cistaceae				U
Y	<i>Helianthemum canadense</i>	Cistaceae				U
Y	<i>Helianthus decapetalus</i>	Asteraceae				
Y	<i>Helianthus giganteus</i>	Asteraceae				
Y	<i>Helianthus grosseserratus</i>	Asteraceae				
Y	<i>Helianthus hirsutus</i>	Asteraceae				
Y	<i>Helianthus laetiflorus</i>	Asteraceae				
Y	<i>Helianthus occidentalis</i>	Asteraceae				
Y	<i>Helianthus strumosus</i>	Asteraceae				
Y	<i>Helianthus tuberosus</i>	Asteraceae				
Y	<i>Heliopsis helianthoides</i>	Asteraceae				
Y	<i>Hepatica acutiloba</i>	Ranunculaceae				
Y	<i>Hepatica americana</i>	Ranunculaceae				
Y	<i>Heraclium lanatum</i>	Apiaceae				
Y	<i>Heuchera richardsonii</i>	Saxifragaceae				U
Y	<i>Hieracium canadense</i>	Asteraceae				
Y	<i>Hieracium scabrum</i>	Asteraceae				
Y	<i>Hieracium umbellatum</i>	Asteraceae				
Y	<i>Hierochloa odorata</i>	Poaceae				
Y	<i>Humulus lupulus</i>	Cannabinaceae				
Y	<i>Hydrastis canadensis</i>	Ranunculaceae			SC	
Y	<i>Hydrophyllum virginianum</i>	Hydrophyllaceae				
Y	<i>Hypericum punctatum</i>	Hypericaceae				
Y	<i>Hypericum pyramidatum</i>	Hypericaceae				U
Y	<i>Hypoxis hirsuta</i>	Amaryllidaceae				
Y	<i>Hystrix patula</i>	Poaceae				
Y	<i>Ilex verticillata</i>	Aquifoliaceae				
Y	<i>Impatiens capensis</i>	Balsaminaceae				
Y	<i>Impatiens pallida</i>	Balsaminaceae				
Y	<i>Iris lacustris</i>	Iridaceae			THR	
Y	<i>Iris virginica</i>	Iridaceae				
Y	<i>Isopyrum biternatum</i>	Ranunculaceae				
Y	<i>Jeffersonia diphylla</i>	Berberidaceae			SC	
Y	<i>Juglans cinerea</i>	Juglandaceae			SC	
Y	<i>Juglans nigra</i>	Juglandaceae				
Y	<i>Juncus alpinoarticulatus</i>	Juncaceae				U
Y	<i>Juncus balticus</i>	Juncaceae				
Y	<i>Juncus brachycephalus</i>	Juncaceae				
Y	<i>Juncus brevicaudatus</i>	Juncaceae				
Y	<i>Juncus bufonius</i>	Juncaceae				
Y	<i>Juncus canadensis</i>	Juncaceae				
Y	<i>Juncus dudleyi</i>	Juncaceae				
Y	<i>Juncus effusus</i>	Juncaceae				U
Y	<i>Juncus nodosus</i>	Juncaceae				
Y	<i>Juncus tenuis</i>	Juncaceae				
Y	<i>Juncus torreyi</i>	Juncaceae				
Y	<i>Juniperus communis</i>	Cupressaceae				
Y	<i>Juniperus virginiana</i>	Cupressaceae				
Y	<i>Krigia biflora</i>	Asteraceae				
Y	<i>Kuhnia eupatorioides</i>	Asteraceae				
Y	<i>Lactuca biennis</i>	Asteraceae				
Y	<i>Lactuca canadensis</i>	Asteraceae				
Y	<i>Laportea canadensis</i>	Urticaceae				
Y	<i>Larix laricina</i>	Pinaceae				
Y	<i>Lathyrus japonicus</i>	Fabaceae				U
Y	<i>Lathyrus ochroleucus</i>	Fabaceae				U
Y	<i>Lathyrus palustris</i>	Fabaceae				
Y	<i>Lathyrus venosus</i>	Fabaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Lechea stricta</i>	Cistaceae				U
Y	<i>Leersia oryzoides</i>	Poaceae				
Y	<i>Leersia virginica</i>	Poaceae				
Y	<i>Lemna minor</i>	Lemnaceae				
Y	<i>Lemna trisulca</i>	Lemnaceae				
Y	<i>Lemna turionifera</i>	Lemnaceae				
Y	<i>Lepidium virginicum</i>	Brassicaceae				
Y	<i>Leptoloma cognatum</i>	Poaceae				
Y	<i>Lespedeza capitata</i>	Fabaceae				
Y	<i>Liatris aspera</i>	Asteraceae				
Y	<i>Liatris cylindracea</i>	Asteraceae				U
Y	<i>Liatris ligulistylis</i>	Asteraceae				U
Y	<i>Liatris pycnostachya</i>	Asteraceae				
Y	<i>Liatris spicata</i>	Asteraceae			SC	
Y	<i>Lilium michiganense</i>	Liliaceae				
Y	<i>Lilium philadelphicum</i>	Liliaceae				U
Y	<i>Lindernia dubia</i>	Scrophulariaceae				U
Y	<i>Linnaea borealis</i>	Caprifoliaceae				U
Y	<i>Liparis liliifolia</i>	Orchidaceae				U
Y	<i>Liparis loeselii</i>	Orchidaceae				U
Y	<i>Lithospermum canescens</i>	Boraginaceae				
Y	<i>Lithospermum caroliniense</i>	Boraginaceae				
Y	<i>Lithospermum latifolium</i>	Boraginaceae			SC	
Y	<i>Lobelia cardinalis</i>	Lobeliaceae				
Y	<i>Lobelia inflata</i>	Lobeliaceae				
Y	<i>Lobelia kalmii</i>	Lobeliaceae				
Y	<i>Lobelia siphilitica</i>	Lobeliaceae				
Y	<i>Lobelia spicata</i>	Lobeliaceae				
Y	<i>Lonicera canadensis</i>	Caprifoliaceae				U
Y	<i>Lonicera dioica</i>	Caprifoliaceae				
Y	<i>Lonicera oblongifolia</i>	Caprifoliaceae				U
Y	<i>Lonicera prolifera</i>	Caprifoliaceae				
Y	<i>Lonicera villosa</i>	Caprifoliaceae				U
Y	<i>Ludwigia palustris</i>	Onagraceae				
Y	<i>Ludwigia polycarpa</i>	Onagraceae				
Y	<i>Lupinus perennis</i>	Fabaceae				U
Y	<i>Luzula acuminata</i>	Juncaceae				
Y	<i>Luzula multiflora</i>	Juncaceae				
Y	<i>Lycopodium clavatum</i>	Lycopodiaceae				U
Y	<i>Lycopodium lucidulum</i>	Lycopodiaceae				
Y	<i>Lycopodium tristachyum</i>	Lycopodiaceae				
Y	<i>Lycopus americanus</i>	Lamiaceae				
Y	<i>Lycopus uniflorus</i>	Lamiaceae				
Y	<i>Lycopus virginicus</i>	Lamiaceae				U
Y	<i>Lysimachia ciliata</i>	Primulaceae				
Y	<i>Lysimachia quadriflora</i>	Primulaceae				
Y	<i>Lysimachia quadrifolia</i>	Primulaceae				U
Y	<i>Lysimachia thyrsoiflora</i>	Primulaceae				
Y	<i>Lythrum alatum</i>	Lythraceae				
Y	<i>Maianthemum canadense</i>	Liliaceae				
Y	<i>Malaxis brachypoda</i>	Orchidaceae			SC	
Y	<i>Malaxis unifolia</i>	Orchidaceae				U
Y	<i>Malus coronaria</i>	Rosaceae				
Y	<i>Malus ioensis</i>	Rosaceae				
Y	<i>Matteuccia struthiopteris</i>	Polypodiaceae				
Y	<i>Medeola virginiana</i>	Liliaceae			SC	
Y	<i>Melampyrum lineare</i>	Scrophulariaceae				U
Y	<i>Menispermum canadense</i>	Menispermaceae				
Y	<i>Mentha arvensis</i>	Lamiaceae				
Y	<i>Menyanthes trifoliata</i>	Gentianaceae				U
Y	<i>Mertensia virginica</i>	Boraginaceae				
Y	<i>Milium effusum</i>	Poaceae				U
Y	<i>Mimulus ringens</i>	Scrophulariaceae				
Y	<i>Mitchella repens</i>	Rubiaceae				U
Y	<i>Mitella diphylla</i>	Saxifragaceae				
Y	<i>Mitella nuda</i>	Saxifragaceae				U
Y	<i>Monarda fistulosa</i>	Lamiaceae				
Y	<i>Monarda punctata</i>	Lamiaceae				
Y	<i>Monotropa hypopithys</i>	Pyrolaceae				U
Y	<i>Monotropa uniflora</i>	Pyrolaceae				U
Y	<i>Muhlenbergia frondosa</i>	Poaceae				
Y	<i>Muhlenbergia glomerata</i>	Poaceae				
Y	<i>Muhlenbergia mexicana</i>	Poaceae				
Y	<i>Muhlenbergia schreberi</i>	Poaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Muhlenbergia tenuiflora</i>	Poaceae				U
Y	<i>Myriophyllum heterophyllum</i>	Haloragidaceae				
Y	<i>Najas flexilis</i>	Najadaceae				
Y	<i>Nemopanthus mucronata</i>	Aquifoliaceae				
Y	<i>Nuphar variegata</i>	Nymphaeaceae				
Y	<i>Nymphaea odorata</i>	Nymphaeaceae				
Y	<i>Oenothera biennis</i>	Onagraceae				
Y	<i>Oenothera parviflora</i>	Onagraceae				
Y	<i>Oenothera perennis</i>	Onagraceae				
Y	<i>Oenothera villosa</i>	Onagraceae				
Y	<i>Onoclea sensibilis</i>	Polypodiaceae				
Y	<i>Onosmodium hispidissimum</i>	Boraginaceae			SC	
Y	<i>Orchis spectabilis</i>	Orchidaceae				U
Y	<i>Orobanche uniflora</i>	Orobanchaceae			SC	
Y	<i>Oryzopsis asperifolia</i>	Poaceae				U
Y	<i>Oryzopsis racemosa</i>	Poaceae				U
Y	<i>Osmorhiza claytonii</i>	Apiaceae				
Y	<i>Osmorhiza longistylis</i>	Apiaceae				
Y	<i>Osmunda cinnamomea</i>	Osmundaceae				
Y	<i>Osmunda claytoniana</i>	Osmundaceae				
Y	<i>Osmunda regalis</i>	Osmundaceae				
Y	<i>Ostrya virginiana</i>	Betulaceae				
Y	<i>Oxalis stricta</i>	Oxalidaceae				
Y	<i>Oxypolis rigidior</i>	Apiaceae				
Y	<i>Panax quinquefolius</i>	Araliaceae			SC	
Y	<i>Panax trifolius</i>	Araliaceae				U
Y	<i>Panicum boreale</i>	Poaceae				
Y	<i>Panicum capillare</i>	Poaceae				
Y	<i>Panicum dichotomiflorum</i>	Poaceae				
Y	<i>Panicum flexile</i>	Poaceae				U
Y	<i>Panicum implicatum</i>	Poaceae				
Y	<i>Panicum latifolium</i>	Poaceae				
Y	<i>Panicum leibergii</i>	Poaceae				
Y	<i>Panicum lindheimeri</i>	Poaceae				U
Y	<i>Panicum linearifolium</i>	Poaceae				U
Y	<i>Panicum oligosanthes</i>	Poaceae				
Y	<i>Panicum virgatum</i>	Poaceae				
Y	<i>Parietaria pensylvanica</i>	Urticaceae				
Y	<i>Parnassia glauca</i>	Saxifragaceae				
Y	<i>Parthenium integrifolium</i>	Asteraceae			THR	
Y	<i>Parthenocissus inserta</i>	Vitaceae				
Y	<i>Parthenocissus quinquefolia</i>	Vitaceae				
Y	<i>Pedicularis canadensis</i>	Scrophulariaceae				
Y	<i>Pedicularis lanceolata</i>	Scrophulariaceae				
Y	<i>Pellaea glabella</i>	Polypodiaceae				U
Y	<i>Penstemon hirsutus</i>	Scrophulariaceae			SC	
Y	<i>Penthorum sedoides</i>	Saxifragaceae				
Y	<i>Petalostemum candidum</i>	Fabaceae				U
Y	<i>Phegopteris hexagonoptera</i>	Polypodiaceae			SC	
Y	<i>Phlox divaricata</i>	Polemoniaceae				
Y	<i>Phlox pilosa</i>	Polemoniaceae				
Y	<i>Phragmites australis</i>	Poaceae				
Y	<i>Phryma leptostachya</i>	Phrymaceae				
Y	<i>Physalis heterophylla</i>	Solanaceae				
Y	<i>Physalis longifolia</i>	Solanaceae				
Y	<i>Physalis virginiana</i>	Solanaceae				
Y	<i>Physocarpus opulifolius</i>	Rosaceae				
Y	<i>Physostegia virginiana</i>	Lamiaceae				
Y	<i>Phytolacca americana</i>	Phytolaccaceae				
Y	<i>Pilea pumila</i>	Urticaceae				
Y	<i>Pinus strobus</i>	Pinaceae				U
Y	<i>Plantago cordata</i>	Plantaginaceae			END	
Y	<i>Plantago rugelii</i>	Plantaginaceae				
Y	<i>Platanthera clavellata</i>	Orchidaceae				U
Y	<i>Platanthera dilatata</i>	Orchidaceae			SC	
Y	<i>Platanthera flava</i>	Orchidaceae			THR	
Y	<i>Platanthera hookeri</i>	Orchidaceae			SC	
Y	<i>Platanthera hyperborea</i>	Orchidaceae				U
Y	<i>Platanthera lacera</i>	Orchidaceae				U
Y	<i>Platanthera leucophaea</i>	Orchidaceae			END	
Y	<i>Platanthera orbiculata</i>	Orchidaceae			SC	
Y	<i>Platanthera psychodes</i>	Orchidaceae				U
Y	<i>Platanus occidentalis</i>	Platanaceae			SC	
Y	<i>Poa alsodes</i>	Poaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Poa languida</i>	Poaceae				U
Y	<i>Poa paludigena</i>	Poaceae			THR	
Y	<i>Poa palustris</i>	Poaceae				
Y	<i>Podophyllum peltatum</i>	Berberidaceae				
Y	<i>Pogonia ophioglossoides</i>	Orchidaceae				U
Y	<i>Polanisia graveolens</i>	Capparidaceae				
Y	<i>Polemonium reptans</i>	Polemoniaceae				U
Y	<i>Polygala sanguinea</i>	Polygalaceae				
Y	<i>Polygala senega</i>	Polygalaceae				
Y	<i>Polygala verticillata</i>	Polygalaceae				
Y	<i>Polygonatum biflorum</i>	Liliaceae				
Y	<i>Polygonatum pubescens</i>	Liliaceae				
Y	<i>Polygonum amphibium</i>	Polygonaceae				
Y	<i>Polygonum arifolium</i>	Polygonaceae				
Y	<i>Polygonum buxiforme</i>	Polygonaceae				
Y	<i>Polygonum erectum</i>	Polygonaceae				
Y	<i>Polygonum hydropiperoides</i>	Polygonaceae				
Y	<i>Polygonum lapathifolium</i>	Polygonaceae				
Y	<i>Polygonum pensylvanicum</i>	Polygonaceae				
Y	<i>Polygonum punctatum</i>	Polygonaceae				
Y	<i>Polygonum ramosissimum</i>	Polygonaceae				
Y	<i>Polygonum sagittatum</i>	Polygonaceae				
Y	<i>Polygonum scandens</i>	Polygonaceae				
Y	<i>Polygonum tenue</i>	Polygonaceae				
Y	<i>Polygonum virginianum</i>	Polygonaceae				
Y	<i>Polymnia canadensis</i>	Asteraceae				U
Y	<i>Polytaenia nuttallii</i>	Apiaceae			THR	
Y	<i>Populus balsamifera</i>	Salicaceae				U
Y	<i>Populus deltoides</i>	Salicaceae				
Y	<i>Populus grandidentata</i>	Salicaceae				
Y	<i>Populus tremuloides</i>	Salicaceae				
Y	<i>Potamogeton amplifolius</i>	Potamogetonaceae				
Y	<i>Potamogeton epihydrus</i>	Potamogetonaceae				U
Y	<i>Potamogeton foliosus</i>	Potamogetonaceae				
Y	<i>Potamogeton natans</i>	Potamogetonaceae				
Y	<i>Potamogeton nodosus</i>	Potamogetonaceae				
Y	<i>Potamogeton pectinatus</i>	Potamogetonaceae				
Y	<i>Potamogeton pusillus</i>	Potamogetonaceae				
Y	<i>Potamogeton zosteriformis</i>	Potamogetonaceae				
Y	<i>Potentilla anserina</i>	Rosaceae				
Y	<i>Potentilla arguta</i>	Rosaceae				
Y	<i>Potentilla fruticosa</i>	Rosaceae				
Y	<i>Potentilla norvegica</i>	Rosaceae				
Y	<i>Potentilla palustris</i>	Rosaceae				
Y	<i>Potentilla simplex</i>	Rosaceae				
Y	<i>Prenanthes alba</i>	Asteraceae				
Y	<i>Prosepinaca palustris</i>	Haloragidaceae				
Y	<i>Prunella vulgaris</i>	Lamiaceae				
Y	<i>Prunus americana</i>	Rosaceae				
Y	<i>Prunus nigra</i>	Rosaceae				
Y	<i>Prunus pensylvanica</i>	Rosaceae				
Y	<i>Prunus serotina</i>	Rosaceae				
Y	<i>Prunus virginiana</i>	Rosaceae				
Y	<i>Ptelea trifoliata</i>	Rutaceae			SC	
Y	<i>Pteridium aquilinum</i>	Polypodiaceae				
Y	<i>Pycnanthemum virginianum</i>	Lamiaceae				
Y	<i>Pyrola asarifolia</i>	Pyrolaceae				U
Y	<i>Pyrola elliptica</i>	Pyrolaceae				U
Y	<i>Pyrola secunda</i>	Pyrolaceae				U
Y	<i>Quercus alba</i>	Fagaceae				
Y	<i>Quercus bicolor</i>	Fagaceae				
Y	<i>Quercus ellipsoidalis</i>	Fagaceae				
Y	<i>Quercus macrocarpa</i>	Fagaceae				
Y	<i>Quercus muehlenbergii</i>	Fagaceae			SC	
Y	<i>Quercus rubra</i>	Fagaceae				
Y	<i>Quercus velutina</i>	Fagaceae				
Y	<i>Ranunculus abortivus</i>	Ranunculaceae				
Y	<i>Ranunculus aquatilis</i>	Ranunculaceae				
Y	<i>Ranunculus cymbalaria</i>	Ranunculaceae			END	
Y	<i>Ranunculus fascicularis</i>	Ranunculaceae				
Y	<i>Ranunculus flabellaris</i>	Ranunculaceae				
Y	<i>Ranunculus hispidus</i>	Ranunculaceae				U
Y	<i>Ranunculus pensylvanicus</i>	Ranunculaceae				
Y	<i>Ranunculus recurvatus</i>	Ranunculaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Ranunculus sceleratus</i>	Ranunculaceae				
Y	<i>Ranunculus septentrionalis</i>	Ranunculaceae				
Y	<i>Ratibida pinnata</i>	Asteraceae				
Y	<i>Rhamnus alnifolia</i>	Rhamnaceae				U
Y	<i>Rhus glabra</i>	Anacardiaceae				
Y	<i>Rhus radicans</i>	Anacardiaceae				
Y	<i>Rhus typhina</i>	Anacardiaceae				
Y	<i>Rhus vernix</i>	Anacardiaceae				
Y	<i>Rhynchospora alba</i>	Cyperaceae				U
Y	<i>Rhynchospora capillacea</i>	Cyperaceae				U
Y	<i>Ribes americanum</i>	Saxifragaceae				
Y	<i>Ribes cynosbati</i>	Saxifragaceae				
Y	<i>Ribes hirtellum</i>	Saxifragaceae				U
Y	<i>Ribes lacustre</i>	Saxifragaceae				
Y	<i>Ribes missouriense</i>	Saxifragaceae				
Y	<i>Ribes triste</i>	Saxifragaceae				
Y	<i>Rorippa palustris</i>	Brassicaceae				
Y	<i>Rosa blanda</i>	Rosaceae				
Y	<i>Rosa carolina</i>	Rosaceae				
Y	<i>Rosa palustris</i>	Rosaceae				
Y	<i>Rubus allegheniensis</i>	Rosaceae				
Y	<i>Rubus flagellaris</i>	Rosaceae				
Y	<i>Rubus frondosus</i>	Rosaceae				
Y	<i>Rubus ithacanus</i>	Rosaceae				
Y	<i>Rubus occidentalis</i>	Rosaceae				
Y	<i>Rubus plicatifolius</i>	Rosaceae				
Y	<i>Rubus pubescens</i>	Rosaceae				
Y	<i>Rubus strigosus</i>	Rosaceae				
Y	<i>Rudbeckia hirta</i>	Asteraceae				
Y	<i>Rudbeckia laciniata</i>	Asteraceae				
Y	<i>Rudbeckia triloba</i>	Asteraceae				
Y	<i>Rumex altissimus</i>	Polygonaceae				
Y	<i>Rumex mexicanus</i>	Polygonaceae				
Y	<i>Rumex orbiculatus</i>	Polygonaceae				
Y	<i>Rumex verticillatus</i>	Polygonaceae				
Y	<i>Sagittaria cuneata</i>	Alismataceae				
Y	<i>Sagittaria latifolia</i>	Alismataceae				
Y	<i>Sagittaria rigida</i>	Alismataceae				
Y	<i>Salix amygdaloides</i>	Salicaceae				
Y	<i>Salix bebbiana</i>	Salicaceae				
Y	<i>Salix candida</i>	Salicaceae				U
Y	<i>Salix discolor</i>	Salicaceae				
Y	<i>Salix eriocephala</i>	Salicaceae				
Y	<i>Salix humilis</i>	Salicaceae				U
Y	<i>Salix interior</i>	Salicaceae				
Y	<i>Salix lucida</i>	Salicaceae				
Y	<i>Salix myricoides</i>	Salicaceae				
Y	<i>Salix nigra</i>	Salicaceae				
Y	<i>Salix pedicellaris</i>	Salicaceae				
Y	<i>Salix petiolaris</i>	Salicaceae				
Y	<i>Salix serissima</i>	Salicaceae				U
Y	<i>Sambucus canadensis</i>	Caprifoliaceae				
Y	<i>Sambucus pubens</i>	Caprifoliaceae				U
Y	<i>Samolus parviflorus</i>	Primulaceae				U
Y	<i>Sanguinaria canadensis</i>	Papaveraceae				
Y	<i>Sanicula gregaria</i>	Apiaceae				
Y	<i>Sanicula marilandica</i>	Apiaceae				
Y	<i>Sanicula trifoliata</i>	Apiaceae				
Y	<i>Sarracenia purpurea</i>	Sarraceniaceae				
Y	<i>Saxifraga pensylvanica</i>	Saxifragaceae				U
Y	<i>Schizachne purpurascens</i>	Poaceae				U
Y	<i>Scirpus acutus</i>	Cyperaceae				
Y	<i>Scirpus atrovirens</i>	Cyperaceae				
Y	<i>Scirpus clintonii</i>	Cyperaceae				U
Y	<i>Scirpus cyperinus</i>	Cyperaceae				
Y	<i>Scirpus fluviatilis</i>	Cyperaceae				
Y	<i>Scirpus microcarpus</i>	Cyperaceae				U
Y	<i>Scirpus pendulus</i>	Cyperaceae				
Y	<i>Scirpus pungens</i>	Cyperaceae				
Y	<i>Scirpus validus</i>	Cyperaceae				
Y	<i>Scleria triglomerata</i>	Cyperaceae			SC	
Y	<i>Scrophularia lanceolata</i>	Scrophulariaceae				
Y	<i>Scrophularia marilandica</i>	Scrophulariaceae				
Y	<i>Scutellaria galericulata</i>	Lamiaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Scutellaria lateriflora</i>	Lamiaceae				
Y	<i>Scutellaria leonardii</i>	Lamiaceae				
Y	<i>Scutellaria ovata</i>	Lamiaceae			SC	
Y	<i>Selaginella eclipses</i>	Selaginellaceae				
Y	<i>Selaginella rupestris</i>	Selaginellaceae				
Y	<i>Senecio aureus</i>	Asteraceae				
Y	<i>Senecio pauperculus</i>	Asteraceae				
Y	<i>Shepherdia canadensis</i>	Elaeagnaceae				U
Y	<i>Silene antirrhina</i>	Caryophyllaceae				
Y	<i>Silene stellata</i>	Caryophyllaceae				U
Y	<i>Silphium integrifolium</i>	Asteraceae				
Y	<i>Silphium laciniatum</i>	Asteraceae				U
Y	<i>Silphium perfoliatum</i>	Asteraceae				
Y	<i>Silphium terebinthinaceum</i>	Asteraceae				
Y	<i>Sisyrinchium albidum</i>	Iridaceae				U
Y	<i>Sisyrinchium angustifolium</i>	Iridaceae			SC	
Y	<i>Sisyrinchium campestre</i>	Iridaceae				U
Y	<i>Sisyrinchium strictum</i>	Iridaceae				
Y	<i>Sium suave</i>	Apiaceae				
Y	<i>Smilacina racemosa</i>	Liliaceae				
Y	<i>Smilacina stellata</i>	Liliaceae				
Y	<i>Smilacina trifolia</i>	Liliaceae				U
Y	<i>Smilax ecirrhata</i>	Liliaceae				
Y	<i>Smilax hispida</i>	Liliaceae				
Y	<i>Smilax illinoensis</i>	Liliaceae				
Y	<i>Smilax lasioneura</i>	Liliaceae				
Y	<i>Solanum americanum</i>	Solanaceae				
Y	<i>Solidago altissima</i>	Asteraceae				
Y	<i>Solidago caesia</i>	Asteraceae			END	
Y	<i>Solidago flexicaulis</i>	Asteraceae				
Y	<i>Solidago gigantea</i>	Asteraceae				
Y	<i>Solidago graminifolia</i>	Asteraceae				
Y	<i>Solidago juncea</i>	Asteraceae				
Y	<i>Solidago missouriensis</i>	Asteraceae				
Y	<i>Solidago nemoralis</i>	Asteraceae				
Y	<i>Solidago ohioensis</i>	Asteraceae			SC	
Y	<i>Solidago patula</i>	Asteraceae				
Y	<i>Solidago riddellii</i>	Asteraceae				
Y	<i>Solidago rigida</i>	Asteraceae				
Y	<i>Solidago speciosa</i>	Asteraceae				
Y	<i>Solidago uliginosa</i>	Asteraceae				
Y	<i>Solidago ulmifolia</i>	Asteraceae				
Y	<i>Sorghastrum major</i>	Poaceae				
Y	<i>Sparganium emersum</i>	Sparganiaceae				U
Y	<i>Sparganium eurycarpum</i>	Sparganiaceae				
Y	<i>Spartina pectinata</i>	Poaceae				
Y	<i>Sphenopholis intermedia</i>	Poaceae				
Y	<i>Spiraea alba</i>	Rosaceae				
Y	<i>Spiranthes cernua</i>	Orchidaceae				
Y	<i>Spiranthes lacera</i>	Orchidaceae				U
Y	<i>Spiranthes magnicamporum</i>	Orchidaceae				U
Y	<i>Spiranthes romanzoffiana</i>	Orchidaceae				U
Y	<i>Spirodela polyrrhiza</i>	Lemnaceae				
Y	<i>Sporobolus cryptandrus</i>	Poaceae				
Y	<i>Sporobolus heterolepis</i>	Poaceae				
Y	<i>Sporobolus vaginiflorus</i>	Poaceae				
Y	<i>Stachys palustris</i>	Lamiaceae				
Y	<i>Stachys tenuifolia</i>	Lamiaceae				
Y	<i>Staphylea trifolia</i>	Staphylaceae				U
Y	<i>Stellaria longifolia</i>	Caryophyllaceae				
Y	<i>Stipa spartea</i>	Poaceae				
Y	<i>Streptopus roseus</i>	Liliaceae				U
Y	<i>Symphoricarpos albus</i>	Caprifoliaceae				U
Y	<i>Symphoricarpos occidentalis</i>	Caprifoliaceae				
Y	<i>Symplocarpus foetidus</i>	Araceae				
Y	<i>Taenidia integerrima</i>	Apiaceae				
Y	<i>Taxus canadensis</i>	Taxaceae			SC	
Y	<i>Tephrosia virginiana</i>	Fabaceae				U
Y	<i>Teucrium canadense</i>	Lamiaceae				
Y	<i>Thalictrum dasycarpum</i>	Ranunculaceae				
Y	<i>Thalictrum dioicum</i>	Ranunculaceae				
Y	<i>Thalictrum revolutum</i>	Ranunculaceae			SC	
Y	<i>Thelypteris palustris</i>	Polypodiaceae				
Y	<i>Thuja occidentalis</i>	Cupressaceae				

MILW:	SPECIES:	FAMILY:	Common:	Habitats:	WI Status:	Reg Status:
Y	<i>Tilia americana</i>	Tiliaceae				
Y	<i>Tofieldia glutinosa</i>	Liliaceae			THR	
Y	<i>Tradescantia ohimensis</i>	Commelinaceae				
Y	<i>Triadenum fraseri</i>	Hypericaceae				
Y	<i>Trientalis borealis</i>	Primulaceae				
Y	<i>Triglochin maritima</i>	Juncaginaceae			SC	
Y	<i>Triglochin palustris</i>	Juncaginaceae			SC	
Y	<i>Trillium cernuum</i>	Liliaceae				U
Y	<i>Trillium flexipes</i>	Liliaceae				
Y	<i>Trillium grandiflorum</i>	Liliaceae				
Y	<i>Trillium nivale</i>	Liliaceae			THR	
Y	<i>Trillium recurvatum</i>	Liliaceae			SC	
Y	<i>Triosteum aurantiacum</i>	Caprifoliaceae				
Y	<i>Triosteum perfoliatum</i>	Caprifoliaceae				
Y	<i>Trisetum melicoides</i>	Poaceae			END	
Y	<i>Tsuga canadensis</i>	Pinaceae				U
Y	<i>Typha angustifolia</i>	Typhaceae				
Y	<i>Typha latifolia</i>	Typhaceae				
Y	<i>Ulmus americana</i>	Ulmaceae				
Y	<i>Ulmus rubra</i>	Ulmaceae				
Y	<i>Ulmus thomasii</i>	Ulmaceae				
Y	<i>Urtica dioica</i>	Urticaceae				
Y	<i>Utricularia vulgaris</i>	Lentibulariaceae				
Y	<i>Uvularia grandiflora</i>	Liliaceae				
Y	<i>Vaccinium angustifolium</i>	Ericaceae				
Y	<i>Vaccinium macrocarpon</i>	Ericaceae				
Y	<i>Vaccinium myrtilloides</i>	Ericaceae				U
Y	<i>Vaccinium oxycoccos</i>	Ericaceae				
Y	<i>Valerianella chenopodifolia</i>	Valerianaceae				
Y	<i>Vallisneria americana</i>	Hydrocharitaceae				
Y	<i>Verbena bracteata</i>	Verbenaceae				
Y	<i>Verbena hastata</i>	Verbenaceae				
Y	<i>Verbena simplex</i>	Verbenaceae			SC	
Y	<i>Verbena stricta</i>	Verbenaceae				
Y	<i>Verbena urticifolia</i>	Verbenaceae				
Y	<i>Vernonia fasciculata</i>	Asteraceae				
Y	<i>Veronica anagallis-aquatica</i>	Scrophulariaceae				
Y	<i>Veronica peregrina</i>	Scrophulariaceae				
Y	<i>Veronica scutellata</i>	Scrophulariaceae				
Y	<i>Veronicastrum virginicum</i>	Scrophulariaceae				
Y	<i>Viburnum acerifolium</i>	Caprifoliaceae				
Y	<i>Viburnum lentago</i>	Caprifoliaceae				
Y	<i>Viburnum prunifolium</i>	Caprifoliaceae			SC	
Y	<i>Viburnum rafinesquianum</i>	Caprifoliaceae				
Y	<i>Viburnum trilobum</i>	Caprifoliaceae				
Y	<i>Vicia americana</i>	Fabaceae				
Y	<i>Vicia caroliniana</i>	Fabaceae				
Y	<i>Viola affinis</i>	Violaceae				
Y	<i>Viola blanda</i>	Violaceae				
Y	<i>Viola canadensis</i>	Violaceae				U
Y	<i>Viola cucullata</i>	Violaceae				
Y	<i>Viola labradorica</i>	Violaceae				
Y	<i>Viola pallens</i>	Violaceae				
Y	<i>Viola pedata</i>	Violaceae				
Y	<i>Viola pedatifida</i>	Violaceae				
Y	<i>Viola pubescens</i>	Violaceae				
Y	<i>Viola rostrata</i>	Violaceae			SC	
Y	<i>Viola sagittata</i>	Violaceae				
Y	<i>Viola sororia</i>	Violaceae				
Y	<i>Vitis riparia</i>	Vitaceae				
Y	<i>Vulpia octoflora</i>	Poaceae				U
Y	<i>Wolffia columbiana</i>	Lemnaceae				
Y	<i>Xanthium strumarium</i>	Asteraceae				
Y	<i>Zanthoxylum americanum</i>	Rutaceae				
Y	<i>Zizania aquatica</i>	Poaceae				U
Y	<i>Zizania palustris</i>	Poaceae				
Y	<i>Zizia aptera</i>	Apiaceae				
Y	<i>Zizia aurea</i>	Apiaceae				
Y	<i>Zosterella dubia</i>	Pontederiaceae				

		2006-2008	2006-2008	2009	2010	2011	2012
Menomonee Valley Community Park							
Species planted to date, October 2009							
Nancy M. Aten							
EMERGENT AQUATIC ZONE (forebays holding water below six he		2006-2008	2006-2008	2009	2010	2011	2012
<u>Grasses/Sedges/Rushes</u>							
<i>Eleocharis acicularis</i>	Needle Spikerush	supplemental	plug	96			
<i>Juncus torreyi</i>	Torrey's Rush	supplemental	plug				
<i>Scirpus cyperinus</i>	Woolgrass	supplemental	plug				
<i>Scirpus fluviatilis</i>	River Bulrush	initial	plug				
<i>Scirpus fluviatilis</i>	River Bulrush	supplemental	plug				
<i>Scirpus validus creber</i>	Softstem Bulrush	initial	plug				
<i>Sparganium eurycarpum</i>	Common Burreed	initial	plug				
<u>Forbs</u>							
<i>Acorus calamus</i>	Sweet Flag	initial	plug				
<i>Alisma subcordatum</i>	Water Plantain	initial	plug				
<i>Iris virginica shrevei</i>	Blue Flag Iris	initial	plug				
<i>Pontederia cordata</i>	Pickerel Weed	initial	plug				
<i>Sagittaria latifolia</i>	Arrowhead	initial	plug				
WET MARGINS		2006-2008	2006-2008	2009	2010	2011	2012
<u>Grasses/Sedges/Rushes</u>							
<i>Calamagrostis canadensis</i>	Blue-Joint Grass			192			
<i>Carex aquatilis</i>	Long-Bracted Tussock Sedge	supplemental	plug				
<i>Glyceria striata</i>	Fowl Manna Grass			64			
<i>Juncus dudleyi</i>	Dudley's Rush	supplemental	plug	192			
<i>Juncus effusus</i>	Soft Rush	supplemental	plug				
<i>Spartina pectinata</i>	Prairie Cordgrass	supplemental	plug				
<u>Shrubs</u>							
<i>Cornus amomum</i>	Silky Dogwood	initial & supplemental					
<i>Cornus sericea</i>	Redosier Dogwood	initial & supplemental		15			
<i>Ilex verticillata</i>	Winterberry	initial					
<i>Physocarpus opulifolius</i>	Ninebark	initial & supplemental					
<i>Spiraea alba</i>	Meadowsweet	initial & supplemental					
PART SHADE INFILTRATION SWALES		2006-2008	2006-2008	2009	2010	2011	2012
<u>Grasses/Sedges/Rushes</u>							
<i>Carex stipata</i>	Common Fox Sedge	supplemental	plug				
<i>Carex vulpinoidea</i>	Brown Fox Sedge	supplemental	plug	192			
<i>Elymus villosus</i>	Silky Wild Rye	supplemental	plug				
<i>Elymus virginicus</i>	Virginia Wild Rye	supplemental	plug				
<i>Juncus dudleyi</i>	Dudley's Rush	supplemental	plug				
<i>Juncus tenuis</i>	Path Rush	supplemental	plug	64			
<i>Juncus torreyi</i>	Torrey's Rush	supplemental	plug				
<u>Forbs</u>							
<i>Geranium maculatum</i> (to be supplemented)		supplemental	plug				
NARROW STREET INFILTRATION SWALES		2006-2008	2006-2008	2009	2010	2011	2012
<u>Grasses/Sedges/Rushes</u>							
<i>Juncus balticus</i>	Baltic Rush	supplemental	plug	128			
<i>Juncus dudleyi</i>	Dudley's Rush	supplemental	plug				
<i>Juncus tenuis</i>	Path Rush	supplemental	plug	128			
MESIC PRAIRIE		2006-2008	2006-2008	2009	2010	2011	
<u>Cover</u> (50 lb/acre = 800 oz/acre)							
<i>Multi-cover</i>	Flax, Buckwheat, Annual Rye & Oats						
<u>Grasses/Sedges/Rushes</u> (5-8 lb/acre = 80-128 oz/acre)							
<i>Andropogon gerardii</i>	Big Bluestem	initial & supplemental	seed & plug	128			

		2006-2008	2006-2008	2009	2010	2011	2012
<i>Bromus ciliatus</i>	Fringed Brome	initial	seed				
<i>Calamagrostis canadensis</i>	Bluejoint Grass	initial & supplemental	seed & plug				
<i>Carex bebbii</i>	Bebb's Sedge	supplemental	plug				
<i>Elymus villosus</i>	Silky Wild Rye	supplemental	plug				
<i>Elymus virginicus</i>	Virginia Wild Rye	initial & supplemental	seed & plug				
<i>Juncus dudleyii</i>	Dudley's Rush	supplemental	plug				
<i>Juncus torreyi</i>	Torrey's Rush	supplemental	plug				
<i>Panicum virgatum</i>	Switchgrass	initial & supplemental	seed & plug	128			
<i>Sorghastrum nutans</i>	Indian Grass			64			
<i>Spartina pectinata</i>	Prairie Cordgrass	initial & supplemental	seed & plug	64			
Forbs (8-12 lb/acre = 128-192 oz/acre)							
<i>Angelica atropurpurea</i>	Angelica	initial	seed				
<i>Asclepias incarnata</i>	Swamp Milkweed	initial & supplemental	seed & plug				
<i>Aster laevis</i>	Smooth Blue Aster	initial & supplemental	seed & plug				
<i>Aster novae-angliae</i>	New England Aster	initial & supplemental	seed & plug				
<i>Aster puniceus</i>	Swamp Aster	initial	seed				
<i>Aster simplex</i>	Panicled Aster	initial	seed				
<i>Aster umbellatus</i>	Flat-top Aster	initial	seed				
<i>Chelone glabra</i>	Turtlehead	initial	seed				
<i>Desmodium canadense</i>	Canada Tick Trefoil	initial & supplemental	seed & plug	32			
<i>Eupatorium maculatum</i>	Spotted Joeeyeweed	initial	seed				
<i>Eupatorium perfoliatum</i>	Boneset	initial & supplemental	seed & plug	32			
<i>Gentiana andrewsii</i>	Bottle Gentian	initial	seed				
<i>Helenium autumnale</i>	Sneezeweed	initial & supplemental	seed & plug	32			
<i>Helianthus grosseratus</i>	Sawtooth Sunflower			32			
<i>Iris virginica-shrevei</i>	Wild Blueflag Iris	initial	seed				
<i>Liatris pycnostachya</i>	Prairie Blazingstar	initial	seed	32			
<i>Liatris spicata</i>	Marsh Blazingstar	initial & supplemental	seed & plug				
<i>Lobelia siphilitica</i>	Great Blue Lobelia	initial	seed				
<i>Lycopus americanus</i>	Common Water Horehound	initial	seed				
<i>Mimulus ringens</i>	Monkey Flower	initial	seed				
<i>Monarda fistulosa</i>	Wild Bergamot	initial	seed				
<i>Physostegia virginiana</i>	False Dragonhead	initial & supplemental	seed & plug	32			
<i>Pycnanthemum virginianum</i>	Mountain Mint	initial & supplemental	seed & plug	32			
<i>Ratibida pinnata</i>	Yellow Coneflower	initial	seed				
<i>Rudbeckia hirta</i>	Black-eyed Susan	initial	seed				
<i>Rudbeckia subtomentosa</i>	Sweet Blackeyed Susan	initial	seed				
<i>Silphium perfoliatum</i>	Cupplant	initial	seed				
<i>Solidago graminifolia</i>	Grass-leaved Goldenrod	initial & supplemental	seed & plug				
<i>Solidago riddellii</i>	Riddell's Goldenrod	initial & supplemental	seed & plug				
<i>Teucrium canadense</i>	Germander			64			
<i>Thalictrum dasycarpum</i>	Meadow Rue	initial	seed				
<i>Tradescantia ohioensis</i>	Spiderwort	initial & supplemental	seed & plug	32			
<i>Verbena hastata</i>	Blue Vervain	initial & supplemental	seed & plug	32			
<i>Vernonia fasciculata</i>	Ironweed	initial & supplemental	seed & plug	32			
<i>Zizia aurea</i>	Golden Alexander	initial & supplemental	seed & plug	32			
DRY / MESIC PRAIRIE and SAVANNA							
		2006-2008	2006-2008	2009	2010	2011	2012
Cover (50 lb/acre = 800 oz/acre)							
<i>Multi-cover</i>	Flax, Buckwheat, Ann Rye & Oats						
Grasses/Sedges/Rushes (5-8 lb/acre = 80-128 oz/acre)							
<i>Andropogon gerardii</i>	Big Bluestem	initial & supplemental	seed & plug				
<i>Bouteloua curtipendula</i>	Sideoats Gramma	supplemental	plug				
<i>Carex bicknellii</i>	Bicknell's Sedge	supplemental	plug	192			
<i>Elymus canadensis</i>	Canada Wild Rye	initial & supplemental	seed & plug				
<i>Juncus tenuis</i>	Path Rush			64			
<i>Koeleria macrantha</i>	June Grass	supplemental	plug	128			
<i>Muhlenbergia racemosa +</i>	Wild Timothy	initial	seed				
<i>Panicum virgatum</i>	Switchgrass	initial & supplemental	seed & plug	64			
<i>Schizachyrium scoparium</i>	Little Bluestem	initial & supplemental	seed & plug	128			
<i>Sorghastrum nutans</i>	Indian Grass	initial & supplemental	seed & plug	128			
<i>Sporobolus heterolepis</i>	Prairie Dropseed	initial & supplemental	seed & plug				
Forbs (8-12 lb/acre = 128-192 oz/acre)							
<i>Agastache scrophulariaefolia</i>	Purple Giant Hyssop	initial & supplemental	seed & plug	32			
<i>Allium cernuum</i>	Nodding Wild Onion	supplemental	plug	64			
<i>Asclepias syriaca</i>	Common Milkweed			96			
<i>Anemone cylindrica</i>	Thimbleweed	initial & supplemental	seed & plug				
<i>Aquilegia canadensis</i>	Columbine	initial & supplemental	seed & plug				
<i>Aster azureus</i>	Sky Blue Aster	initial & supplemental	seed & plug	32			

		2006-2008	2006-2008	2009	2010	2011	2012
<i>Aster laevis</i>	Smooth Aster	initial & supplemental	seed & plug				
<i>Aster novae-angliae</i>	New England Aster	initial & supplemental	seed & plug				
<i>Aster sericeus</i>	Silky Aster			32			
<i>Cassia fasciculata</i>	Partridge Pea	initial	seed				
<i>Coreopsis lanceolata</i>	Lance-leaved Coreopsis	initial	seed				
<i>Coreopsis palmata</i>	Prairie Coreopsis	initial	seed				
<i>Desmodium canadense</i>	Canada Tick Trefoil	initial & supplemental	seed & plug				
<i>Desmodium illinoense</i>	Illinois Tick Trefoil			32			
<i>Echinacea pallida</i>	Pale Purple Coneflower	initial	seed				
<i>Eryngium yuccifolium</i>	Rattlesnake Master	initial	seed				
<i>Euphorbia corollata</i>	Flowering Spurge			32			
<i>Gaura biennis</i>	Biennial Gaura	initial	seed				
<i>Helianthus occidentalis</i>	Western Sunflower			64			
<i>Heliopsis helianthoides</i>	Oxeye Sunflower	supplemental	plug				
<i>Lespedeza capitata</i>	Prairie Bush Clover	supplemental	plug	32			
<i>Liatris aspera</i>	Rough Blazingstar			32			
<i>Monarda fistulosa</i>	Wild Bergamot	initial	seed				
<i>Monarda punctata</i>	Dotted Mint			32			
<i>Oenothera biennis</i>	Evening Primrose	initial	seed				
<i>Parthenium integrifolium</i>	Wild Quinine	initial & supplemental	seed & plug				
<i>Penstemon digitalis</i>	Penstemon	initial	seed				
<i>Petalostemum candidum</i>	White Prairie Clover			96			
<i>Petalostemum purpureum</i>	Purple Prairie Clover	initial & supplemental	seed & plug				
<i>Potentilla arguta</i>	Prairie Cinquefoil	initial & supplemental	seed & plug	32			
<i>Ratibida pinnata</i>	Yellow Coneflower	initial	seed				
<i>Rudbeckia hirta</i>	Black-eyed Susan	initial	seed				
<i>Rudbeckia subtomentosa</i>	Sweet Blackeyed Susan	initial	seed				
<i>Rudbeckia triloba</i>	Branched Coneflower	supplemental	plug	64			
<i>Scrophularia lanceolata</i>	Early Figwort	initial	seed				
<i>Silphium integrifolium</i>	Rosinweed	initial & supplemental	seed & plug	32			
<i>Silphium laciniatum</i>	Compass Plant	initial	seed				
<i>Silphium terebinthinaceum</i>	Prairie Dock	initial	seed				
<i>Solidago nemoralis</i>	Oldfield Goldenrod			32			
<i>Solidago rigida</i>	Stiff Goldenrod	initial & supplemental	seed & plug	96			
<i>Solidago speciosa</i>	Showy Goldenrod			32			
<i>Verbena stricta</i>	Hoary Vervain	initial & supplemental	seed & plug	32			
<i>Verbena urticifolia</i>	Nettle-leaved Vervain	initial	seed				
<i>Zizia aurea</i>	Golden Alexander	initial & supplemental	seed & plug				
Trees							
<i>Acer saccharum</i>	Sugar Maple	initial					
<i>Amelanchier laevis</i>	Serviceberry	initial & supplemental					
<i>Carya cordiformis</i>	Bitternut Hickory	supplemental					
<i>Carya ovata</i>	Shagbark Hickory			1			
<i>Gleditsia triacanthos</i>	Honey Locust	supplemental					
<i>Gymnocladus dioica</i>	Kentucky Coffee Tree	initial					
<i>Ostrya virginiana</i>	Ironwood	initial & supplemental					
<i>Prunus serotina</i>	Black Cherry	supplemental		5			
<i>Ptelea trifoliata</i>	Common Hoptree	supplemental					
<i>Quercus alba</i>	White Oak	initial & supplemental					
<i>Quercus bicolor</i>	Swamp White Oak	initial & supplemental					
<i>Quercus macrocarpa</i>	Bur Oak	initial & supplemental					
<i>Tilia americana</i>	Basswood	initial & supplemental					
Shrubs							
<i>Ceanothus americanus</i>	New Jersey Tea			6			
<i>Celastrus scandens</i>	American Bittersweet			10			
<i>Cornus racemosa</i>	Gray Dogwood	supplemental					
<i>Diervilla lonicera</i>	Bush Honeysuckle	supplemental					
<i>Rhus aromatica</i>	Fragrant Sumac	supplemental		20			
SWAMP FOREST and SLOPES		2006-2008	2006-2008	2009	2010	2011	2012
seeded with mesic prairie mix as transitional							
Cover (50 lb/acre = 800 oz/acre)							
Multi-cover	Flax, Buckwheat, Annual Rye &	Heavier on oats in wet areas					
Grasses/Sedges/Rushes							
includes supplemental plugs from mesic prairie not listed here again							
Forbs/Ferns							

		2006-2008	2006-2008	2009	2010	2011	2012
includes supplemental plugs from mesic prairie not listed again here							
<i>Eupatorium purpureum</i>	Sweet Joe Pye Weed			32			
<i>Frageria virginiana</i>	Wild Strawberry	supplemental	plug				
<i>Geranium maculatum</i>	Wild Geranium	supplemental	plug	128			
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf	supplemental	plug				
<i>Impatiens capensis</i>	Jewelweed	supplemental	seed				
<i>Osmunda cinnamomea</i>	Cinnamon Fern	supplemental	plant				
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	supplemental	plug				
Trees (north-facing slope primarily)							
<i>Acer negundo</i>	Ash-leaved Maple	supplemental					
<i>Acer saccharum</i>	Sugar Maple	initial					
<i>Betula alleghaniensis</i>	Yellow Birch	initial					
<i>Betula papyrifera</i>	Paper Birch	initial					
<i>Carpinus caroliniana</i>	Musclewood	supplemental					
<i>Cornus alternifolia</i>	Pagoda Dogwood	supplemental					
<i>Fraxinus pennsylvanica</i>	Green Ash	supplemental					
<i>Ostrya virginiana</i>	American Hophornbeam	supplemental					
<i>Quercus bicolor</i>	Swamp White Oak	initial					
<i>Quercus rubra</i>	Red Oak	initial					
<i>Salix nigra</i>	Black Willow	initial					
<i>Thuja occidentalis</i>	American White Cedar	supplemental		5			
<i>Ulmus americana</i>	American Elm	supplemental					
<i>Ulmus rubra</i>	Slippery Elm	supplemental					
Shrubs							
<i>Amelanchier stolonifera</i>	Amelanchier	supplemental					
<i>Cornus amomum</i>	Silky Dogwood	initial					
<i>Cornus stolonifera</i>	Red-twig Dogwood	initial					
<i>Physocarpus opulifolius</i>	Ninebark	initial & supplemental		5			
<i>Sambucus canadensis</i>	Elderberry	supplemental					
<i>Symphoricarpos albus</i>	Snowberry	supplemental					
<i>Viburnum prunifolium</i>	Blackhaw	supplemental					
<i>Viburnum rafinesquianum</i>	Downy Arrow-wood	supplemental		6			
<i>Viburnum trilobum</i>	Highbush Cranberry	initial & supplemental		5			
BOREAL REFUGE (north-facing cove)		2006-2008	2006-2008	2009	2010	2011	2012
Trees/Shrubs							
<i>Larix laricina</i>	Tamarack	initial & supplemental					
<i>Picea glauca</i>	White Spruce	initial					
<i>Picea mariana</i>	Black Spruce	initial					
<i>Populus grandidentata</i>	Large-toothed Aspen	supplemental					
<i>Vaccinium myrtilloides</i>	Canada Blueberry	supplemental					
Forbs							
<i>Asarum canadense</i>	Wild Ginger	supplemental					
LOWER RIVERBANK		2006-2008	2006-2008	2009	2010	2011	2012
seeded with mesic prairie mix as transitional							
Trees/Shrubs including live staking							
<i>Acer saccharinum</i>	Silver Maple	supplemental					
<i>Carpinus caroliniana</i>	Musclewood	supplemental					
<i>Cornus stolonifera</i>	Red-twig Dogwood	initial & supplemental					
<i>Euonymus atropurpureus</i>	Wahoo			20			
<i>Physocarpus opulifolius</i>	Ninebark	initial & supplemental					
<i>Salix interior</i>	Sandbar Willow	initial & supplemental					
<i>Salix nigra</i>	Black Willow	initial & supplemental					
<i>Sambucus canadensis</i>	Elderberry			8			
UPPER RIVERBANK		2006-2008	2006-2008	2009	2010	2011	2012
seeded with mesic prairie mix as transitional							
Tree/Shrubs							
<i>Acer rubrum</i>	Red Maple	initial					
<i>Acer saccharum</i>	Sugar Maple	initial					
<i>Aronia melanocarpa</i>	Black Chokeberry	supplemental					

		2006-2008	2006-2008	2009	2010	2011	2012
	<i>Celtis occidentalis</i>	Hackberry	<i>initial</i>				
	<i>Physocarpus opulifolius</i>	Ninebark	<i>supplemental</i>				
	<i>Prunus serotina</i>	Black Cherry	<i>supplmental</i>				
	<i>Quercus alba</i>	White Oak	<i>initial & supplemental</i>				
	<i>Quercus bicolor</i>	Swamp White Oak	<i>initial & supplemental</i>				
	<i>Tilia americana</i>	Basswood	<i>initial</i>				
RIDGES OR EXPOSED AREAS		2006-2008	2006-2008	2009	2010	2011	2012
	<u>Shrubs</u>						
	<i>Cornus racemosa</i>	Gray Dogwood	<i>supplemental</i>	20			
	<i>Corylus americana</i>	Hazelnut	<i>initial</i>				
	<i>Diervilla lonicera</i>	Bush Honeysuckle	<i>supplemental</i>				
	<i>Juniperus communus</i>	Common Juniper	<i>supplemental</i>				
	<i>Rhus glabra</i>	Smooth Sumac	<i>initial</i>				
	<i>Rhus typhina</i>	Staghorn Sumac	<i>initial</i>				
	<u>Trees</u>						
	<i>Crataegus crus-galli</i>	Hawthorn	<i>initial</i>				
	<i>Malus ioensis</i>	Prairie Crab	<i>supplemental</i>	8			
	<i>Populus tremuloides</i>	Quaking Aspen	<i>initial</i>	10			
	<i>Prunus americana</i>	American Plum	<i>supplemental</i>	8			
	<i>Prunus serotina</i>	Black Cherry	<i>supplemental</i>	5			

Latin Name	Common Name	Notes
Hawthorn Glen	SEWRPC 1999 amended by Anne Duffy	
Anne Duffy	Hawthorn Glen, Milwaukee County, WI	
transcribed by djc	Mesic forest, floodplain forest	
Latin Name	Common Name	Notes
<i>Acer negundo</i>	Boxelder	
<i>Acer saccharum</i>	Sugar maple	
<i>Actaea pachypoda</i>	White baneberry	
<i>Allium canadense</i>	Wild onion	
<i>Allium tricoccum</i>	Wild leek	
<i>Anemone quinquefolia</i>	Wood anemone	
<i>Aquilegia canadensis</i>	Columbine	
<i>Arabis laevigata</i>	Smooth rockcress	
<i>Arenaria lateriflora</i>	Wood sandwort	
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	
<i>Asarum canadense</i>	Wild ginger	
<i>Aster macrophyllus</i>	Largeleaf aster	
<i>Aster sagittifolius</i>	Arrowleaf aster	
<i>Caltha palustris</i>	Marsh marigold	
<i>Carex blanda</i>	Wood sedge	
<i>Carex pensylvanica</i>	Penn sedge	
<i>Carya ovata</i>	Shagbark Hickory	
<i>Celastrus scandens</i>	Bittersweet	
<i>Celtis occidentalis</i>	Hackberry	
<i>Circaea lutetiana</i>	Enchanter's-nightshade	
<i>Claytonia virginica</i>	Spring Beauty	
<i>Cornus racemosa</i>	Gray dogwood	
<i>Crataegus apiomorpha</i>	Fort Sheridan hawthorn	
<i>Crataegus calpodendron</i>	Pear hawthorn	
<i>Crataegus macrosperma</i>	Large-seeded hawthorn	
<i>Crataegus mollis</i>	Downy hawthorn	
<i>Crataegus pruinosa</i>	Frosted hawthorn	
<i>Crataegus punctata</i>	Dotted hawthorn	
<i>Crataegus schuettei</i>	Schuette's hawthorn	
<i>Crataegus succulenta</i>	Fleshy hawthorn	
<i>Dodecatheon meadia</i>	Shooting star	
<i>Erythronium albidum</i>	White trout-lily	
<i>Erythronium americanum</i>	Yellow Trout lily	
<i>Eupatorium rugosum</i>	White snakeroot	
<i>Filipendula rubra</i>	Queen of the Prairie	
<i>Fraxinus americana</i>	White ash	
<i>Fraxinus pennsylvanica</i>	Green ash	
<i>Galium aparine</i>	Cleavers	
<i>Geranium maculatum</i>	Geranium	
<i>Geum canadense</i>	White avens	
<i>Hackelia virginiana</i>	Stickseed	
<i>Helianthus decapetalus</i>	Woodland sunflower	
<i>Heracleum lanatum</i>	Cow parsnip	
<i>Hydrophyllum virginianum</i>	Virginia waterleaf	
<i>Impatiens capensis</i>	Jewelweed	
<i>Lithospermum latifolium</i>	American gromwell	Rare
<i>Lonicera prolifera</i>	Yellow honeysuckle	
<i>Maianthemum canadense</i>	Canada Mayflower	
<i>Mertensia virginica</i>	Virginia bluebell	
<i>Monarda fistulosa</i>	Bergamot	
<i>Osmorhiza longistylis</i>	Sweet cicely	
<i>Oxalis stricta</i>	Wood sorrel	
<i>Parthenocissus quinquefolia</i>	Virginia creeper	
<i>Podophyllum peltatum</i>	Mayapple	
<i>Polygonatum biflorum</i>	Solomon's seal	
<i>Populus deltoides</i>	Cottonwood	
<i>Prenanthes alba</i>	White lettuce	
<i>Prenanthes alba</i>	Lion's Foot	
<i>Prunus americana</i>	American Plum	
<i>Prunus serotina</i>	Black cherry	
<i>Prunus virginiana</i>	Chokecherry	
<i>Quercus alba</i>	White oak	

Latin Name	Common Name	Notes
<i>Quercus rubra</i>	Red oak	
<i>Ranunculus septentrionalis</i>	Swamp buttercup	
<i>Rhus radicans</i>	Poison ivy	
<i>Ribes americanum</i>	Black currant	
<i>Ribes missouriense</i>	Missouri gooseberry	
<i>Ribes odoratum</i>	Buffalo Currant	
<i>Rosa blanda</i>	Rose	
<i>Salix nigra</i>	Black willow	
<i>Sanguinaria canadensis</i>	Bloodroot	
<i>Scrophularia marilandica</i>	Late figwort	
<i>Silphium perfoliatum</i>	Cupplant	
<i>Smilacina racemosa</i>	False Solomon's seal	
<i>Smilacina stellata</i>	Starry false Solomon's seal	
<i>Smilax ecirrhata</i>	Carrion flower	
<i>Smilax lasioneura</i>	Carrion flower	
<i>Solidago flexicaulis</i>	Zigzag goldenrod	
<i>Symphoricarpos albus</i>	Snowberry	Unusual
<i>Symplocarpus foetidus</i>	Skunk cabbage	
<i>Taenidia integerrima</i>	Yellow pimpernel	
<i>Thalictrum dasycarpum</i>	Swamp meadow rue	
<i>Tilia americana</i>	Basswood	
<i>Trillium flexipes</i>	Nodding Trillium	
<i>Trillium grandiflorum</i>	Large Flowered Trillium	
<i>Ulmus americana</i>	American elm	
<i>Viburnum lentago</i>	Nannyberry	
<i>Viburnum rafinesquianum</i>	Arrowwood	
<i>Viola sororia</i>	Blue violet	
<i>Vitis riparia</i>	Grape	
<i>Zizia aurea</i>	Golden Alexanders	

Latin Name	Common Name	Notes (nma for key)			Habitat	C
Seminary Woods	Milwaukee County, WI (R. 22E. T. 6 N., Section 15, the NE. 1/4 of the SE. 1/4)					
Richard Barloga	11.46 ha. 37 acres					
transcribed by djc	Mesic forest					
	September 8, 2002, May 10, 2003, May 29 2003, April 29,2004.					
Latin Name	Common Name	Notes (nma for key)			Habitat	C
<i>Acer negundo</i>	Boxelder	2	7		8 SW	0
<i>Acer nigrum</i>	Black Maple				* **	5
<i>Acer rubrum</i>	Red Maple	2			12 NDM	7
<i>Acer saccharum</i>	Sugar Maple	3			9 SM	3
<i>Actaea sp.</i>	Baneberry	2	25		* **	7
<i>Agrimonia gryposepala</i>	Agrimony	2			9 SD	2
<i>Allium canadense</i>	Wild Garlic	7			9 PWM	2
<i>Allium tricoccum</i>	Wild Leek				8 SM	7
<i>Amelanchier laevis</i>	Juneberry	2	20		* **	8
<i>Anemone quinquefolia</i>	Wood Anemone	7			18 NDM	7
<i>Apocynum androsaemifolium</i>	Dogbane	5			18 ND	5
<i>Arisaema triphyllum</i>	Jack in the Pulpit				13 SDM	5
<i>Asarum canadense</i>	Wild Ginger	2	21		8 CLS	7
<i>Aster lateriflorus</i>	Side Flowering Aster	2			11 SW	4
<i>Aster macrophyllus</i>	Largeleaf Aster	5			14 BF	10
<i>Athyrium filix-femina</i>	Lady Fern	2	7		14 SDM	8
<i>Betula papyrifera</i>	White Birch	2	7	8	15 NDM	10
<i>Caltha palustris</i>	Marsh Marigold	2	23		13 FN	5
<i>Cardamine douglassii</i>	Purple Spring Cress	19			2 SM	7
<i>Carex (rosea)</i>	Curly-styled Wood Sedge				2 SWM	4
<i>Carex albursina</i>	Blunt-scaled Wood Sedge	5			8 SM	7
<i>Carex grisea</i>	Wood Gray Sedge				1 SWM	2
<i>Carex hirtifolia</i>	Hairy Wood Sedge	16			2 SM	5
<i>Carex pensylvanica</i>	Penn Sedge	5			16 SDM	5
<i>Carex sparganioides</i>	Loose-headed Bracted Sedge				1 SWM	3
<i>Carpinus caroliniana</i>	Musclewood				3 BF	8
<i>Carya cordiformis</i>	Yellowbud Hickory	2	5		8 SM	7
<i>Carya ovata</i>	Shagbark Hickory	2			12 OO	5
<i>Caulophyllum thalictroides</i>	Blue Cohosh	2	7		10 SM	8
<i>Circaea lutetiana</i>	Enchanter's Nightshade				13 SDM	1
<i>Claytonia virginica</i>	Spring Beauty	2	24		6 SM	2
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	2	7		13 SDM	9
<i>Cornus racemosa</i>	Gray Dogwood	2			21 SD	1
<i>Cornus stolonifera</i>	Red Dogwood	2			12 SC	6
<i>Crataegus succulenta</i>	Fleshy Hawthorn	5			* **	5
<i>Dentaria laciniata</i>	Toothwort	7			6 SM	5
<i>Dodecatheon meadia</i>	Shooting Star	2	9		14 PWM	6
<i>Epifagus virginiana</i>	Beech-drops	7			3 NM	10
<i>Erythronium albidum</i>	White Trout Lily	3	7		7 SM	5
<i>Erythronium americanum</i>	Yellow Trout Lily	4	5	7	3 NM	8
<i>Fagus grandifolia</i>	Beech				6 NM	10
<i>Fraxinus americana</i>	White Ash				12 SDM	5
<i>Fraxinus nigra</i>	Black Ash	2	7		13 NWM	10
<i>Fraxinus pennsylvanica subintegerrima</i>	Green Ash				9 SWM	2
<i>Geranium maculatum</i>	Geranium				21 SDM	4
<i>Geum canadense</i>	White Avens				13 SDM	0
<i>Glyceria striata</i>	Fowl Manna Grass	2			13 FN	4
<i>Hamamelis virginiana</i>	Witch Hazel				8 NDM	8
<i>Heracleum lanatum</i>	Cow Parsnip	7			4 SDM	5
<i>Hydrophyllum virginianum</i>	Waterleaf				10 SM	5
<i>Hystrix patula</i>	Bottlebrush Grass	2			9 SDM	5
<i>Impatiens (capensis)</i>	Orange Jewelweed	7			18 NWM	3
<i>Juglans cinerea</i>	Butternut				7 SM	8
<i>Juglans nigra</i>	Black Walnut	2	10		5 SDM	5
<i>Laportea canadensis</i>	Wood Nettle	7			13 SW	3
<i>Lilium michiganense</i>	Turk's Cap Lily	2	28		19 PW	6
<i>Mainthemum canadense</i>	Canada Mayflower	5	7	9	18 BF	10
<i>Menispermum canadense</i>	Moonseed	2			11 SW	6
<i>Ostrya virginiana</i>	Ironwood				10 SM	5
<i>Parthenocissus quinquefolia</i>	Woodbine				* **	2
<i>Podophyllum peltatum</i>	Mayapple				8 SM	5

Latin Name	Common Name	Notes (nma for key)			Habitat	C
<i>Polygonum virginianum</i>	Woodland Knotweed				6 CLS	2
<i>Populus deltoides</i>	Cottonwood	2			4 SW	2
<i>Prenanthes alba</i>	Lion's Paw	5	9		18 SDM	5
<i>Prunus serotina</i>	Black Cherry				16 SD	1
<i>Prunus virginiana</i>	Choke Cherry	3			13 SD	1
<i>Quercus alba</i>	White Oak				12 SD	4
<i>Quercus rubra</i>	Red Oak				15 SDM	7
<i>Ranunculus abortivus</i>	Small-flowered buttercup				13 SDM	0
<i>Ranunculus septentrionalis</i>	Swamp buttercup				12 SWM	4
<i>Rhus radicans</i>	Poison Ivy	2			25 SW	2
<i>Ribes americanum</i>	Wild Black Currant	5	7		18 AT	7
<i>Ribes cynosbati</i>	Prickly Wild Gooseberry	5			14 SDM	5
<i>Rubus odoratus</i>	Purple Flowering Raspberry	5			* **	5
<i>Rudbeckia laciniata</i>	Tall Coneflower	7			13 SW	5
<i>Sanguinaria canadensis</i>	Bloodroot				12 SM	6
<i>Sanicula gregaria</i>	Black Snakeroot				11 SDM	2
<i>Scrophularia marilandica</i>	Late figwort				1 SDM	4
<i>Smilacina racemosa</i>	False Solomon's Seal	2			19 SD	2
<i>Smilacina stellata</i>	Starry Solomon's Plume	2	14		21 SD	5
<i>Smilax (ecirrhata)</i>	Upright Carrion Flower	2			13 SDM	5
<i>Solidago caesia</i>	Blue-stemmed Goldenrod	12			* **	7
<i>Solidago flexicaulis</i>	Zig-zag Goldenrod				9 SM	6
<i>Symplocarpus foetidus</i>	Skunk Cabbage	3	7	11	7 SWM	8
<i>Taenidia intergerrima</i>	Yellow pimpernel	2	26		6 SD	9
<i>Thalictrum (dasycarpum)</i>	Purple Meadow Rue	7			19 FN	5
<i>Thalictrum dioicum</i>	Early Meadow Rue				16 SDM	5
<i>Tilia americana</i>	Basswood				13 SM	5
<i>Trillium flexipes</i>	Declined Trillium	2	15		8 SDM	6
<i>Trillium grandiflorum</i>	Large Flowered Trillium				10 SM	8
<i>Ulmus americana</i>	White Elm	2			13 SWM	3
<i>Ulmus rubra</i>	Red Elm				10 SM	4
<i>Viburnum acerifolium</i>	Maple-leaved Viburnum	2	7		10 NDM	9
<i>Viburnum lentago</i>	Nannyberry				9 SDM	5
<i>Viburnum rafinesquianum</i>	Downy Arrow-wood	5			8 SDM	5
<i>Viola (sororia)</i>	Common Blue Violet				* **	3
<i>Viola pubescens</i>	Yellow Violet	3	7		11 SM	5
<i>Vitis riparia</i>	Wild Grape				22 SW	4
<i>Zizia aurea</i>	Golden Alexander	2	27		11 PW	7

Latin Name	Common Name	Notes (nma for key)				Habitat	C
Woodland North of Eastbrook	Ozaukee County, WI (R. 22E. T. 9 N., Section 19, the NW 1/4 of the SE 1/4 of the NE 1/4)						
Richard Barloga	7 acres						
transcribed by djc	Mesic forest and spring-fed wetland						
	April 24, 1993, April 26 1993, May 29 1993 July 31, 1993						
Latin Name	Common Name	Notes (nma for key)				Habitat	C
<i>Acer saccharum</i>	Sugar Maple					9 SM	3
<i>Agrimonia gryposepala</i>	Agrimony					9 SD	2
<i>Allium tricoccum</i>	Wild Leek	3				8 SM	7
<i>Amelanchier laevis</i>	Juneberry	2				* **	8
<i>Amphicarpa bracteata</i>	Hog Peanut	20	21			19 SDM	4
<i>Anemone quinquefolia</i>	Wood Anemone	2	26			18 NDM	7
<i>Arisaema triphyllum</i>	Jack in the Pulpit	9				13 SDM	5
<i>Aster furcatus</i>	Forked Aster	9	16	32		* **	10
<i>Aster lateriflorus</i>	Side Flowering Aster	9				11 SW	4
<i>Aster macrophyllus</i>	Largeleaf Aster	32				14 BF	10
<i>Aster sagittifolius</i>	Arrow-leaved Aster	2	9			12 SDM	5
<i>Athyrium filix-femina</i>	Lady Fern	2	9			14 SDM	8
<i>Betula papyrifera</i>	White Birch	2				15 NDM	10
<i>Caltha palustris</i>	Marsh Marigold	7	21			13 FN	5
<i>Cardamine douglassii</i>	Purple Spring Cress	9				2 SM	7
<i>Carex (deweyana)</i>	Sedge	9	20			3 SM	10
<i>Carex (gracilliana)</i>	Graceful Sedge	2	9			1 SWM	10
<i>Carex crinita</i>	Sedge	2	20	21	22	5 SWM	10
<i>Carex hirtifolia</i>	Hairy Wood Sedge	31				2 SM	5
<i>Carex lupulina</i>	Hop Sedge	2	20	21		2 SW	8
<i>Carex pennsylvanica</i>	Penn Sedge	3				16 SDM	5
<i>Carex tuckermani</i>	Sedge	19	20	21		2 SWM	10
<i>Carpinus caroliniana</i>	Musclewood					3 BF	8
<i>Carya cordiformis</i>	Yellowbud Hickory	2				8 SM	7
<i>Carya ovata</i>	Shagbark Hickory	4				12 OO	5
<i>Chelone glabra</i>	Turtlehead	2	20	21		9 AT	8
<i>Cicuta maculata</i>	Water Hemlock	2	20	21		14 pwm	6
<i>Cinna (arundinacea)</i>	Common Wood Reed	20	21			3 SW	5
<i>Circaea lutetiana</i>	Enchanter's Nightshade	2	9			13 SDM	1
<i>Claytonia virginica</i>	Spring Beauty	3				6 SM	2
<i>Cornus racemosa</i>	Gray Dogwood					21 SD	1
<i>Cornus stolonifera</i>	Red Dogwood	2				12 SC	6
<i>Crataegus sp.</i>	Hawthorn #1	2				* **	*
<i>Dentaria laciniata</i>	Toothwort	9				6 SM	5
<i>Erythronium albidum</i>	White Trout Lily	10				7 SM	5
<i>Erythronium americanum</i>	Yellow Trout Lily	3	10			3 NM	8
<i>Fagus grandifolia</i>	Beech					6 NM	10
<i>Fragaria virginiana</i>	Strawberry					25 ND	1
<i>Fraxinus americana</i>	White Ash					12 SDM	5
<i>Fraxinus pennsylvanica subintegerrima</i>	Green Ash	5				9 SWM	2
<i>Galim concinnum</i>	Shining Bedstraw	2	9			12 SDM	4
<i>Geranium maculatum</i>	Geranium	3	13			21 SDM	4
<i>Geum canadense</i>	White Avens					13 SDM	0
<i>Hamamelis virginiana</i>	Witch Hazel	2				8 NDM	8
<i>Hydrophyllum virginianum</i>	Waterleaf					10 SM	5
<i>Hystrix patula</i>	Bottlebrush Grass	3	20			9 SDM	5
<i>Impatiens (capensis)</i>	Orange Jewelweed	20	21			18 NWM	3
<i>Iris (versicolor)</i>	Blue Flag	6	21			4 BOG	5
<i>Laportea canadensis</i>	Wood Nettle	20	21			13 SW	3
<i>Lilium michiganense</i>	Turk's Cap Lily	9	11			19 PW	6
<i>Lonicera dioica</i>	Red Honeysuckle	2	30			8 SD	10
<i>Lysimachia ciliata</i>	Fringed Loosestrife	9	21			16 SWM	4
<i>Mainthemum canadense</i>	Canada Mayflower	2	9			18 BF	10
<i>Mitella diphylla</i>	Miterwort					9 MN	10
<i>Onoclea sensibilis</i>	Sensitive Fern	5	21			22 AT	8
<i>Ostrya virginiana</i>	Ironwood					10 SM	5
<i>Parthenocissus quinquefolia</i>	Woodbine	2				* **	2
<i>Penthorum sedoides</i>	Ditch Stonecrop	20	21			2 BEA	5
<i>Podophyllum peltatum</i>	Mayapple	2	24			8 SM	5
<i>Populus tremuloides</i>	Quaking Aspen					21 BF	4
<i>Potentilla simplex</i>	Old field Cinquefoil					16 SD	4

Latin Name	Common Name	Notes (nma for key)			Habitat	C
<i>Prunus serotina</i>	Black Cherry				16 SD	1
<i>Prunus virginiana</i>	Choke Cherry				13 SD	1
<i>Quercus alba</i>	White Oak				12 SD	4
<i>Quercus borealis</i>	Red Oak				15 SDM	7
<i>Quercus macrocarpa</i>	Bur Oak				17 OO	4
<i>Ranunculus abortivus</i>	Small-flowered buttercup	2	9		13 SDM	0
<i>Ranunculus septentrionalis</i>	Swamp buttercup				12 SWM	4
<i>Rhus radicans</i>	Poison Ivy	9	18		25 SW	2
<i>Ribes cynosbati</i>	Prickly Wild Gooseberry	2			14 SDM	5
<i>Sanguinaria canadensis</i>	Bloodroot	2	9		12 SM	6
<i>Saxifraga pensylvanica</i>	Swamp Saxifrage	21			13 PW	8
<i>Smilacina racemosa</i>	False Solomon's Seal	9			19 SD	2
<i>Smilax (ecirrhata)</i>	Upright Carrion Flower	2	9		13 SDM	3
<i>Smilax (lasioneura)</i>	Common Carrion Flower	2	9		* **	4
<i>Solidago (ulmifolia)</i>	Elmleaf Goldenrod				12 SDM	5
<i>Solidago flexicaulis</i>	Zig-zag Goldenrod	29			9 SM	6
<i>Solidago gigantea</i>	Late Goldenrod	9	12		16 PW	3
<i>Thalictrum dioicum</i>	Early Meadow Rue	9			16 SDM	5
<i>Tilia americana</i>	Basswood				13 SM	5
<i>Trillium flexipes</i>	Declined Trillium	2	9	17	8 SDM	6
<i>Trillium grandiflorum</i>	Large Flowered Trillium	2			10 SM	8
<i>Ulmus americana</i>	White Elm	2	25		13 SWM	3
<i>Uvularia grandiflora</i>	Bellwort	2	9		12 SDM	7
<i>Viburnum lentago</i>	Nannyberry				9 SDM	5
<i>Viburnum rafinesquianum</i>	Downy Arrow-wood	2	9		8 SDM	5
<i>Viola pubescens</i>	Yellow Violet	9			11 SM	5
<i>Viola sp.</i>	Common Blue Violet	2	27		* **	3
<i>Vitis riparia</i>	Wild Grape	2			22 SW	4

Latin Name	Common Name
Homestead Woods (north end)	Ozaukee County, WI (R. 21 E. T9, S23) SE 1/4 of NE 1/4
Nancy Aten / partial inventory	1.8 acres, 0.73 ha, Mesic forest
	Various from 1988 through 2009
Latin Name	Common Name
<i>Acer negundo</i>	Box Elder
<i>Acer rubrum</i>	Red Maple
<i>Acer saccharum</i>	Sugar Maple
<i>Actaea pachypoda</i>	White Baneberry
<i>Actaea rubra</i>	Red Baneberry
<i>Allium tricoccum</i>	Wild Leek
<i>Allium tricoccum</i> var. <i>burdickii</i>	Wild Leek
<i>Amelanchier laevis</i>	Alleghany Serviceberry
<i>Anemone canadensis</i>	Canada Anemone
<i>Anemone cinquefolia</i>	Wood Anemone
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit
<i>Asarum canadense</i>	Wild Ginger
<i>Aster macrophyllus</i>	Largeleaf Aster
<i>Botrychium virginianum</i>	Rattlesnake Fern
<i>Cardamine douglassii</i>	Purple Spring Cress
<i>Carex pensylvanica</i>	Penn Sedge
<i>Carex</i> spp.	Sede
<i>Carpinus caroliniana</i>	Musclewood
<i>Carya cordiformis</i>	Bitternut Hickory
<i>Carya ovata</i>	Shagbark Hickory
<i>Caulophyllum thalictroides</i>	Blue Cohosh
<i>Circaea lutetiana</i>	Enchanter's Nightshade
<i>Claytonia virginica</i>	Spring Beauty
<i>Cornus racemosa</i>	Gray Dogwood
<i>Crataegus</i> spp	Hawthorn
<i>Dentaria laciniata</i>	Toothwort
<i>Dirca palustris</i>	Leatherwood
<i>Erythronium albidum</i>	White Trout Lily
<i>Erythronium americanum</i>	Yellow Trout Lily
<i>Euonymus atropurpureus</i>	Eastern Wahoo
<i>Eupatorium rugosum</i>	White Snakeroot
<i>Fagus grandifolia</i>	Beech
<i>Floerkea proserpinacoides</i>	False Mermaid
<i>Fragaria virginiana</i>	Wild Strawberry
<i>Fraxinus americana</i>	White Ash
<i>Geranium maculatum</i>	Wild Geranium
<i>Hamamelis virginiana</i>	Witch Hazel
<i>Hepatica acutiloba</i>	Sharp-Lobed Hepatica
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
<i>Impatiens capensis</i>	Jewelweed
<i>Isopyrum biternatum</i>	False Rue Anemone
<i>Maianthemum racemosa</i>	Solomon's Plume
<i>Matteucia struthiopteris</i>	American Ostrich Fern
<i>Ostrya virginiana</i>	Ironwood
<i>Podophyllum peltatum</i>	Mayapple
<i>Polygonatum biflorum</i>	Solomon's Seal
<i>Potentilla simplex</i>	Old field Cinquefoil
<i>Prenanthes alba</i>	White Lettuce (Lion's Foot)
<i>Prunus serotina</i>	Black Cherry
<i>Prunus virginiana</i>	Choke Cherry
<i>Pteridium aquilinum</i>	Bracken Fern
<i>Quercus alba</i>	White Oak
<i>Quercus bicolor</i>	Swamp White Oak
<i>Quercus rubra</i>	Red Oak
<i>Ranunculus septentrionalis</i>	Swamp Buttercup
<i>Ribes cynosbati</i>	Gooseberry
<i>Sanguinaria canadensis</i>	Bloodroot
<i>Thalictrum dioicum</i>	Early Meadow Rue
<i>Tilia americana</i>	Basswood
<i>Trillium grandiflorum</i>	Large-Flowered Trillium
<i>Ulmus americana</i>	American Elm
<i>Uvularia grandiflora</i>	Bellwort
<i>Viburnum acerifolium</i>	Mapleleaf Viburnum

Latin Name	Common Name
<i>Viburnum lentago</i>	Nannyberry Viburnum
<i>Viburnum rafinesquianum</i>	Downy Arrowwood
<i>Viola pubescens</i>	Yellow Violet
<i>Viola sororia</i>	Common Blue Violet
<i>Vitis riparia</i>	Wild Grape

Fen	OO	Shared	Genus	Species	Common Name
Genesee Depot State Natural Area				Waukesha Co.	
Marc White, Riveredge Nature Center				Oak Opening and Fen	
				Sep 1, 2009	
Fen	OO	Shared	Genus	Species	Common Name
1	1	1	<i>Achillea</i>	<i>millefolium</i>	Yarrow
0	1	0	<i>Amorpha</i>	<i>canescens</i>	Leadplant
0	1	0	<i>Amphicarpaea</i>	<i>bracteata</i>	Hog Peanut
1	1	1	<i>Andropogon</i>	<i>gerardii</i>	Big Bluestem
0	1	0	<i>Anemone</i>	<i>cylindrica</i>	Thimbleweed
0	1	0	<i>Antenaria</i>	<i>neglecta</i>	Field Pussytoes
0	1	0	<i>Antenaria</i>	<i>neglecta</i>	Pussy Toes
0	1	0	<i>Apocynum</i>	<i>androsaemifolium</i>	Spreading Dogbane
0	1	0	<i>Aquilegia</i>	<i>canadensis</i>	Columbine
1	0	0	<i>Arenaria</i>	<i>stricta</i>	Rock sandwort
0	1	0	<i>Ascepias</i>	<i>exaltata</i>	Poke Milkweed
1	1	1	<i>Ascepias</i>	<i>syriaca</i>	Common Milkweed
0	1	0	<i>Asparagus</i>	<i>officinalis</i>	Wild Asparagus
1	0	0	<i>Aster</i>	<i>novae-angliae</i>	New England Aster
1	1	1	<i>Aster</i>	<i>oolentangiensis</i>	Sky Blue Aster
1	1	1	<i>Aster</i>	<i>sericeus</i>	Silky Aster
0	1	0	<i>Berteroa</i>	<i>incana</i>	Hoary Alyssum
0	1	0	<i>Besseyia</i>	<i>bullii</i>	Kittentails
0	1	0	<i>Carex</i>	<i>pennsylvanica</i>	Penn Sedge
1	0	0	<i>Carex</i>	<i>stricta</i>	Hummock Sedge
1	1	1	<i>Carya</i>	<i>ovata</i>	Shagbark Hickory
0	1	0	<i>Ceanothus</i>	<i>americanus</i>	New Jersey Tea
1	0	0	<i>Cirsium</i>	<i>muticum</i>	Swamp Thistle
1	1	1	<i>Comandra</i>	<i>umbellata</i>	Bastard Toadflax
0	1	0	<i>Coreopsis</i>	<i>palmata</i>	Prairie Coreopsis
1	1	1	<i>Cornus</i>	<i>racemosa</i>	Gray Dogwood
1	1	1	<i>Corylus</i>	<i>americana</i>	Hazelnut
1	0	0	<i>Cypripedium</i>	<i>calceolus var. pubescens</i>	Yellow Lady Slipper Orchid
0	1	0	<i>Dalea</i>	<i>candida</i>	White Prairie Clover
1	1	1	<i>Dalea</i>	<i>purpurea</i>	Purple Prairie Clover
1	1	1	<i>Desmodium</i>	<i>canadense</i>	Showy Tick-trefoil
0	1	0	<i>Desmodium</i>	<i>glutinatum</i>	Pointed-leaf Tick-trefoil
1	1	1	<i>Dodecatheon</i>	<i>meadia</i>	Shooting Star
1	1	1	<i>Equisetum</i>	<i>spp.</i>	Scouring Rush
1	1	1	<i>Erigeron</i>	<i>strigosus</i>	Daisy Fleabane
0	1	0	<i>Erigeron</i>	<i>pulchellus</i>	Robin's Plantain
1	0	0	<i>Eriophorum</i>	<i>spp.</i>	Cotton Grass
1	1	1	<i>Euphorbia</i>	<i>corollata</i>	Flowering Spurge
1	1	1	<i>Fragaria</i>	<i>virginiana</i>	Wild Strawberry
1	1	1	<i>Galium</i>	<i>boreale</i>	Northern Bedstraw
0	1	0	<i>Geranium</i>	<i>maculatum</i>	Wild Geranium
0	1	0	<i>Geum</i>	<i>canadense</i>	White Avens
1	0	0	<i>Helianthus</i>	<i>grosseserratus</i>	Sawtooth Sunflower
0	1	0	<i>Helianthus</i>	<i>occidentalis</i>	Western Sunflower
0	1	0	<i>Helianthus</i>	<i>strumosus</i>	Woodland Sunflower
0	1	0	<i>Helianthus</i>	<i>laetiflorus</i>	Stiff Sunflower
1	1	1	<i>Heliopsis</i>	<i>helioides</i>	False Sunflower
0	1	0	<i>Heuchera</i>	<i>richardsonii</i>	Alum Root
1	0	0	<i>Hypoxis</i>	<i>hirsuta</i>	Yellow Star Grass
0	1	0	<i>Juglans</i>	<i>nigra</i>	Black Walnut
1	0	0	<i>Krigia</i>	<i>biflora</i>	Two-flowered Cynthia
0	1	0	<i>Lespedeza</i>	<i>capitata</i>	Round-headed Bush-clover
0	1	0	<i>Liatris</i>	<i>aspera</i>	Rough blazing star
1	1	1	<i>Liatris</i>	<i>pycnostachya</i>	Prairie Blazing Star
1	0	0	<i>Lilium</i>	<i>michiganense</i>	Turk's Cap Lily
1	1	1	<i>Lithospermum</i>	<i>canescens</i>	Hoary Puccoon
1	1	1	<i>Monarda</i>	<i>fistulosa</i>	Bergamont
1	0	0	<i>Oenothera</i>	<i>biennis</i>	Evening Primrose
1	0	0	<i>Oxypolis</i>	<i>rigidior</i>	Cowbane
0	1	0	<i>Panicum</i>	<i>latifolium</i>	Broad-leaved Panic Grass
0	1	0	<i>Panicum</i>	<i>leibergii</i>	Leiberg's Panic Grass
0	1	0	<i>Panicum</i>	<i>oligosanthes</i>	Scribner's Panic Grass
0	1	0	<i>Parthenocissus</i>	<i>vitacea</i>	Thicket Creeper
0	1	0	<i>Phalaris</i>	<i>arundinacea</i>	Reed Canary Grass
1	1	1	<i>Phlox</i>	<i>pilosa</i>	Prairie Phlox
0	1	0	<i>Phryma</i>	<i>leptostachya</i>	Lopseed
0	1	0	<i>Polygala</i>	<i>senega</i>	Seneca Snakeroot
1	1	1	<i>Polygonatum</i>	<i>biflorum</i>	Smooth Solomon's Seal

Fen	OO	Shared	Genus	Species	Common Name
1	0	0	<i>Populus</i>	<i>tremuloides</i>	Quaking Aspen
0	1	0	<i>Potentilla</i>	<i>arguta</i>	Tall Cinquefoil
1	1	1	<i>Potentilla</i>	<i>fruticosa</i>	Shrubby Cinquefoil
0	1	0	<i>Prenanthes</i>	<i>alba</i>	Lion's Foot
1	1	1	<i>Pycnanthemum</i>	<i>virginianum</i>	Virginia Mountain Mint
0	1	0	<i>Quercus</i>	<i>alba</i>	White Oak
1	0	0	<i>Quercus</i>	<i>macrocarpa</i>	Bur Oak
1	0	0	<i>Quercus</i>	<i>rubra</i>	Red Oak
0	1	0	<i>Quercus</i>	<i>velutina</i>	Black Oak
1	0	0	<i>Ratibida</i>	<i>pinnata</i>	Gray-headed Coneflower
0	1	0	<i>Rhamnus</i>	<i>cathartica</i>	Common Buckthorn
1	0	0	<i>Rhus</i>	<i>glabra</i>	Smooth Sumac
1	1	1	<i>Rosa</i>	<i>caroliniensis</i>	Carolina Rose
1	1	1	<i>Rubus</i>	<i>idaeus var. strigosus</i>	Raspberry
1	0	0	<i>Rudbeckia</i>	<i>hirta</i>	Black-eyed Susan
0	1	0	<i>Sanicula</i>	<i>gregaria</i>	Black Snakeroot
0	1	0	<i>Sanicula</i>	<i>gregaria</i>	Clustered Black Snakeroot
1	1	1	<i>Schizachyrium</i>	<i>scoparium</i>	Little Bluestem
1	0	0	<i>Silphium</i>	<i>integrifolium</i>	Rosinweed
1	0	0	<i>Silphium</i>	<i>terebinthinaceum</i>	Prairie Dock
1	1	1	<i>Sisyrinchium</i>	<i>campestre</i>	Prairie Blue-eye Grass
1	1	1	<i>Smilacina</i>	<i>racemosa</i>	Common False Solomon's Seal
1	1	1	<i>Smilacina</i>	<i>stellata</i>	Starry False Solomon's Seal
0	1	0	<i>Smilax</i>	<i>ecirrhata</i>	Upright Carrion Flower
0	1	0	<i>Smilax</i>	<i>herbacea var. lasioneuria</i>	Common Carrion Flower
1	0	0	<i>Solidago</i>	<i>canadensis</i>	Canada Goldenrod
1	0	0	<i>Solidago</i>	<i>juncea</i>	Early Goldenrod
1	1	1	<i>Solidago</i>	<i>rigida</i>	Stiff Goldenrod
0	1	0	<i>Solidago</i>	<i>speciosa</i>	Showy Goldenrod
0	1	0	<i>Sorghastrum</i>	<i>nutans</i>	Indian Grass
1	0	0	<i>Spartina</i>	<i>pectinata</i>	Prairie Cordgrass
0	1	0	<i>Stipa</i>	<i>spartea</i>	Needlegrass
1	1	1	<i>Streptopus</i>	<i>roseus</i>	Twisted Stalk
0	1	0	<i>Taenidia</i>	<i>integerrima</i>	Yellow Pimpernel
1	1	1	<i>Thalictrum</i>	<i>dasycarpum</i>	Purple Meadow Rue
1	0	0	<i>Toxicodendron</i>	<i>radicans</i>	Poison Ivy
0	1	0	<i>Tradescantia</i>	<i>ohiensis</i>	Spiderwort
1	0	0	<i>Veronicastrum</i>	<i>virginicum</i>	Culver's Root
1	1	1	<i>Vicia</i>	<i>americana</i>	American Vetch
1	0	0	<i>Viola</i>	<i>cucullata</i>	Marsh Blue Violet
0	1	0	<i>Viola</i>	<i>pedata</i>	Birdsfoot Violet
0	1	0	<i>Viola</i>	<i>pedatifida</i>	Prairie Violet
0	1	0	<i>Vitis</i>	<i>riparia</i>	Riverbank Grape
0	1	0	<i>Xanthoxylum</i>	<i>americanum</i>	Pickly Ash
1	1	1	<i>Zigadenus</i>	<i>elegans var. glaucus</i>	White Camus
1	1	1	<i>Zizia</i>	<i>aurea</i>	Golden Alexander
63	88	37			

Messenger Dry Prairies		Waukesha Co.				
Partial Inventories provided by Thomas Meyer to N. Aten						
Xeric Prairie map 1 NW 1/4, NE 1/4 Sec 35 T6N R17E						
Xeric Prairie map 2 NE 1/4, NW 1/4 Sec 35 T6N R17E						
					UWSP	transcribed djc 1/6/2011
#1	#2	Genus	Species	Common Name	C	UWSP name used (blue = changed name)
	1	<i>Amorpha</i>	<i>canescens</i>	Leadplant	7	<i>Amorpha canescens</i> Pursh
	1	<i>Andropogon</i>	<i>gerardii</i>	Big Bluestem	4	<i>Andropogon gerardii</i> Vitman
1	1	<i>Andropogon</i>	<i>scoparius</i>	Little Bluestem	4	<i>Schizachyrium scoparium</i> (Michx.) Nash
1	1	<i>Anemone</i>	<i>patens</i>	Pasque flower	7	<i>Anemone patens</i> L. var. <i>multifida</i> Pritz.
1		<i>Antennaria</i>	<i>neglecta</i>	Pussy Toes	3	<i>Antennaria neglecta</i> Greene
	1	<i>Apocynum</i>	<i>sibiricum</i>	Indian Hemp	3	<i>Apocynum sibiricum</i> Jacq.
	1	<i>Aristida</i>	<i>sp</i>	Needlegrass	4	<i>Aristida purpurascens</i> Poir. var. <i>purpurascens</i>
	1	<i>Aster</i>	<i>sericeus</i>	Silky Aster	8	<i>Aster sericeus</i> Vent.
1	1	<i>Besseyia</i>	<i>bullii</i>	Kittentails	9	<i>Besseyia bullii</i> (Eaton) Rydb.
1	1	<i>Bouteloua</i>	<i>curtipendula</i>	Side-oats grama	6	<i>Bouteloua curtipendula</i> (Michx.) Torr. var. <i>curtipendula</i>
1		<i>Carya</i>	<i>ovata</i>	Shagbark Hickory	5	<i>Carya ovata</i> (Mill.) K.Koch var. <i>ovata</i>
1		<i>Ceanothus</i>	<i>americanus</i>	New Jersey Tea	9	<i>Ceanothus americanus</i> L.
	1	<i>Coreopsis</i>	<i>palmata</i>	Prairie Coreopsis	8	<i>Coreopsis palmata</i> Nutt.
1	1	<i>Dodecatheon</i>	<i>meadia</i>	Shooting Star	7	<i>Dodecatheon meadia</i> L. subsp. <i>meadia</i>
	1	<i>Euphorbia</i>	<i>corollata</i>	Flowering Spurge	4	<i>Euphorbia corollata</i> L.
	1	<i>Geum</i>	<i>triflorum</i>	Prairie smoke	7	<i>Geum triflorum</i> Pursh var. <i>triflorum</i>
1		<i>Hieracium</i>	<i>longipilum</i>	Longhair hawkweed	6	<i>Hieracium longipilum</i> Torr. ex Hook.
1		<i>Hypoxis</i>	<i>hirsuta</i>	Yellow Star Grass	8	<i>Hypoxis hirsuta</i> (L.) Coville
1		<i>Juniper</i>	<i>virginiana</i>	Red Cedar	3	<i>Juniperus virginiana</i> L. var. <i>virginiana</i>
1		<i>Lespedeza</i>	<i>capitata</i>	Round-headed Bush-clover	5	<i>Lespedeza capitata</i> Michx.
	1	<i>Liatris</i>	<i>aspera</i>	Rough blazing star	5	<i>Liatris aspera</i> Michx.
	1	<i>Liatris</i>	<i>cylindracea</i>	Dwarf blazing star	9	<i>Liatris cylindracea</i> Michx.
1		<i>Lithospermum</i>	<i>canescens</i>	Hoary Puccoon	10	<i>Lithospermum canescens</i> (Michx.) Lehm.
	1	<i>Lithospermum</i>	<i>carolinense</i>	Puccoon	10	<i>Lithospermum carolinense</i> (Walter ex J.F.Gmel.) Mac
	1	<i>Monarda</i>	<i>fistulosa</i>	Bergamont	3	<i>Monarda fistulosa</i> L. subsp. <i>fistulosa</i>
1		<i>Petalostemum</i>	<i>purpureum</i>	Purple prairie clover	7	<i>Dalea purpurea</i> Vent. var. <i>purpurea</i>
	1	<i>Petalostemum</i>	<i>candidum</i>	Purple prairie clover	7	<i>Dalea purpurea</i> Vent. var. <i>purpurea</i>
	1	<i>Populus</i>	<i>tremuloides</i>	Quaking Aspen	2	<i>Populus tremuloides</i> Michx.
1		<i>Potentilla</i>	<i>arguta</i>	Tall Cinquefoil	7	<i>Potentilla arguta</i> Pursh subsp. <i>arguta</i>
1		<i>Quercus</i>	<i>alba</i>	White Oak	7	same
1		<i>Quercus</i>	<i>macrocarpa</i>	Bur Oak	5	<i>Quercus macrocarpa</i> Michx.
	1	<i>Ratibida</i>	<i>pinnata</i>	Gray-headed Coneflower	4	<i>Ratibida pinnata</i> (Vent.) Barnhart
1	1	<i>Rhus</i>	<i>glabra</i>	Smooth Sumac	2	<i>Rhus glabra</i> L.
1		<i>Rosa</i>	<i>sp</i>	Rose	4	<i>Rosa blanda</i> Aiton
1		<i>Rudbeckia</i>	<i>hirta</i>	Black-eyed Susan	4	<i>Rudbeckia hirta</i> L. var. <i>pulcherrima</i> Farw.
1	1	<i>Sisyrinchium</i>	<i>campestre</i>	Prairie Blue-eye Grass	7	<i>Sisyrinchium campestre</i> E.P.Bicknell
1		<i>Solidago</i>	<i>nemoralis</i>	Gray goldenrod	4	<i>Solidago nemoralis</i> Aiton
1		<i>Sorghastrum</i>	<i>nutans</i>	Indian Grass	5	<i>Sorghastrum nutans</i> (L.) Nash
1	1	<i>Sporobolus</i>	<i>heterolepis</i>	Prairie dropseed	10	<i>Sporobolus heterolepis</i> (A.Gray) A.Gray
1		<i>Tradescantia</i>	<i>ohiensis</i>	Spiderwort	5	<i>Tradescantia ohiensis</i> Raf.
1	1	<i>Viola</i>	<i>pedata</i>	Birdsfoot Violet	7	<i>Viola pedata</i> L.
1	1	<i>Viola</i>	<i>pedatifida</i>	Prairie Violet	9	<i>Viola pedatifida</i> G.Don

FQI for Reference Sites considered for Menomonee Valley Air-Line Yards Site									
	Eastbrook Woodland, Mequon	Seminary Woods, St. Francis	Pleasant Valley SNA, Dane County	Genesee Depot	Hawthorn Glen, Milwaukee	Homestead Woods, Mequon	Messenger Xeric Prairie map 1	Messenger Xeric Prairie map 2	Messenger Xeric Prairie combined
Sum of Cs	425	479	1609	683	379	380	165	153	243
n	89	98	319	110	88	81	27	25	41
Sqrt n	9.4	9.9	17.9	10.5	9.4	9.0	5.2	5.0	6.4
Mean C	4.8	4.9	5.0	6.2	4.3	4.7	6.1	6.1	5.9
FQI (Mean C * Sqrt n)	45.0	48.4	90.1	65.1	40.4	42.2	31.8	30.6	38.0
Notes:									
1. Coefficient of Conservatism (C) values from UWSP Robert W. Freckmann Herbarium									
2. FQA values (mean C and FQI) for a site must be considered in relation to other sites within the same region. As this method becomes more widely used and the range of FQA values for a given region becomes known, future site values will be more meaningful.									
Dan Collins Landscapes of Place, LLC									