Natural Resources Inventory of the City of Bloomington, Minnesota

City of Bloomington
Natural Resources Inventory and
Minnesota Land Cover Classification System Mapping

Prepared for the City of Bloomington and
Hennepin County Department of Environmental Services

by

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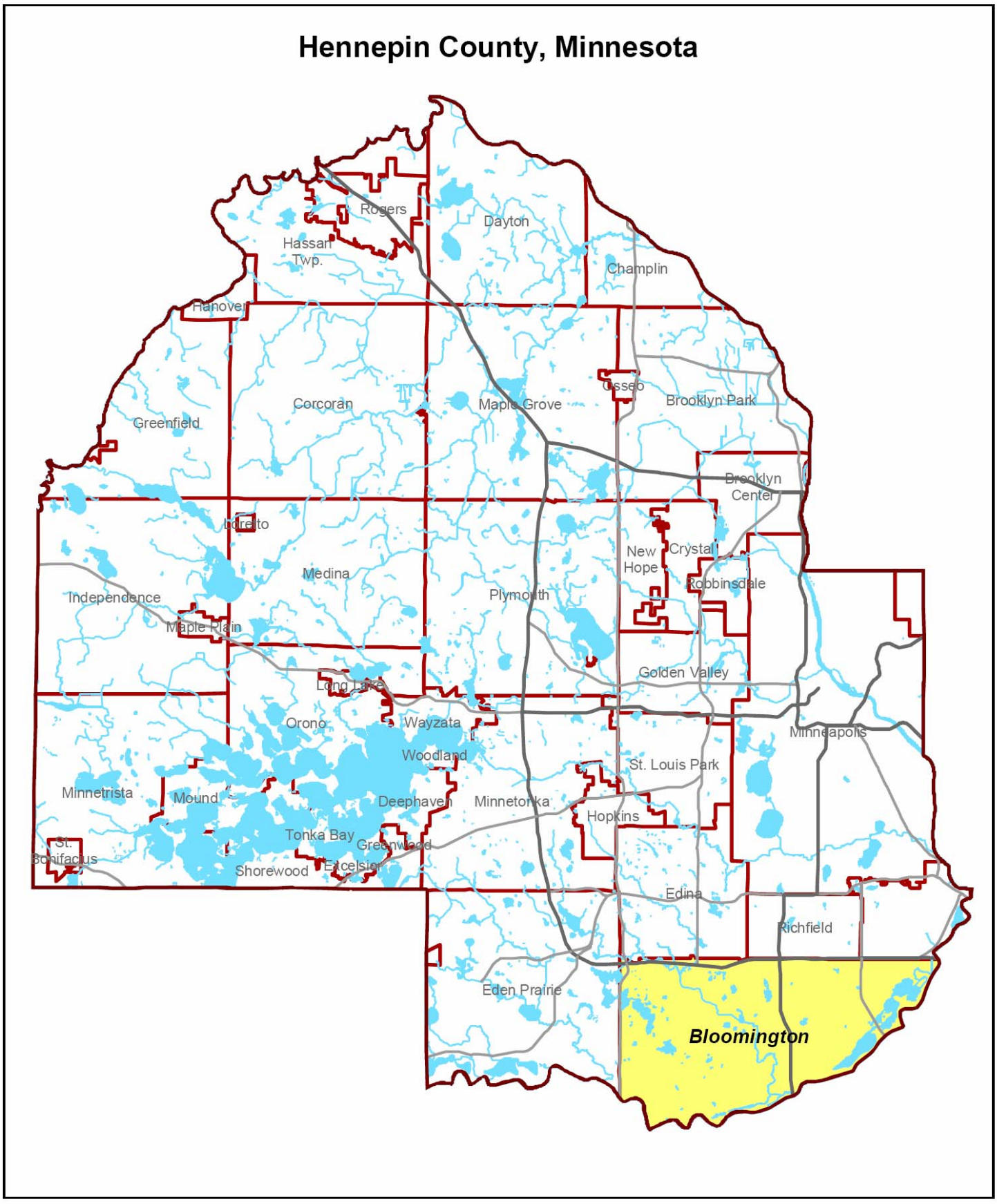
INTRODUCTION

In 2005, Hennepin County Department of Environmental Services (HCDES) retained Great River Greening (GRG) to conduct land cover classification mapping and a natural areas assessment within the City of Bloomington, in Hennepin County, Minnesota (**Figure 1**). The Minnesota Land Cover Classification System (MLCCS) methodology (**Appendix D**) that was developed by the Minnesota Dept. of Natural Resources was utilized for this project. This project was funded by Hennepin County and the City of Bloomington.

The goal of the project was to divide and classify the area constituting the City of Bloomington into appropriate land cover types, assess the relative ecological quality of the remaining natural and semi-natural areas, and recommend potential natural resources/open space corridors and management considerations. During the spring and summer of 2006 and 2007, the land cover areas, as determined through the use of aerial photo interpretation, were field checked in order to confirm and/or correct boundaries and land cover type designation. During the field check phase of the project, species lists for natural area polygons and other site appropriate coding modifiers were recorded.

GRG staff identified 3297 distinct landscape areas within the municipal boundary for the City of Bloomington. All land cover was coded to the highest level of detail (Level 5) and approximately 84% of all land-use polygons were field checked at least from the edge (level 2) or higher. During the 2006/2007 field season all land cover areas identified through the air photo mapping process were field checked. All natural and semi-natural area land cover areas were visited by staff ecologists. Natural area polygons (not entirely dominated by non-native species or sufficiently disturbed to warrant an altered ranking) were field checked to a level 3 (partially visited) or level 4 (entirely visited) with species lists and DNR rankings attributed to each.

During the field check process, 368 natural area polygons were identified to be of sufficient quality to receive Natural Community Quality Rankings according to the DNR's Natural Heritage Element Occurrence Ranking Guidelines. Of the 368 natural areas, 3 were provided with the highest quality (A) ranking. Of the highest quality natural communities, there is one a high quality wetland community (Poor Fen, Sedge Subtype), a dry prairie and a dry prairie, sand-gravel subtype. 106 natural areas were given a good quality natural condition (B) ranking. For the most part, the B ranked communities are high quality wetland and floodplain communities with limited encroachment by non-native invasive species as is typical of urban natural communities. 118 natural communities were ranked as moderate quality (C) with the remainder ranked as poor quality (D) natural communities. The primary factor that determines the quality of natural communities in this urbanized community tends to be the presence or dominance of non-native, invasive species within natural community remnants and the extent of cultural uses within a remnant natural area. Given the urbanized nature of Bloomington, the identification of these remnant natural communities can serve as a valuable planning tool for the City, residents and planners in determining valuable natural resources in need of protection.



Project Location Map

City of Bloomington Land Cover Classification and Natural Resource Inventory

0 2 4 8 Miles

Figure 1

PROJECT METHODOLOGY

BACKGROUND INFORMATION

Ecologists from Great River Greening and staff from Hennepin County Department of Environmental Services reviewed available historical records on past and present ecological conditions. These data included presettlement vegetation, Minnesota DNR County Biological Survey (MCBS) information for Hennepin County, wetland and water resource information, and the Hennepin County soil survey. Specific results from these examinations are reviewed by category in the following paragraphs to provide background details with which to better understand land use changes since the widespread settlement of the area.

Pre-settlement Vegetation

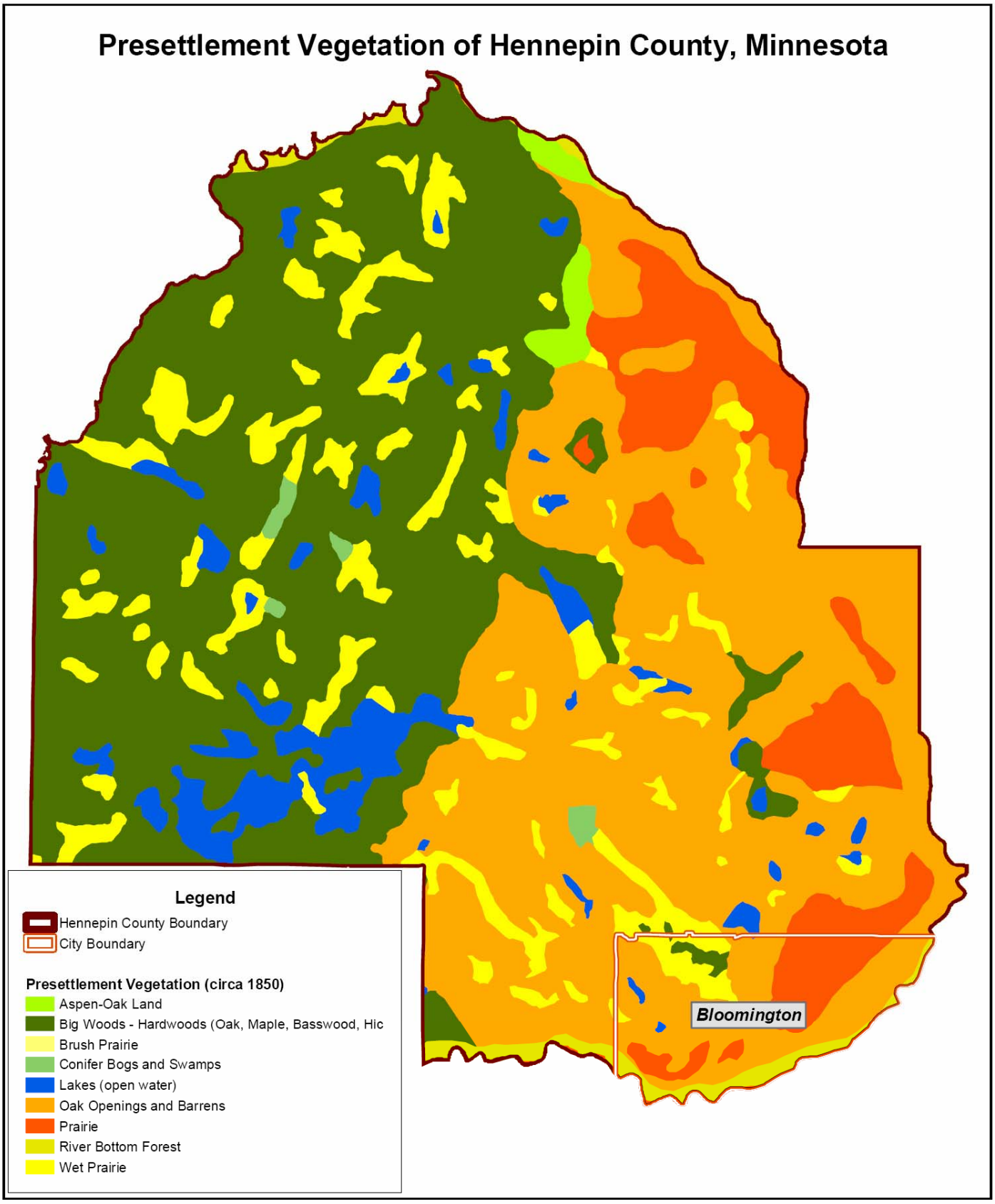
According to the original land survey notes (compiled in Minnesota between 1853 and 1856), the pre-settlement vegetation of what is now the City of Bloomington was comprised primarily of "Oak Openings and Barrens" and large inclusions of "Prairie" (Marschner 1974). Several of the large inclusions of prairie were found along the bluffs of the Minnesota River, with the largest area extending north and east from the river bluffs and occupying approximately one-third of Eastern Bloomington. A large portion of Northwestern Bloomington was comprised of a contiguous block of "Wet Prairie" embedded with areas of "Big Woods" of various sizes. The toe-slopes and river bottoms of the north-side of the Minnesota River were occupied by "River Bottom Forest" (**Figure 2**).

Oak Openings and Barrens, located east of the Big Woods, was an area of fire-maintained vegetation that formed a transition zone between open prairies and unburned hardwood forests (Heinselman 1974). This area was dominated by various oak species including bur, red, white, and northern pin oak, with areas of aspen, hazel, and prickly ash as key undergrowth components. Small areas of prairie were also present. Unlike the Big Woods, this area was prone to periodic wild fires, which decreased in frequency and

intensity along a gradient from open prairies in eastern Hennepin County to the edge of the Big Woods in central Hennepin County (Grimm 1984). Areas identified as "Wet Prairie" include a broad range of wetland types, from seasonally inundated grasslands on mineral soil to cattail marshes and sedge and reed-covered peatlands (Heinselman 1974).

The Big Woods was a large region of fire-protected hardwood forests that covered the western half of Hennepin County. Big Woods are sometimes described as "asbestos forests" because, once formed, their cool interior does not burn easily. The Big Woods formed primarily in fire protected areas such as uplands within wet prairie in the more fire-prone southeastern portions of Hennepin County. These forests were dominated primarily by American elm, red oak, basswood, and sugar maple. These forests were noted for containing a wide diversity of forest plants, including numerous spring ephemeral wildflowers.

River bottom forest was comprised predominantly of floodplain forest which was dominated by elm, ash, cottonwood, box elder, silver maple, willow, aspen and hackberry.



Presettlement Vegetation Map

City of Bloomington Land Cover Classification and Natural Resource Inventory

Figure 2

National Wetlands Inventory (NWI)

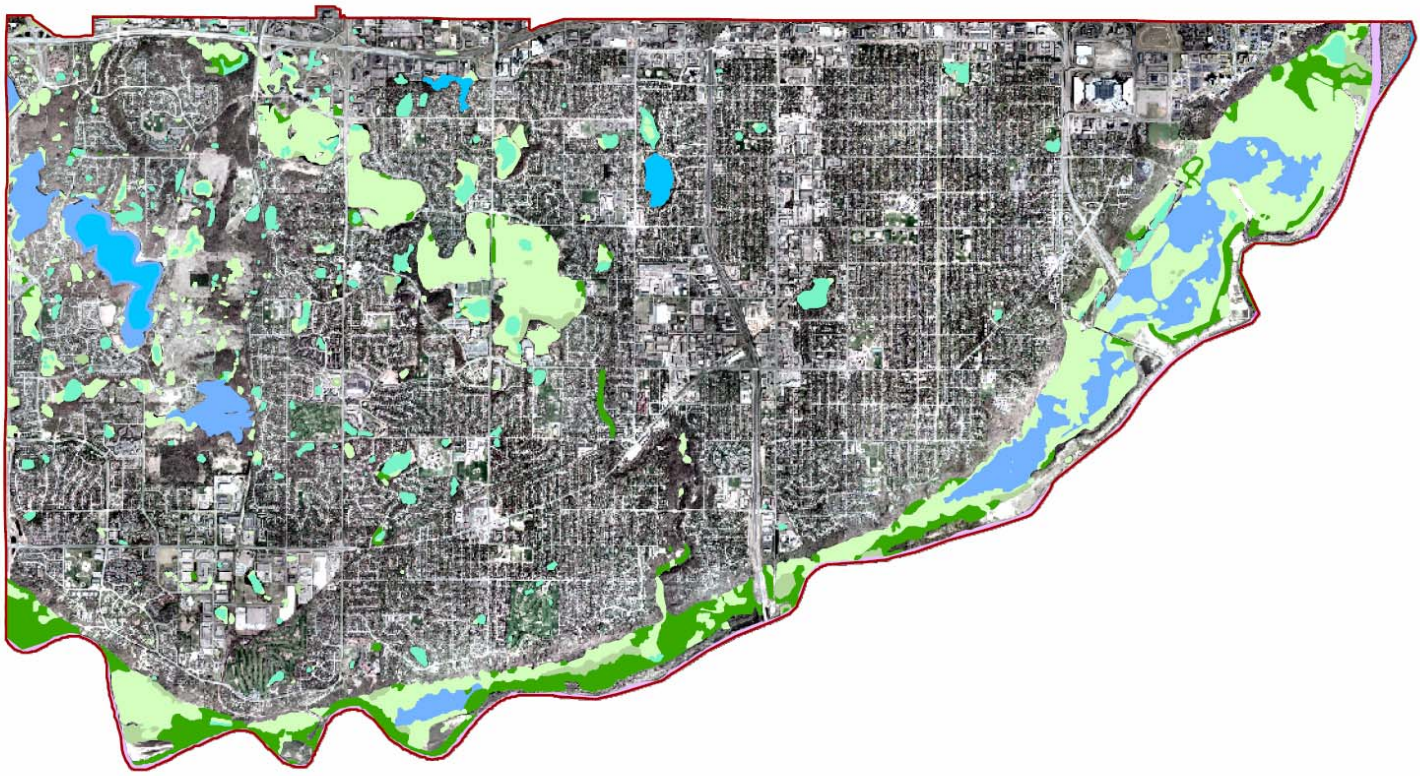
Figure 3 shows the NWI map for Bloomington. The NWI is a national assessment of wetland resources, conducted by the United States Fish and Wildlife Service between 1988 and 1992 within the state of Minnesota. The NWI survey was based strictly on aerial photography reconnaissance and interpretation. However, the NWI coverage is useful in giving an estimate of the extent (i.e. approximate geographic location) and type (i.e. system, hydrologic regime, and predominant vegetation types) of wetlands within the city.

Hennepin County Soil Survey

Figure 4 shows the Soil Survey Slope Gradients for Bloomington. This map is based on soils descriptions for slope class, and provides a good picture of Bloomington topographic and soils features from the Minnesota River valley along the south to the outwash plains of the east, and rolling glacial till topography of the western uplands. Northwestern Bloomington is dominated by two broad soil descriptions. The first, which is almost exclusively found in the undeveloped or lower density residential areas, is characterized by a fine-grained mosaic of mostly sand-loam complexes with areas of silt and silt-clay loams all of which are derived from till. The smaller depressions found within this area are characterized by poorly drained muck derived from organic material. The adjacent, highly urbanized areas are characterized by what are called urban land-udorthents, which are highly disturbed soils comprised largely by fill material and occur in areas with a high percentage of impervious surfaces. This urban fill is what almost exclusively comprises all of central to northeastern Bloomington, which is highly urbanized. Southwestern Bloomington is characterized by sandy-loams derived from both till and outwash parent materials with inclusions of urban fill, with soils derived from organic material almost completely absent. The bluff tops and slopes along the north side of the Minnesota River are comprised exclusively of a loamy sand complex called Hawick and are derived from glacial outwash. The adjacent river bottom or floodplain is characterized by two main soil types. The backwater areas and those generally adjacent to the toe-slope are comprised of muck, while areas directly adjacent to the river are comprised of fine sandy-loams from alluvial deposition.

National Wetlands Inventory

City of Bloomington Land Cover Classification and Natural Resources Inventory



Legend

- City Boundary
- National Wetland Inventory
- Lacustrine: Limnetic, Unconsolidated Bottom
- Lacustrine: Littoral, Emergent
- Lacustrine: Littoral, Aquatic Bed
- Lacustrine: Littoral, Unconsolidated Bottom
- Lacustrine: Littoral, Unconsolidated Shore
- Palustrine: Emergent
- Palustrine: Scrub-Shrub
- Palustrine: Forested
- Palustrine: Aquatic Bed
- Palustrine: Unconsolidated Bottom
- Palustrine: Unconsolidated Shore
- Riverine: Lower Perennial, Unconsolidated Bottom
- Riverine: Lower Perennial, Unconsolidated Shore

N

0 3,500 7,000 14,000 Feet

Figure 3

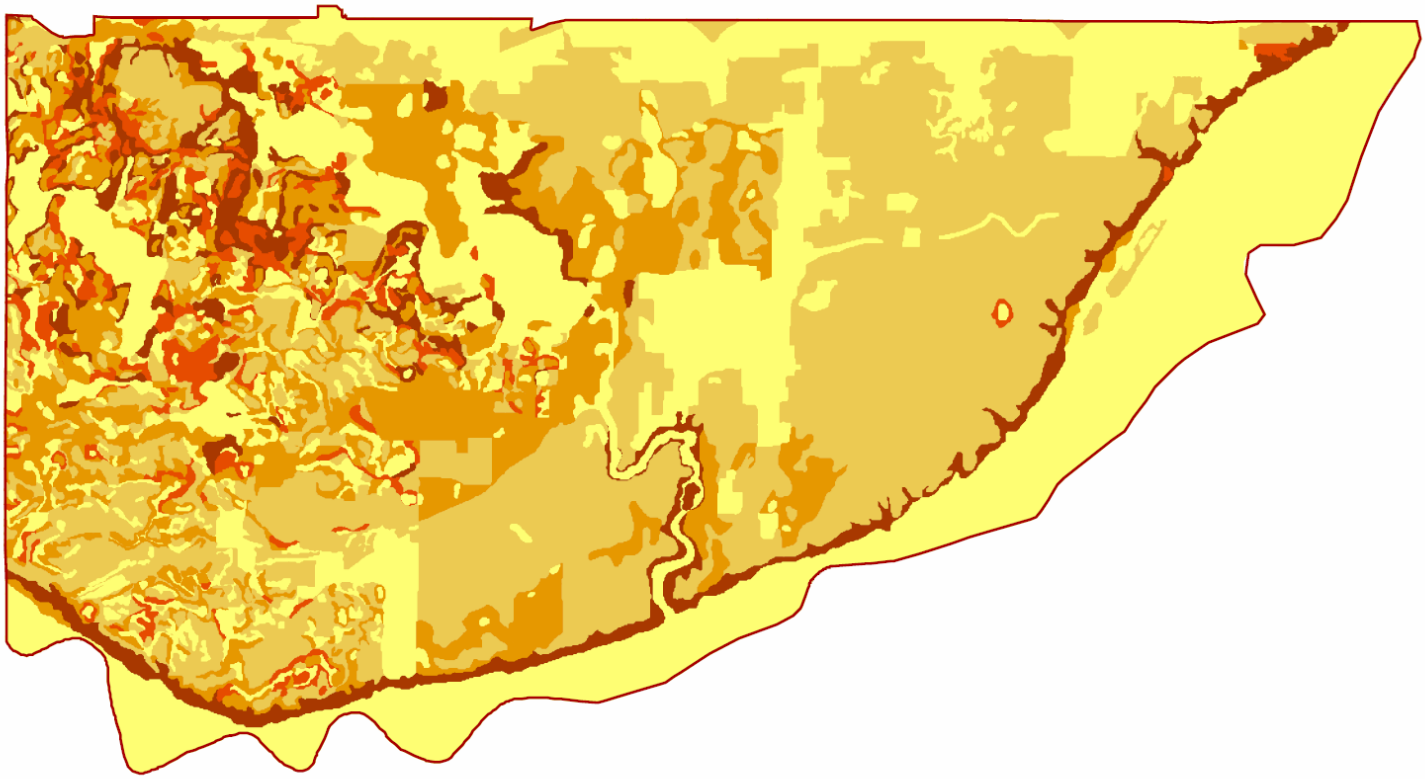
Soil Survey Slope Gradient Map

City of Bloomington Land Cover Classification
and Natural Resources Inventory

0 3,500 7,000 14,000 Feet

1 inch equals 7,000 feet

N



Legend

City Boundary

Soils Data - Slope Gradient

Slopes

- 0 - 2%
- 2 - 6%
- 6 - 12%
- 12 - 18%
- 18 - 35%

Figure 4

Minnesota County Biological Survey (MCBS)

Figure 5 shows native plant communities mapped by the MCBS in the City of Bloomington. In 1995, the Minnesota County Biological Survey conducted a comprehensive inventory of remaining high quality natural communities and rare plant and animal species within Hennepin, Carver, and Scott Counties (MCBS, 1998). Although much of the remnant natural vegetation within the City of Bloomington was reviewed through aerial photography and ground surveys during that inventory, a small subset of these remnants were of high enough quality to be surveyed in detail and included in the county biological survey. Other remnants were either too degraded to be considered of high enough quality for inclusion in the survey or were not recorded due to their size and/or accessibility. All together there are 73 natural communities included in the MCBS within the City of Bloomington (**Figure 5**).

- 8 Black Ash Swamps
- 3 Cattail Marshes
- 13 Emergent Marshes
- 8 Dry Prairie – Sand-gravel subtype
- 17 Floodplain Forest – Silver maple subtype
- 3 Lowland Hardwood Forest
- 1 Oak Forest – Dry subtype
- 2 Oak Forest – Mesic subtype
- 7 Oak Woodland/Brushland
- 2 Poor Fen – Sedge subtype
- 11 Wet Meadows

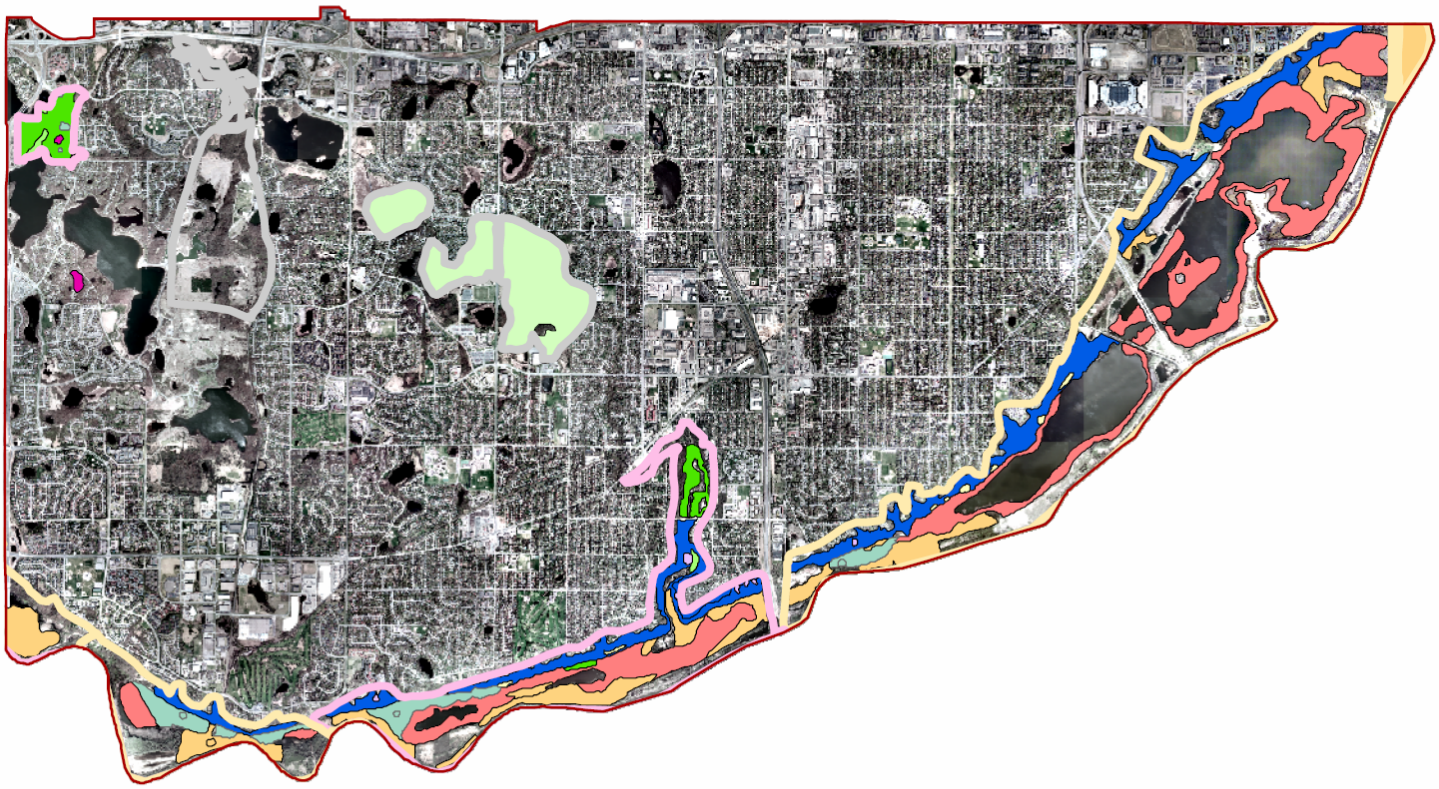
County Biological Survey Sites

City of Bloomington Land Cover Classification
and Natural Resources Inventory

0 3,500 7,000 14,000 Feet

1 inch equals 7,000 feet

N



Legend

City Boundary

CBS Biodiversity Ranking for Other Sites

- OUTSTANDING
- HIGH
- MODERATE
- BELOW MINIMUM DIVERSITY STANDARDS

County Biological Survey: Natural Communities

- ASPEN FOREST
- ASPEN WOODLAND
- BLACK ASH SWAMP
- CATTAIL MARSH
- DRY OAK SAVANNA
- DRY PRAIRIE
- EMERGENT MARSH
- FLOODPLAIN FOREST
- HARDWOOD SWAMP FOREST
- LOWLAND HARDWOOD FOREST
- MAPLE-BASSWOOD FOREST (BIG WOODS)
- MESIC HARDWOOD FOREST SYSTEM
- MESIC OAK SAVANNA (CENTRAL)
- MESIC PRAIRIE
- MIXED EMERGENT MARSH (FOREST)
- MIXED HARDWOOD SWAMP
- OAK FOREST
- OAK WOODLAND-BRUSHLAND (BIG WOODS)
- POOR FEN SEDGE SUBTYPE
- RED OAK - SUGAR MAPLE - BASSWOOD - (BITTERNUT HICKORY) FOREST
- RICH FEN (TRANSITION)
- RICH FEN (TRANSITION) SHRUB SUBTYPE
- SEDGE MEADOW
- SEEPAGE MEADOW (SOUTHERN)
- SHRUB SWAMP
- SILVER MAPLE - (VIRGINIA CREEPER) FLOODPLAIN FOREST
- SILVER MAPLE - GREEN ASH - COTTONWOOD TERRACE FOREST
- SUGAR MAPLE FOREST (BIG WOODS)
- TAMARACK SWAMP
- WET MEADOW
- WILLOW - DOGWOOD SHRUB SWAMP
- WILLOW SWAMP

Figure 5

LAND COVER CLASSIFICATION

Minnesota Land Cover Classification System (MLCCS)

Version 5.4 of the MLCCS dichotomous key (Appendix D) was used to classify land cover within the City of Bloomington. As a brief introduction as to how MLCCS works and relates to this project here are excerpts from the MLCCS manual explaining the fundamental elements of the MLCCS:

> The Minnesota Land Cover Classification System (MLCCS) integrates classification of cultural features, non-native vegetation, natural and semi-natural vegetation into a comprehensive land cover classification system. The overall objective of the MLCCS is to standardize land cover identification and interpretation. The MLCCS was developed as a result of unanswered questions regarding natural resource identification, protection and restoration efforts in the seven-county metropolitan area. The MLCCS is unique in that it emphasizes vegetation land cover instead of land use, thus creating a land cover inventory especially useful for resource managers and planners.
>
> The classification system is a five-level hierarchical design, permitting a gradation of refinement relevant to any land cover mapping project. The very highest level, or the system level, is the division between Natural/Semi-Natural cover types and Cultural cover types. Cover types in the Natural/Semi-Natural system are composed of all naturally occurring types and are subdivided into Forests, Woodlands, Shrublands, Herbaceous, Nonvascular, Sparse Vegetation and Water. The Cultural classification system is composed of cover types influenced by humans, and are subdivided into areas with > 4% Artificial Surfaces and Cultural Vegetation.
>
> For each polygon identified, modifiers may be added to further define the characteristics of the site. Possible modifier codes include imperviousness, land use, vegetation disturbances or management, natural quality, tree species, forestry (e.g., percent canopy and DBH) and water regimes.
>
> Typical data needed to identify land cover using the MLCCS includes Minnesota County Biological Surveys, County Soil Surveys, National Wetland Inventory, Color infrared aerial photographs, digital orthophoto quadrangles and rare features data from the Natural Heritage Information System (obtained by filling out a Data Request Form, available on the DNR's web site, or obtained from the Section of Ecological Services, MN DNR). This base information is usually sufficient to identify polygons to the third level of the MLCCS codes. Field inspection by ecologists is usually required for modifier attributes and to identify natural community types in the fourth and fifth levels of the MLCCS. Field inspection is also used to confirm and refine polygon delineation.

The complete MLCCS manual, metro region status map, and MLCCS fact sheet can be viewed/downloaded on the MN DNR web site at the following address: http://www.dnr.state.mn.us/mlccs/index.html

AERIAL PHOTO INTERPRETATION/REMOTE SENSING

Great River Greening ecologists, in March – September of 2006, photo interpreted, coded, and digitized the City of Bloomington. Base maps used for drawing land cover polygons were provided by Hennepin County Department of Environmental Services (HCDES) and consisted of low altitude, high resolution color photography from 2004 printed at a scale of 1 inch = 200 feet. Additional information also used in identifying land cover polygons was overlain on the base maps and included county and municipal boundaries, parcel boundaries, the Hennepin County Soil Survey (with hydric soils highlighted), the NWI, the Hennepin County Wetland Inventory, and the MCBS areas. To aid in photo interpretation of community structure and species composition, the 1994 MN DNR 1:15,840, fall leaf-on color infrared aerial photos were also used. All sections within the City of Bloomington were digitized using the same Hennepin County 2004 True Color Orthophotography Background photos that were used for the photo interpretation.

FIELD EVALUATION

All cultural land cover areas were field checked in August - September 2006, while natural and semi-natural areas were field checked from August 2006 to August 2007. Activities performed during field evaluation in addition to confirming landcover type and boundaries, included recording and/or updating as necessary appropriate MLCCS modifiers, as explained below. All natural area polygons, in addition to receiving natural quality rank and invasive species modifiers, were thoroughly catalogued with detailed species lists (Appendix B). Scientific nomenclature follows the DNR's "Checklist of Vascular Plants of Minnesota" obtained from the Minnesota DNR website at: http://files.dnr.state.mn.us/eco/plant_list9-25-02.pdf

MLCCS MODIFIERS

Several 'classes' of MLCCS modifiers were assessed in the field during the evaluation of the land cover classification of Bloomington. These modifiers were assessed based on the methodology and definitions provided in the MLCCS Users Manual. Once assessed, the modifier values were entered into the ArcGIS database for each landcover area.

Land Use Modifier

The M_2xx modifiers were developed to identify and describe cultural land use. Four categories of land use modifiers were applied during field checking which included: transportation, open space use, pavement (including trails), farmstead.

Current Vegetation Management

The M_30x modifiers were developed to describe current vegetation management and include categories that reflect management for wildlife use as well as planted communities.

Modifiers for Native Plant Community Quality Ranking

The natural plant community sites can be given a natural quality ranking, based on the DNR's Natural Heritage's Element Occurrence Ranking Guidelines (EOR). Non-native, altered and disturbed communities should only be given a non-native ranking (NN or NA). Valid codes and general definitions of M_34X modifiers from the MLCCS training manual are:

A = highest quality natural community, no disturbances and natural processes intact. Site must be visited entirely or partially to accurately assess its natural quality at this level (fld_level = 3 or 4).

B = good quality natural community. Has its natural processes intact, but shows signs of past human impacts. Low levels of exotics. Site must be visited entirely or partially to accurately assess its natural quality at this level (fld_level = 3 or 4).

C = moderate condition natural community with obvious past disturbance but is still clearly recognizable as a native community. Not dominated by weedy species in any layer.

Minimally, the site must be visited from the edge to accurately assess its natural quality at this level (fld_level = 2, 3 or 4).

D = poor condition of a natural community. Includes some natives, but is dominated by non-natives and/or is widely disturbed and altered. Herbaceous communities may be assessed with this ranking from a distance (fld_level = 1) if large masses of invasive species are present and the entire community is visible.

NA = Native species present in an altered / non-native plant community. This NA ranking can only be used if the site is field checked from the edge or to a greater degree (fld_level 2, 3, or 4), thus confirming the presence of native species within a non-native community.

NN = Altered / non-native plant community. These semi-natural communities do not qualify for natural quality ranking. Using NN signifies the site has been field checked and confirms it is a semi-natural community.

Invasive Species Modifiers

The M_4xx modifiers correspond to individual invasive plant species and their percent cover within a particular land cover area. Invasive species represent a potential threat to the ecological health of native plant communities and in some cases to the economic vitality of culturally dominated plant communities. Tracking their presence provides a valuable tool for focused management where it is most appropriate. For each land cover area, invasive species presence was noted and percent cover estimated. Cover classes (as viewed from above) and invasive species encountered in Bloomington are as follows:

Invasive Species Percent Cover Class Codes	
Cover Class	**Description**
0	Unknown, or if field checked, plants not observed
1	Observed, unknown quantity
2	1 to 5% Cover
3	6 to 25% Cover
4	26 to 50% Cover
5	51 to 75% Cover
6	76 to 100% Cover

Invasive Species Noted in Bloomington Surveys		
Species Code	**Common Name**	**Scientific Name**
402	Purple Loosestrife	*Lythrum salicaria*
406	Narrow-Leaf Cattail	*Typha angustifolia*
407	Crown Vetch	*Coronilla varia*
408	Common and Glossy Buckthorn	*Rhamnus cathartica* and *R. frangula*
409	Leafy Spurge	*Euphorbia esula*
412	Reed Canary Grass	*Phalaris arundinacea*
410	Tartarian Honeysuckle	*Lonicera tatarica*
411	Garlic Mustard	*Alliaria petiolata*
412	Reed Canary Grass	*Phalaris arundinacea*
413	Smooth Brome	*Bromus inermis*
414	Spotted Knapweed	*Centaurea maculosa*
415	Exotic Thistle	*Cirsium* and *Carduus* sp.
416	Siberian Elm	*Ulmus pumila*
417	Common Reed Grass	*Phagmites australis*
420	Black Locust	*Robinia pseudoacacia*

Water Modifiers

The M_7xx modifiers were developed to describe additional elements to water features. The M_72x modifiers denote built features, or human induced modifications, such as artificial substrates, diked / impounded, beaver ponds, excavated, farmed, ditched/partially drained, or spoils. The M_73x denote wetland features or uses such as livestock watering hole, reservoir, stormwater management, wildlife management. The M_74x modifiers denote stream features or modifications such as ditches. The M_75x modifiers denote spring features such as groundwater seepage.

Field-check Level

A field-check level modifier was assigned to all land cover areas. The field-check level indicates the degree to which an individual land cover area was checked in the field during the land cover assessment. All natural and semi-natural areas (except those inaccessible, i.e., surrounded by open water) were visited at least partially (i.e. field check levels 3, 4), while at a minimum, areas (20xxx and 10xxx codes) were viewed from the edge (field check level 2) or from a short distance (field check level 1). The following is a list of the Field Check Level modifiers used in the MLCCS code

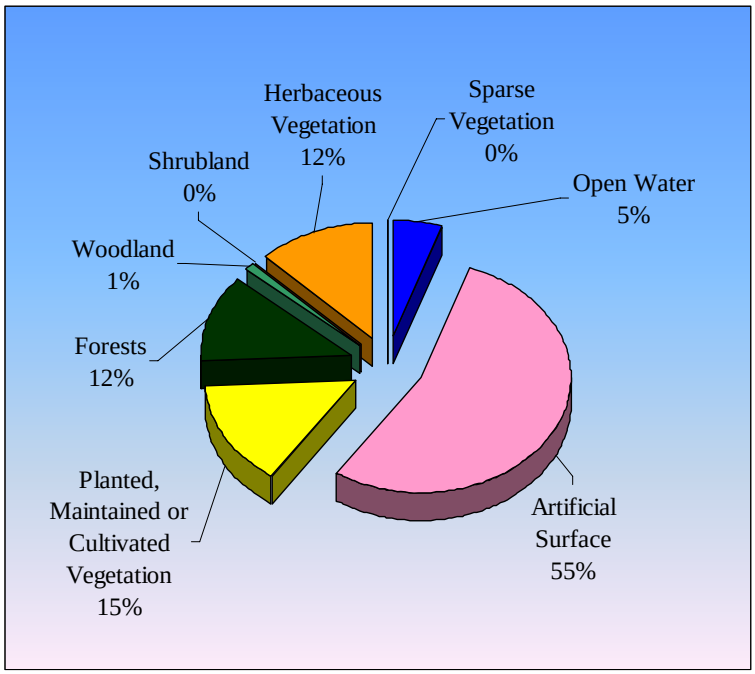
Field Check Level	Description
4	Visited Entirely
3	Visited Partially
2	Viewed From Edge
1	Viewed From a Distance
0	Not Checked

LAND COVER CLASSIFICATION RESULTS

All land cover areas were classified to the highest level allowed within the coding system with the majority of areas being coded to Level five. 108 unique land cover codes were used to describe 3,297 individual land cover areas. 69 landscape areas have a reported acreage of less than 0.2 acres and are mostly comprised of small portions of larger

polygons that were clipped at the city boundary or grass strips in roadways. Five natural areas of sufficient quality to be ranked are less than 0.2 acres in size. All of these areas are wetland communities, including Black Ash Seepage Swamp, Wet Meadows, and Wet Meadow Floating Mat Subtype.

The areas that are not a result of artificially clipping at the city boundary range from 0.05 acres (A Black Ash Seepage Swamp) to 495.96 acres (Water Lily Open Marsh) located in the Minnesota River valley.



Figures 6 and 7 depict the MLCCS land cover types for levels one and three for the City of Bloomington. Appendix A provides summary tables of the information represented in each figure with acreages and number of areas per land cover type at each respective classification level, as well as a summary table for level 5.

"Artificial surfaces and associated areas" comprise the most common cover type, in terms of area. This category (10xxx's) includes commercial and industrial complexes, buildings and pavement, and transitional / exposed earth cover types. The Artificial surfaces and associated areas cover type represents 55% of Bloomington, covering 13,274 acres. The "Planted or cultivated vegetation" category, which is also the other cultural land cover type, covered 15% totaling 3,637 acres. The Planted or cultivated vegetation category (20xxx's) includes residential and commercial maintained lawns, vegetated roadside areas, sports fields, golf courses, and cropland.

The natural and semi-natural (non-native dominated) land cover types include the "Forest (30xxx's), Woodland (40xxx's), Shrubland (50xxx's), Herbaceous (60xxx's), Non-

vascular vegetation (70xxx's), Sparse Vegetation (80xxx's) and Water (90xxx's)" categories and comprise the remaining 25% or 7629 acres. There were no land cover polygons classified in the Non-vascular category.

Forests constitute the second greatest area in the natural and semi-natural land cover type categories, covering 2,959 acres or 10.7%. 1,695 acres, or 57% of the 2,959 acres of Forest are classified as "Upland Deciduous Forest" while the remaining 43% is deciduous forest on hydric soils. Of the 57% (1,695 acres) of upland deciduous forest, 50% (847 acres) is classified as "Altered/non-native", 35% (598 acres) is "Oak forest mesic subtype", 14% (239 acres) is "Oak Forest, Dry Subtype" and <1% (10 acres) is "Maple-Basswood Forest" in a single isolated stand along Lower Nine Mile Creek. Of the 43% (1264 acres) of deciduous forests on hydric soils, 28% (358 Acres) are Floodplain Forest, 23% (285 acres) are Floodplain Forest Silver Maple Subtype, 10%(125 acres) are Lowland Hardwood Forest and 1.5%(19 acres) are Black Ash Swamp Seepage Subtype in small isolated locations at the base of the river bluffs. The remaining 38% (478 acres) are Altered/Non-native Forest on Hydric Soils.

"Woodlands" or open stands of trees with non-touching crowns contribute a small 1.1% (273 acres) respectively to the total land cover. 85% (232 acres) are Oak Woodland Brushland. Historically, the "Woodland" category would have been a much larger component of the community type, represented by Oak Woodland Brushland throughout the Bloomington uplands. Many of the communties listed as Oak Forest today contain the open grown oaks typical of Oak Woodlands, but at this time, most have completely closed canopies (far greater than 70%) and were placed into the Oak Forest categories. The remainder of the Woodland categories were dominated by Altered/Non-native communities.

"Shrublands" are a very small component of the Bloomington landcover contributing only 0.1% (49 acres) to the total area. Of these, 53% (25 acres) were classified as Wetland Willow Swamp or Wet Meadow communities. The remainder are classified as Altered Non-native communities.

The “Herbaceous” cover type is the largest largest category by area in the natural to semi-natural categories with 3,036 acres (12.4 %). The herbaceous category is a broad category capturing cover types ranging from grasslands of varying heights and degrees of tree cover, to various saturated and emergent vegetation communities found in wetlands and along channels, rivers, and lakeside. 6%(172 acres) of “Herbaceous” cover is upland grasslands. Of these, 39 acres are currently dominated by Native Species and are classified as Mesic or Dry Prairie, mostly in very small scattered patches. The “Herbaceous” category is primarily comprised of wetland communities with Native Dominated “Natural” communities comprising 30% (897 acres) of the total Herbaceous Cover, Not including the Water Lily Open Marsh which constitutes another 26% (802 acres) of the “Herbaceous” category cover. Most of this 56% Native cover is located along the Minnesota River valley in large floodplain, backwater swathes. 30% (903 acres) are Altered/Non Native wetland grassland type communities in the “Temporarily flooded, Saturated, Seasonally flooded, and Semi-permanently flooded altered/non-native dominated vegetation categories. 9% (261 acres) are Grasslands with sparse tree cover in both upland and lowland conditions.

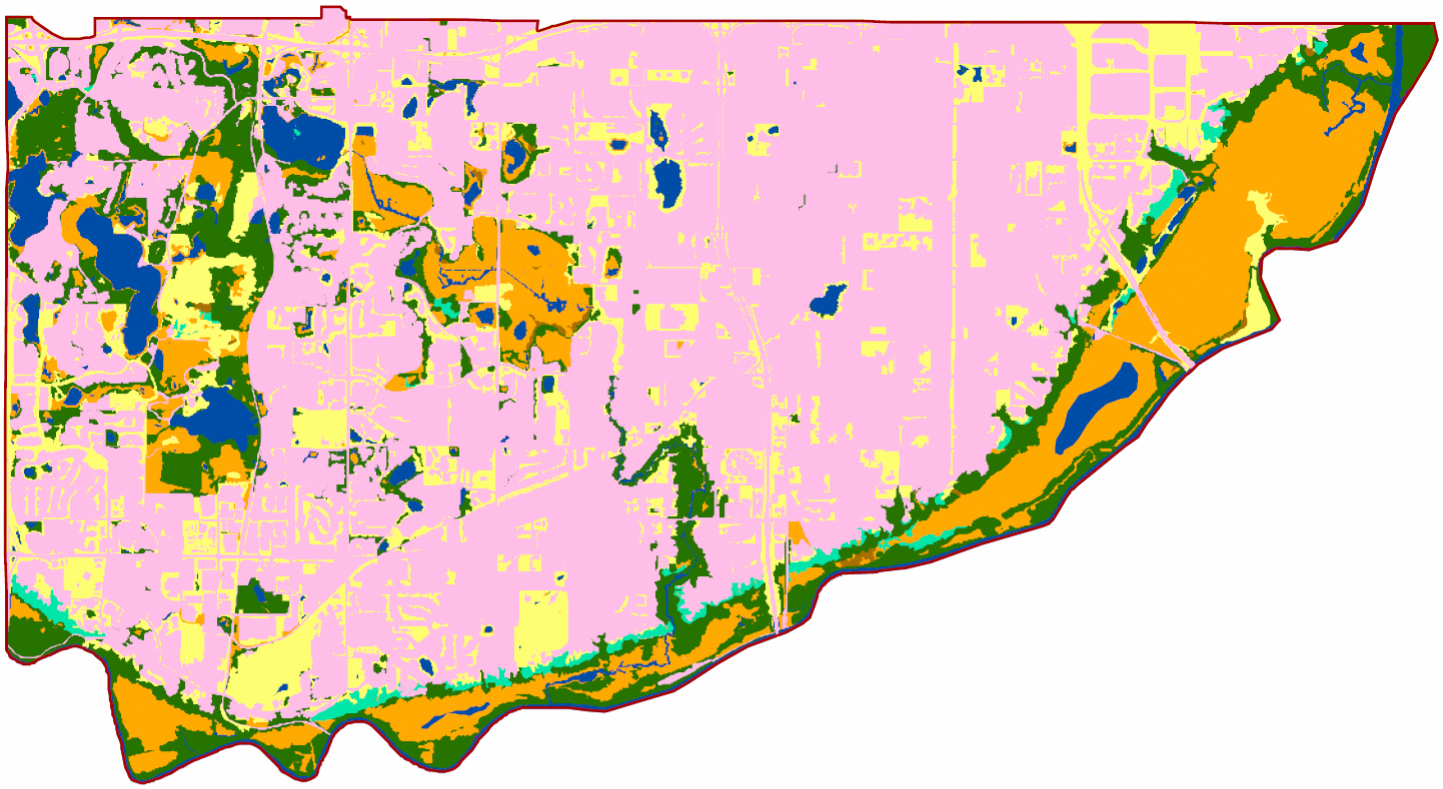
The “Sparse Vegetation” category comprises 0.04% (10 acres) and is located as beaches and mudflats within the Minnesota River valley.

“Water”, covers 5.3% or 1,304 acres with a mix of Limnetic, Littoral, Palustrine and Riverine cover. The Riverine portions comprised mostly by the portion of Bloomington located within the Minnesota River.

The following maps provide Level 1 (General) and Level 3 (Refined) representations of MLCCS findings. Note that nearly the entire east central and northeast portions of the city are dominated by Cultural landscapes associated with urban development. The Minnesota River valley represents by far the largest Natural and Seminatural area block in the City of Bloomington, with the Hyland Park and Nine Mile Creek Corridor providing a significant green extension through the city.

Land Cover Classification - Level 1

City of Bloomington Land Cover Classification and Natural Resources Inventory



Legend

City Boundary

Land Cover Classification - Level 1

- 10000 Artificial Surfaces and Associated Areas
- 20000 Planted or Cultivated Vegetation
- 30000 Forests
- 40000 Woodlands
- 50000 Shrublands
- 60000 Herbaceous
- 70000 Nonvascular Vegetation
- 80000 Sparse Vegetation
- 90000 Water

N

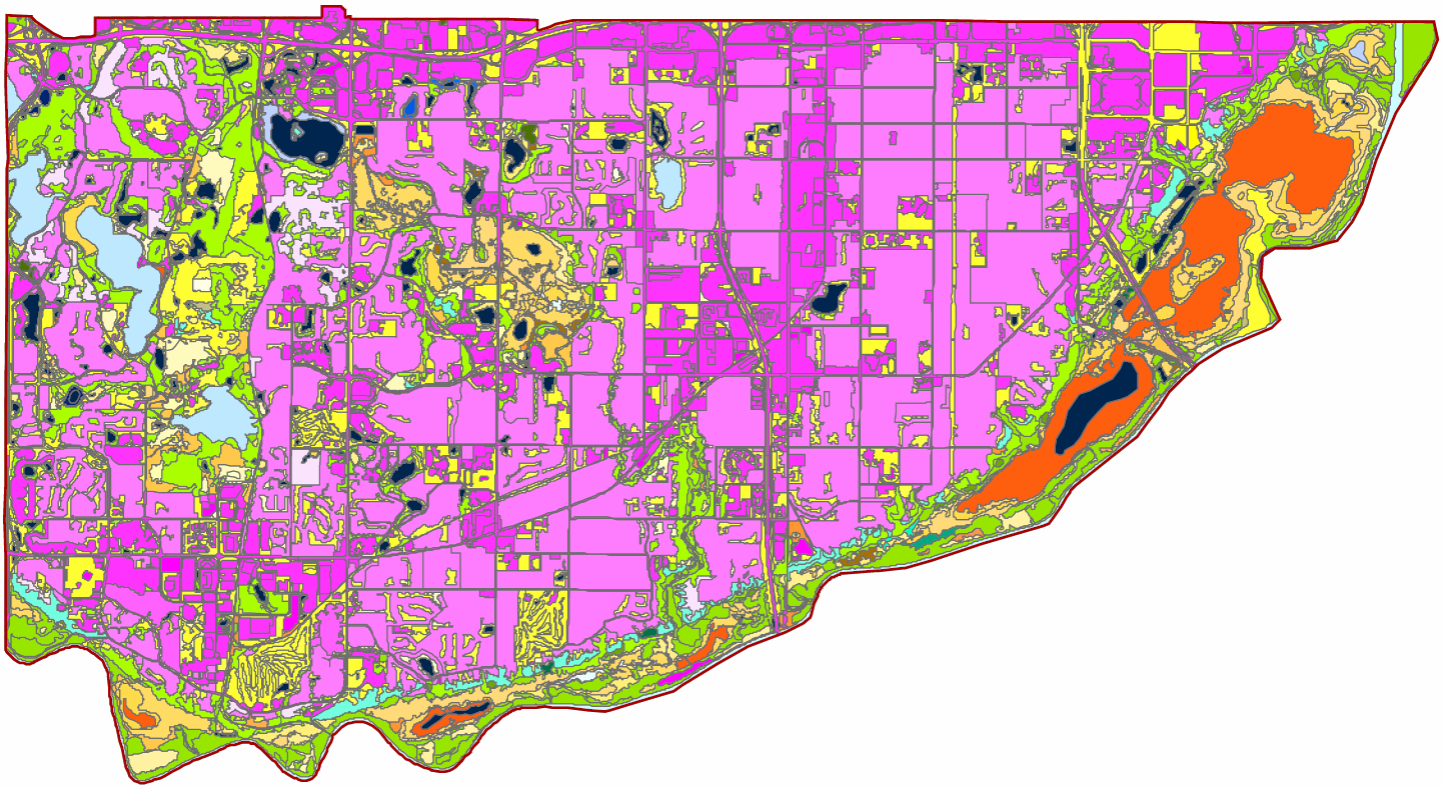
0 3,500 7,000 14,000 Feet

1 inch equals 7,000 feet

Figure 6

Land Cover Classification - Level 3

City of Bloomington Land Cover Classification and Natural Resources Inventory



Legend

- City Boundary
- *Color Categories for Level 3 Land Cover Classification

Level 1 Breakdown

- 10000 Artificial Surfaces and Associated Areas
- 20000 Planted or Cultivated Vegetation
- 30000 Forests
- 40000 Woodlands
- 50000 Shrublands
- 60000 Herbaceous
- 70000 Nonvascular Vegetation
- 80000 Sparse Vegetation
- 90000 Water

N

0 3,500 7,000 14,000 Feet

1 inch equals 7,000 feet

* Complete Level 3 Legend on next page.

Figure 7

Legend for Level 3 Land Cover Classification

10000 ARTIFICIAL SURFACES AND ASSOCIATED AREAS
- Artificial surfaces with coniferous trees
- Artificial surfaces with deciduous tree cover
- Artificial surfaces with mixed coniferous and deciduous tree cover
- Artificial surfaces with coniferous and/or deciduous shrubs
- Artificial surfaces with coniferous and/or deciduous shrubs with sparse trees
- Artificial surfaces with perennial grasses with sparse trees
- Artificial surfaces with perennial grasses
- Artificial surfaces with cultivated herbaceous vegetation (Gardens)
- Buildings and/or pavement
- Exposed earth

20000 PLANTED OR CULTIVATED VEGETATION
- Planted, maintained or cultivated coniferous trees
- Planted, maintained or cultivated deciduous trees
- Planted, maintained or cultivated mixed coniferous and deciduous trees
- Planted, maintained or cultivated coniferous shrubs
- Planted, maintained or cultivated deciduous shrub/vine vegetation
- Planted, maintained or cultivated mixed coniferous-deciduous shrub/vine vegetation
- Planted or maintained grasses with sparse tree cover
- Planted or maintained grasses
- Planted or maintained grasses and forbs
- Cultivated row cropland
- Close grown or solid seeded cropland

30000 FORESTS
- Upland coniferous forest
- Saturated coniferous forest
- Upland deciduous forest
- Temporarily flooded deciduous forest
- Saturated deciduous forest
- Seasonally flooded deciduous forest
- Upland mixed coniferous-deciduous forest

40000 WOODLANDS
- Upland coniferous woodland
- Upland deciduous woodland
- Temporarily flooded deciduous woodland
- Saturated deciduous woodland
- Seasonally flooded deciduous woodland
- Upland mixed coniferous-deciduous woodland

50000 SHRUBLANDS
- Saturated needle-leaved or microphyllous evergreen dwarf-shrubland
- Upland deciduous shrubland
- Temporarily flooded deciduous shrubland
- Saturated deciduous shrubland
- Seasonally flooded deciduous shrubland
- Semipermanently flooded deciduous shrubland

60000 HERBACEOUS
- Tall grassland
- Medium-tall grassland
- Temporarily flooded grassland
- Saturated graminoid vegetation
- Seasonally flooded emergent vegetation
- Semipermanently flooded emergent vegetation
- Intermittently exposed emergent vegetation
- Permanently flooded emergent vegetation
- Tall grassland with sparse deciduous trees
- Grassland with sparse conifer or mixed deciduous/coniferous trees
- Temporarily flooded grassland with sparse deciduous trees
- Saturated grassland with sparse deciduous trees
- Seasonally flooded grassland with sparse deciduous trees
- Upland forb vegetation
- Saturated forb vegetation
- Standing water hydromorphic rooted vegetation
- Seasonally flooded annual forb vegetation

70000 NONVASCULAR VEGETATION
- Lichen vegetation with sparse tree layer

80000 SPARSE VEGETATION
- Cliffs with sparse vegetation
- Level bedrock with sparse vegetation
- Lowland or submontane talus / scree slopes
- Cobble / gravel beaches and shores
- Sand flats
- Temporarily flooded sand flats
- Seasonally / temporarily flooded mud flats

90000 WATER
- Slow moving lenear open water habitat
- Fast moving linear open water habitat
- Limnetic open water
- Semipermanently flooded littoral aquatic bed
- Intermittently exposed littoral aquatic bed
- Permanently flooded littoral aquatic bed
- Littoral open water
- Intermittently exposed aquatic bed
- Permanently flooded aquatic bed
- Palustrine open water

Figure 7A

NATURAL RESOURCE INVENTORY RESULTS

Within the City of Bloomington, 368 individual natural communities were identified (not including water), representing a total of 3656 Acres. During the photo interpretation process, more than 1150 terrestrial natural and semi-natural areas were identified. Those landscape areas deemed in the field to be semi-natural ("disturbed/non-native") or cultural (below level 30XXX) were assigned an MLCCS code, but not given a Natural Area ranking. A total of 368 landscape areas were determined to meet the characteristics necessary to achieve natural community status. Each of the natural communities were field surveyed for species composition, ecological community characteristics and were given a Natural Community Quality Ranking. 26 distinct terrestrial (not including open water) natural community types were identified.

The following chart provides a breakdown of all terrestrial natural areas identified within the City of Bloomington.

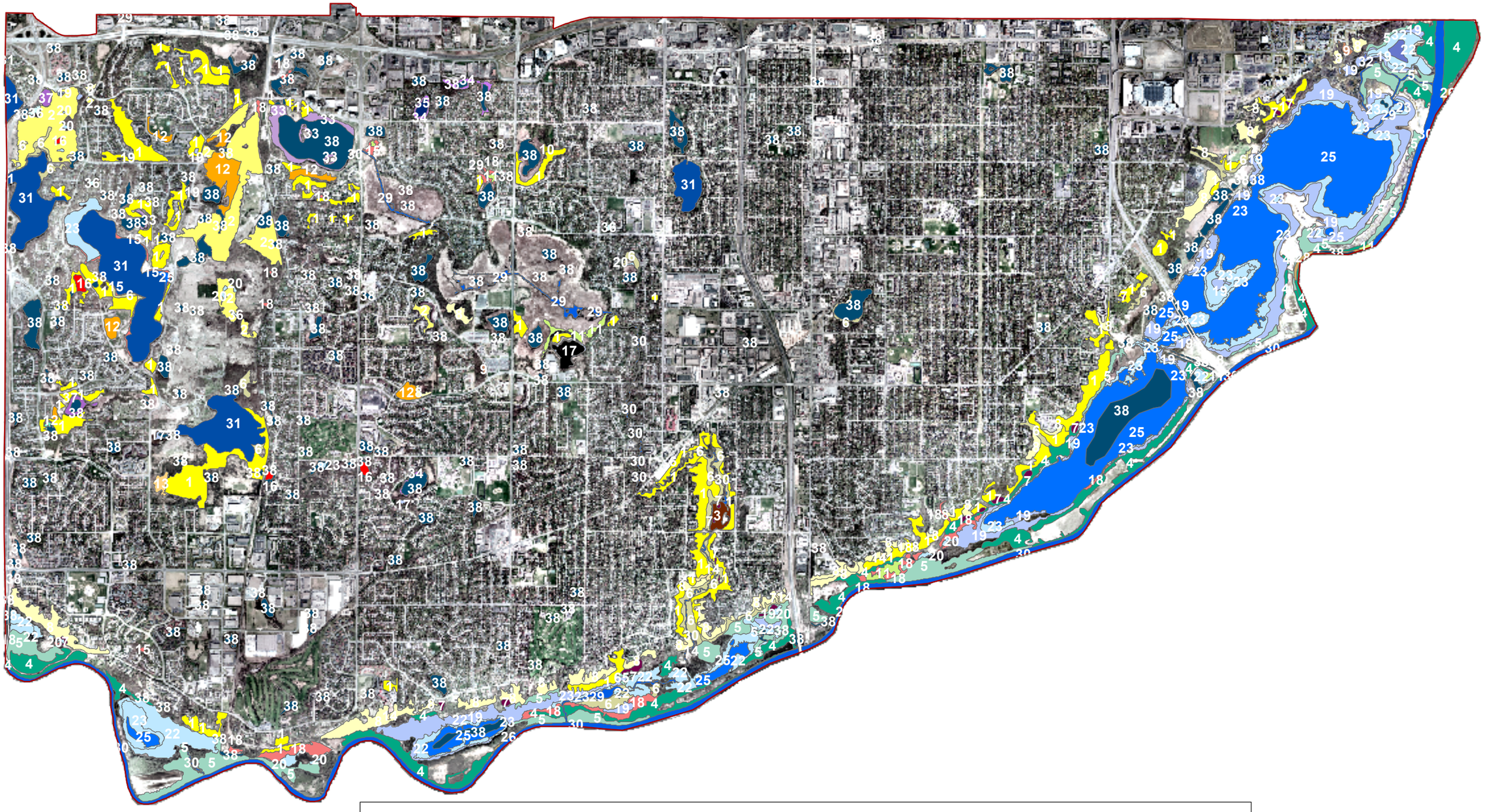
Community Description	Field Code	Ranked Natural Areas	Total Acres	Min. Size (Acres) - unique ID	Max. Size (Acres)
Oak forest mesic subtype	32112	72	597.82	0.51	66.40
Oak forest dry subtype	32113	8	239.34	1.02	102.78
Maple-basswood forest	32150	1	10.74	10.74	10.74
Floodplain forest	32210	30	358.23	2.88	53.78
Floodplain forest silver maple subtype	32211	24	285.14	0.90	44.08
Lowland hardwood forest	32220	22	124.91	2.08	13.68
Black ash swamp seepage subtype	32311	18	18.56	0.05	3.01
Oak woodland-brushland	42120	31	231.61	1.41	34.01
Wet meadow shrub subtype	52420	1	1.36	1.36	1.36
Willow swamp	52430	7	24.36	0.68	8.70
Mesic prairie	61110	7	68.18	1.83	33.06
Dry Prairie	61210	1	6.13	6.13	6.13
Dry prairie sand-gravel subtype	61213	9	5.39	0.22	1.06
Wet meadow	61420	6	13.55	0.13	5.26
Poor fen sedge subtype	61451	4	9.80	0.94	4.58
Mixed emergent marsh - seasonally flooded	61520	3	3.56	0.48	1.66
Wet meadow - seasonally flooded	61540	25	68.28	0.15	16.96
Mixed emergent marsh	61620	26	346.20	0.47	132.63
Wet meadow - semipermanently flooded	61640	13	14.10	0.12	4.46
Wet meadow floating mat subtype	61641	2	1.03	0.13	0.89

Community Description	Field Code	Ranked Natural Areas	Total Acres	Min. Size (Acres) - unique ID	Max. Size (Acres)
Mixed emergent marsh - intermittently exposed	61720	18	180.19	2.29	56.56
Mixed emergent marsh - permanently flooded	61820	27	260.25	1.03	166.83
Seepage meadow	63210	1	0.29	0.29	0.29
Water lily open marsh	64111	10	775.59	2.59	772.61
River mud flats	83312	1	5.70	5.70	5.70
Floating vascular vegetation	93220	1	5.65	5.65	5.65
TOTAL		368	3655.96		

Figure 8, on the next page is a map of all natural communities including water bodies identified within the City of Bloomington.

Natural Areas and Communitiy ID Numbers

City of Bloomington Land Cover Classification and Natural Resources Inventory



Hennepin County
Department of Environmental Services
Natural Resources Unit

0 1,750 3,500 7,000 10,500 Feet

1 inch equals 3,500 feet

Legend

- City Boundary

Natural Community Type

- 1 Oak forest mesic subtype
- 2 Oak forest dry subtype
- 3 Maple-basswood forest
- 4 Floodplain forest
- 5 Floodplain forest silver maple subtype
- 6 Lowland hardwood forest
- 7 Black ash swamp seepage subtype
- 8 Oak woodland-brushland
- 9 Native dominated disturbed upland shrubland
- 10 Wet meadow shrub subtype
- 11 Willow swamp
- 12 Mesic prairie
- 13 Dry Prairie
- 14 Dry prairie sand-gravel subtype
- 15 Wet meadow
- 16 Poor fen sedge subtype
- 17 Mixed emergent marsh - seasonally flooded
- 18 Wet meadow - seasonally flooded
- 19 Mixed emergent marsh
- 20 Wet meadow - semipermanently flooded
- 21 Wet meadow floating mat subtype
- 22 Mixed emergent marsh - intermittently exposed
- 23 Mixed emergent marsh - permanently flooded
- 24 Seepage meadow
- 25 Water lily open marsh
- 26 Cobble / gravel shore
- 27 Riverine sand flats - bars
- 28 River mud flats
- 29 Slow moving linear open water habitat
- 30 Fast moving linear open water habitat
- 31 Limnetic open water
- 32 Semipermanently flooded littoral aquatic bed
- 33 Floating vascular vegetation - semipermanently flooded littoral aquatic bed
- 34 Floating vascular vegetation - permanently flooded littoral aquatic bed
- 35 Littoral open water
- 36 Permanently flooded aquatic bed
- 37 Floating vascular vegetation
- 38 Palustrine open water

Figure 8

NATURAL COMMUNITY AREA DESCRIPTIONS

The following are descriptions of the land cover types found in Bloomington. Basic descriptions are excerpted from the MnDNR's MLCCS Manual (MnDNR 2004).

Deciduous forest – Deciduous tree species generally contribute >75% of the total tree cover.

Upland deciduous forest (MLCCS Code 32100) – Cold-deciduous forest (e.g., broadleaf forests of the Midwest). Mn DNR Natural Heritage description: Deciduous Forests occur primarily in the deciduous forest-woodland zone; they are less common in the prairie zone and the conifer-hardwood forest zone. On dry sites, the most common canopy dominants of Deciduous Forests are oak, aspen, and birch trees. Sugar maple, basswood, elm, and ash trees are common dominants on moist sites. Pines, especially white pine, sometimes form a minor part of the forest canopy. Where the forest canopy is broken or interrupted (typically in oak-dominated forests) there is usually a dense layer of tall shrubs, including hazelnuts, dogwoods, prickly ashes, and cherries. Beneath the denser canopies formed by mesic tree species such as sugar maple, the shrub layer is sparse or absent. The canopy tree species of Deciduous Forests occur in combinations determined primarily by environmental features (including soil texture, parent material, presence of hardpans and firebreaks, depth to the water table, topography, aspect, and local climate) that affect soil moisture and the local fire regime. These features produce a gradient of Deciduous Forest types from dry, fire-prone forests composed of fire-adapted species, to mesic forests composed of fire sensitive species. Many of the dry Deciduous Forests in the deciduous forest-woodland and prairie zones appear to have succeeded from deciduous brushland and savanna in the past 100 to 125 years following widespread forest fragmentation and fire suppression. Mesic Deciduous Forests in these zones occur in areas protected from fire, especially areas of rough topography and along bodies of water. In the conifer-hardwood forest zone, mesic Deciduous Forests occur on sites with impeded drainage (having impermeable banding or textural pans in the soils) and in areas of locally high precipitation or humidity, such as along the shore of Lake Superior. The dry deciduous forests of the conifer-hardwood zone, especially Aspen, Aspen-Birch, and Paper Birch forests, occur on fire-prone sites and are considered early successional communities.

Oak forest mesic subtype (MLCCS Code 32112 / 72 occurrences, 597.9 Acres)– An upland deciduous forest with >30% oaks, but NOT cases where open grown oaks cover 10-70% and are surrounded by younger trees, or where oaks are <60% and sugar maples, basswoods, and yellow birches comprise all the rest.
Mn DNR Natural Heritage description: Northern red oaks, white oaks, or bur oaks dominate the more mesic stands of Oak Forest. These stands occur on sites that had fewer severe fires before European settlement than the sites on which dry Mixed Oak Forest occurs. These mesic stands most likely were always forest, rather than woodland or savanna. They have

tall (> 20 meters), straight, single-stemmed trees that lack spreading lower branches. Commonly, mesic fire sensitive tree species are present with the oaks in these stands, especially in the understudy. These species include basswood, green ash, butternut hickory, big-toothed aspen, and butternut. The shrub layer in mesic stands is sparser than in dry stands and, correspondingly, the orb layer is denser and more diverse and there are more graminoid species. Like the drier stands, however, there is little oak regeneration, and most mesic Oak Forests appear to be succeeding to Maple-Basswood forest. Heavy selective logging of the oaks in mesic stands may accelerate this trend, producing young stands of Maple-Basswood Forest. The mesic stands often grade into drier stands of Maple-Basswood Forest, but differ from them by having a somewhat denser shrub layer and the herbs woodrush (*Luzula acuminata*) and pointed-leaved tick-trefoil (*Desmodium glutinosum*) in their understory. Natural stands of mesic Mixed Oak Forest are rare. Drier stands are more common, in part because relative to the mesic forests they occur on sites with soils less suitable for cultivation.

Oak Forest with straight grown trunks of mostly red oak. Heavy shrub layer is typical of the edge condition where this photograph was taken.

Oak forest dry subtype (MLCCS Code 32113 / 8 occurences, 239.4 Acres) – An upland deciduous forest dominated by northern pin oaks and white oaks, with black oaks, shagbark hickories and sometimes bur oaks important in southeastern Minnesota. These stands occur on nutrient-poor, well-drained sandy soils on outwash plains, river terraces, and beach ridges. Due to open canopy, the shrub layer is often very dense.
Commonly, at least some of the oak trees in dry oak forest stands have multiple stems and thick, spreading lower branches, indicating that these trees grew up in a disturbed and more open setting. Minnesota public land survey records indicate, in fact, that many of these dry stands were oak savanna or oak woodland before European settlement and with fire suppression have succeeded to forest.

In many cases, in Bloomington, the distinction between Dry Oak forest and Oak Woodland Brushland (MLCCS Code 42120) is difficult. The determination was made to place these areas into the forest category when the canopy was a mix of both age classes and of a continuous nature.

Maple-basswood forest (MLCCS Code 32150 / 1 occurrence, 10.8 Acres) – An upland deciduous forest where sugar maples, basswoods, and elms dominate the canopy or where they dominate along with oaks (with <60% oak cover). Conifers trees and club mosses are absent, yellow birches are rare, and spring ephemerals are common. Mn DNR Natural Heritage description: Maple-Basswood Forest is a mesic community of the deciduous forest-

woodland zone, especially the portion from southeastern to west-central Minnesota. It also occurs occasionally in the conifer-hardwood forest zone and as isolated stands in the prairie zone on sites well protected from fire. The tree canopy of Maple-Basswood Forests is dominated mostly by basswoods, sugar maples, and (formerly) American elms. Other mesic trees, such as slippery elms, northern red oaks, bur oaks, white ashes, and green ashes, are sometimes dominant locally. The canopy is very dense, with tall, straight, relatively narrow-crowned trees. The understory is multi-layered and patchy. It is composed of saplings and seedlings of the canopy species (especially sugar maple), along with American hornbill, ironwood, butternut hickory, pagoda dogwood, and leathered. Because the tree canopy permits so little light to reach the forest floor during the summer, Maple-Basswood Forests have a suite of orb species that bloom, produce seeds, and die back in May and early June before tree leaves are fully developed. These species–the spring ephemerals and the winter annuals–include spring beauties (*Clayton* spa.), Dutchman's breeches (*Dicentra cucullaria*), trout-lilies (*Erythronium* spa.), and cleavers (*Galium aparine*). Other herbs, such as the sedge *Carex pedunculata*, bottlebrush grass (*Hystrix patula*), and bearded short-husk (*Brachyelytrum erectum*), are commonly present in the groundlayer but usually not abundant. Maple-Basswood Forest occurs only on protected sites, where catastrophic forest crown fires were rare historically. Across most of its range, the community develops most commonly on well-drained loamy soils that lack mottling or other evidence of water-table levels within the tree-rooting zone. In north-central Minnesota, Maple-Basswood Forests develop on soils with fine-textured subsurface layers that slow the downward movement of water and nutrients. Maple-Basswood Forest is a late-successional community, tending to succeed Mixed Oak Forest (and other forest types) on mesic sites. It is self-perpetuating in the absence of catastrophic disturbance and climate change because the dominant tree species readily reproduce by gap phase replacement. The very shade-tolerant sugar maple seedlings and saplings, especially, may exist in a suppressed state in the understory for many years until the death of a mature tree when one or a few grow rapidly into the canopy gap. Maple-Basswood Forests often develop into old growth forests, because catastrophic disturbances are rare in the community and because the dominant tree species are long-lived (> 250 years). The trend in most stands of Maple-Basswood Forest is toward greater dominance by sugar maple. Maple-Basswood Forest grades into Oak Forest where the frequency of fire increases in the landscape. It grades into Lowland Hardwood Forest in low areas where elms and ashes become more abundant and where the water table is at least seasonally within the tree rooting zone. Conifers are absent or uncommon in most of the range of Maple-Basswood Forest, but grow with sugar maple, basswood, and other mesic species in northeastern and southeastern Minnesota. The mixed stands in northeastern Minnesota are classified as Northern Hardwood Forest. In southeastern Minnesota they are classified as White-Pine Hardwood forest. Undisturbed stands of Maple-Basswood Forest are rare. The soils on which the forest grows are suitable for cultivation so much of the community has been cleared for cropland. Remaining stands have often been grazed or selectively cut for lumber or fuel wood. Heavy grazing causes compaction of the soils and the almost complete destruction of the understory, resulting in even-aged woodlots with large mature trees in the canopy, little reproduction, and few native shrubs and herbs. Selective logging of the less shade-tolerant species (northern red oak, white oak, bitternut hickory, and walnut) has been common since European settlement, and has hastened dominance by sugar maple and basswood in many stands. The composition of the

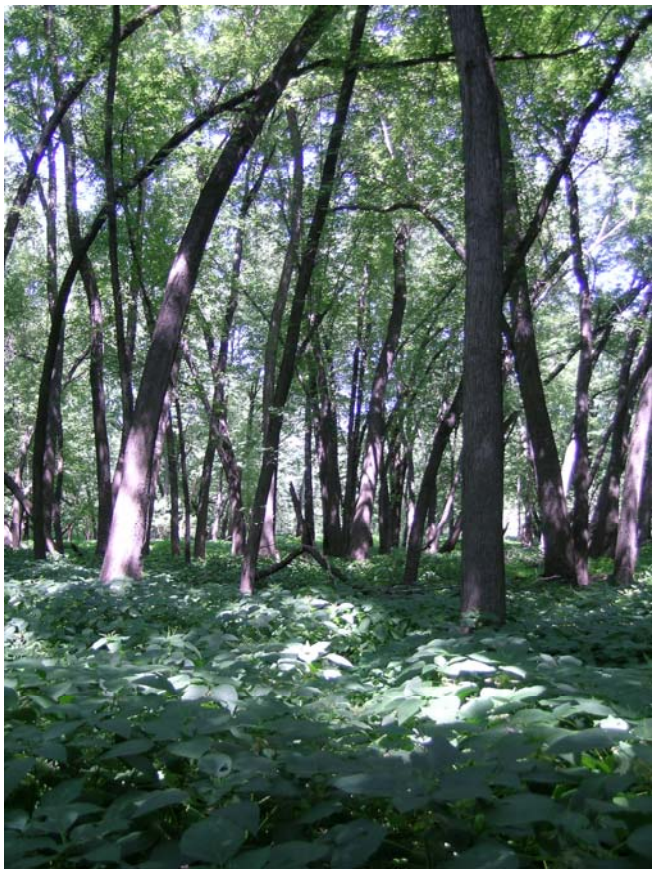
community has also been altered throughout its range by Dutch elm disease, which has killed most of the mature elm trees, and in many stands by the loss of interior groundlayer species following forest fragmentation. Common buckthorn and Tartarian honeysuckle sometimes invade stands of Maple-Basswood Forest, but rarely attain the high densities they may have in Oak Forest. Maple-sugaring is one human activity associated with Maple-Basswood forests that appears to have little impact on the structure and composition of the community, as some of the best remaining tracts of Maple-Basswood Forest have long histories of maple sugar production.

There was one example of Maple Basswood Forest located in Bloomington. The area was likely formerly Mesic Oak Forest located within the Nine Mile Creek Corridor. This stand was likely logged for oak timber in the past with Sugar Maple regeneration nearly completely dominant today. Very few stands with Sugar Maple dominance were noted in the Bloomington survey, however, with the presence of Sugar Maple and Basswood in Mesic Oak Forests, and in the absence of fire, the potential for the Maple Basswood forest type to increase in the coming decades exists.

Temporarily flooded deciduous forest (MLCCS Code 32200) - Temporarily flooded cold-deciduous forest (e.g., alluvial bottomland hardwoods). Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of the temporarily flooded regime.

Floodplain Forest (MLCCS Code 32210 / 25 occurrences, 357.2 acres) – Vegetation with >30% tree cover that is subject to occasional floodplain inundations and is dominated by some combination of silver maple, cottonwood, black willow, American elm, slippery elm, boxelder, bur oak, and swamp white oak.
Mn DNR Natural Heritage description: Seasonally wet forest community that occurs on active floodplains of major rivers and their tributary streams. The canopy is dominated by deciduous tree species tolerant of inundation, abrasion, and other disturbances associated with flooding. The canopy is variable in composition, either composed of a mixture of tree species or strongly dominated by a single tree species. The tree canopy cover is highly variable within Floodplain Forests. The canopy is continuous in some stands while other stands have open areas caused by repeated erosion, ice scouring, and soil and debris deposition, all of which prevent the growth of trees and shrubs. Areas beneath tree-canopy openings in the forests are either dominated by short-lived herbaceous plants or, hwere erosion and disturbance from flooding tend to be repeated and sever, remain unvegetated.

Floodplain Forest Silver Maple Subtype (MLCCS Code 32211 / 24 occurrences, 285.3 acres) - The Silver Maple Subtype occurs mainly in the decidous forest-woodland zone along the Minnesota, lower Mississippi, and St. Croix Rivers and their tributaries. This subtype is best developed in broad, deep glacial meltwater-cut river valleys that have been filling with coarse alluvium ever since the glacial meltwaters subsided. As the name implies, silver maples dominate the tree canopy in this subtype and are present in the subcanopy and shrub layer as well. Green Ashes, Cottonwoods, and American Elms are often present in the canopy, but are most common as seedlings and saplings. The understory is open with less than 25% cover by tree seedlings and saplings. Herbs in the nettle family, including wood nettle (*Laportea canadensis)* and clearweed (*Pilea pumila*), dominate the groundlayer. Woody and herbaceous climbers are common, especially wild grape (*Vitis riparia*), wild cucumber (*Sicyos angulatus*), groundnut (*Apios americana*), and hog-peanut (*Amphicarpa bracteata*).



Silver Maple dominated Floodplain Forest in the Minnesota River Valley floodplain. Note near complete groundlayer dominance by Wood Nettle.

Lowland hardwood forest (MLCCS Code 32220 / 22 occurrences, 124.9 Acres) - A forest with >30% tree cover that is dominated by trees typical of mesic uplands, floodplains, or wetlands (but not aspens or balsam poplars) and is growing just above an active floodplain, in an inactive floodplain, or at the upper edge of wetland basin. The forest is comprised of more than 2 tree species and includes diverse understory vegetation.
Mn DNR Natural Heritage description: Lowland Hardwood Forest is a wet-mesic forest that is present throughout Minnesota. It is transitional between the terrestrial and palustrine systems, occurring on sites with seasonally high water tables (within the tree-rooting zone) but that do not flood regularly and that have mineral rather than peat soils. In accord with the poorly drained sites on which the Lowland Hardwood Forests occur, species tolerant of periodic soil saturation dominate the tree canopy. American elms and black ashes are common canopy dominants, but most stands are mixed, with slippery elms, rock elms, basswoods, bur oaks, hackberries, yellow birches, green ashes, black ashes, quaking aspens, balsam poplars, and paper birches as important species. The tall-shrub layer is usually discontinuous and is composed of a mixture of upland and lowland shrubs. The ground layer is composed mostly of upland herbs that do not root to the water-table.

Lowland Hardwood Forest usually occurs in fire-protected areas, although even in unprotected areas the community burns infrequently because the woody vegetation is usually hydrated, especially in the spring. Lowland Hardwood Forest soils differ from Hardwood Swamp Forest soils by being mineral rather than peaty and from the mineral soils of other mesic upland forest types by being seasonally saturated (at depths greater than 0.5 meters).

Lowland Hardwood Forest is often composed of late-successional species, but few stands in Minnesota have old canopy trees, presumably because of windthrow and infrequent episodes of killing floods. Lowland Hardwood Forest is topographically transitional between upland forests and forested peatlands and is best developed on flat terrain where such transition zones are broad (e.g., on river terraces above normal flood levels, on loamy ground moraine, and on drumlin fields).

Currently, there are no recognized subtypes or sections of Lowland Hardwood Forest. Following further field review, stands of Lowland Hardwood Forest may be reclassified as wet subtypes of Aspen-Birch or Aspen Forest, or dry subtypes of Hardwood Swamp Forest.

Saturated deciduous forest (MLCCS Code 32300) - Surface water is seldom present, but substrate is saturated to surface for extended periods during the growing season. Mn DNR Natural Heritage description: Hardwood Swamp Forests are minerotrophic wetland communities that occur on muck and shallow peat substrates on wet sites in the deciduous forest-woodland and conifer-hardwood forest zones. They have tree canopies dominated by broadleaved deciduous species, including black ash, paper birch, yellow birch, red maple, American elm, slippery elm, green ash, quaking aspen, or, rarely, balsam poplar. Tamarack is sometimes the most abundant tree species present in a stand, but never forms more than 50% of the total tree cover (if so, the swamp is classified as a Tamarack Swamp). White pines or white cedars also occur in the community on occasion. The tree canopy cover ranges from dense (especially in even-aged or drained stands) to sparse, but there is always at least 30% cover by trees over 5 meters tall.

Hardwood Swamp Forests form fairly distinct, often narrow zones at the margins of wetland basins or along streams. They form more extensive stands in shallow, poorly drained depressions or lake basins and in groundwater seepage areas on level terrain at the bases of hills or terrace slopes. Hardwood Swamp Forests often are long-lived communities on nutrient-rich low-disturbance sites. Flooding (especially that caused by beaver dams) and windthrow occasionally kill canopy trees in Hardwood Swamp Forests, causing regression to Shrub Swamps or Wet Meadows. It is usually difficult to identify boundaries between Hardwood Swamp Forests and Shrub Swamps where the two community classes intergrade or form complex patches. Hardwood Swamp Forests also grade into Tamarack Swamp. (Tamaracks tend to dominate Swamp Forests where the organic substrate is poorer in nutrients, thicker, less decomposed, more acidic, or more continuously saturated.)

Hardwood Swamp Forests differ from Floodplain Forests and from Lowland Hardwood Forests by having an organic substrate and continuously or nearly continuously saturated

soils during normal years. They also differ from Lowland Hardwood Forests by lacking upland herbs in the groundlayer. Hardwood Swamp Forests and Floodplain Forests may be difficult to separate where low-gradient streams flow across flat lowlands as, for example, along the Rum River on the Anoka Sand Plain in Isanti County.

Black Ash Swamp Seepage Subtype (MLCCS Code 32311/ 18 occurrences, 18.6 Acres) – A forest with saturated hydrology and >30% tree cover, of which >50% is black ash.

Skunk Cabbage in bloom in early spring is often the dominant groundlayer species in a Black Ash Seepage Swamp. This is a common community mix at the base of Bloomington bluffs.

Mn DNR Natural Heritage description (Black Ash Swamp)**:** Black Ash Swamps are dominated by black ash trees, which occur either in almost pure stands or in mixed stands with other hardwoods. Common canopy associates include green ashes, paper birches, yellow birches, red maples, and (rarely) bur oaks.

Mn DNR Natural Heritage description (Black Ash Swamp Seepage Subtype): In Washington and Chisago counties, very local, small stands of Black Ash Swamp occur in seepage zones at the bases of river terrace slopes: these stands are classified as Seepage Subtypes of Black Ash Swamp. Skunk Cabbage (*Symplocarpus foetidus*) and dense tussocks of the fine-bladed sedge, *Carex bromoides* are characteristic in seepage Black Ash Swamps, and the subtype also provides habitat for two rare species, bog bluegrass (*Poa paludigena*) and water-pennywort (*Hydrocotyle americana*). Black Ash Swamp and Mixed Hardwood Swamp are often closely associated and difficult to separate from oneanother in these seepage zones.

In Bloominton, every intance of Black Ash Swamp was located at a seep at the base of the bluff of the Minnesota River with nearly continuous Black Ash Canopy and Skunk Cabbage present or dominating the ground layer. Though geographically not described as located within this zone (Hennepin County), the community description for the Black Ash Seepage Swamp fits the areas identified along the base of the Minnesota River bluff. The average size of the polygons identified is one acre.

Upland Deciduous Woodland (MLCCS Code 42100) – Communities of the decidous forest-woodland zone, composed primarily of oak or aspen trees and brush, characterized by scattered trees set in a matrix of brush with widely scattered prairie openings.

Oak Woodland-Brushland (MLCCS Code 42120 / 31 occurrences, 255.4 acres) – Upland vegetation with 10-70% tree cover, oaks comprising >30%, and herbaceous species

comprising <30% of non-tree cover. Forests with open grown oaks surroiunded by hounger trees are also included in this community.

Mn DNR Natural Heritage description: This community occurs on dry to mesic sites throughout the deciduous forest-woodland zone and is structurally intermediate between between Oak Savanna and Oak Forest.

Typical Oak Woodland Brushland where open grown oaks persist amongst a mix of younger trees and shrubs. Many of these communities are overgrown with invasive buckthorn or, in the absence of fire, tree canopies are closing and are transitioning into Oak Forest.

The principle species in the tree canopy are bur oak, northern pin oak, white oak and northern red oak. Aspens may form up to 70% of the tree canopy cover. The brush layer ranges in density from sparse (with 10-30% cover), to and inpenetrable thicket. It is often especially dense in openings between clumps or groves of trees. Most of the floristic diversity in the commuinity exists in the brush layer, which most commonly is composed of blackberries, raspberries, gooseberries, dogwoods, cherries, hazelnuts, prickly ashes, and sprouts, of oak and quaking aspen. Prairie vegetation, if present occurs only in small openings in the tree or shrub canopy. It is usually composed of woodland species capable of surviving in the dense shade beneath the brush layer.

Oak Woodland-Brushland is a fire-maintained community. It is most common on rich sites where trees and shrubs grow well but where recurrent fires prevent the formation of true forest. Historically, Oak Woodland-Brushland was probably one of the most extensive community types in Minnesota, comprising much of the vegetation described as oak barrens, brushland, and thickets by the early surveyors. The fires that maintained Oak Woodland-Brushland usually started on nearby prairies. Following the coversion of the prairies to agricultural land, Oak Woodland-Brushland is defined broadly enough here to include also communities which the predominant tree cover is oak brush or oak-aspen brush (that originated following fire or limited human disturbance) instead of a well-developed tree canopy. There are four geographic sections of Oak Woodland-Brushland in Minnesota.

In the Big Woods Section, woodland dominated by white oak is present in areas with coarse-textured soils, such as on kames or eskers, or in areas prone to occasional fires. Natural woodland are now extremely rare in this section because of logging, grazing, and fire suppression.

This community type in Bloomington is typified by open grown mature oaks surrounded by matix of either young oaks, or more often a thicket of invasive Common Buckthorn. The MLCCS code allows for forests with open grown oaks surrounded by younger trees to be included in this community. For the purposes of MLCCS mapping in Bloomington, ecologists determined the distinction between Woodland and Forest to be a closed canopy community with younger trees forming a significant portion of canopy composition. Many of the sites mapped as Oak Forest (32112 and 32113) were dominated by open grown oaks typical of Savanna growth, but in the absence of fire, many of these sites have tipped from Savanna to Woodland, and now to Forest.

Deciduous Shrubland (MLCCS Code 52000)- Shrubs are NOT dominated by conifers or evergreens, including broad-leaved dwarf-shrubs

Seasonally flooded deciduous shrubland (MLCCS Code 52400)– Surface water is present for extended periods during the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is very variable, extending from saturated to a water table well below the ground surface. Includes Cowardin's Seasonal, Seasonal-Saturated, and Seasonal-Well Drained modifiers. Mn DNR Natural Heritage description: Shrub Swamps are minerotrophic, tall-shrub communities, most often present on mucks and shallow peat in the deciduous forest-woodland and conifer-hardwood forest zones. The major shrub species in these communities are speckled alder, willows (especially pussy willow, slender willow, and Bebb's willow), and red-osier dogwood. The shrub canopy ranges from interrupted, with many light gaps, to closed, with the ground well shaded below. Graminoid-dominated openings, if present, are not distinctly separated from shrub clumps. Poison sumac or alder buckthorn often dominate the canopy in disturbed swamps in east-central Minnesota. Shrub Swamps are considered mid-successional communities, between Wet Meadow/Fen communities and Conifer or Hardwood Swamp

A typical Willow swamp located adjacent to a wet meadow dominated by Tussock Sedge. Often, the shade of willow and other shrub species provide a buffer from encroaching invavise Reed Canary Grass.

Forests. However, Shrub Swamp communities are relatively stable in areas where water table fluctuations are small, as the loss or gain of woody vegetation in many wetland areas is linked to particularly dry or wet cycles that affect seedling establishment, flooding, windthrow, and fire frequency. Before European settlement, extensive areas of Shrub Swamp existed in shallow wetlands on outwash plains and in glacial lake basins. Where fires occurred relatively frequently in wetland areas, the wetland communities probably were open, mainly lacking shrubs or trees. Occasional fires or prolonged flooding (such as from beaver ponds) in Conifer Swamp or Hardwood Swamp may have been important in maintaining patches of Shrub Swamp in areas that are predominantly swamp forest. Artificially drained meadows or fens rapidly succeed to shrubby Wet Meadow or Fen, to Shrub Swamp, or to forested swamps.

Wet meadow, shrub subtype – seasonally flooded (MLCCS Code 52420/ 1 occurrences, 1.4 Acres) – A wetland with 50-70% cover by tall shrubs (not dominated by bog birch (*Betula pumila*), meadowsweet (*Spiraea alba*), or steeplebush (*Spiraea tomentosa*)) where peat is <0.5m deep and gaps are NOT dominated by emergents >1m tall. The leaves of most grasses and sedges (such as *Calamagrostis canadensis*, *Carex lacustris*, and *C. stricta*, NOT prairie species) are >3mm wide.

Willow Swamp – seasonally flooded (MLCCS Code 52430/ 8 occurrences, 25.2 Acres)– Vegetation on seasonally flooded soils with <30% tree cover and >50% cover by tall shrubs, where <50% of the shrubs are alders and gaps are dominated by emergents >1m tall. Mn DNR Natural Heritage description: Willow Swamp is a minerotrophic wetland with a canopy of medium to tall (>1m) shrubs dominated by willows (especially pussy willow, slender willow, and Bebb's willow) and red-osier dogwood. Other shrubs, such as speckled alder, bog birch, poison sumac, and alder buckthorn, may be common in the tall shrub layer, although speckled alder is never the most abundant species present. Herbaceous species (especially graminoids) characteristic of Wet Meadow/Fen communities are common in the more open occurrences of the community. However, in Willow Swamps, unlike Wet Meadow/Fen communities, these graminoid-dominated patches are poorly separated from clumps of shrubs. The most common herbs are tussock sedge (*Carex stricta*), prairie sedge (*Carex prairea*), lake-bank sedge (*Carex lacustris*), broad-leaved cattail (*Typha latifolia*), blue-joint (*Calamagrostis canadensis*), northern marsh fern (*Thelypteris palustris*), and jewel-weed (*Impatiens capensis*). Willow Swamps dominated by bog birch are closely related to the Shrub Subtype of Rich Fen but have more minerotrophic indicator species [such as *Alnus rugosa, Ilex verticillata, Impatiens capensis,* and *Lycopus uniflorus*] than are present in Rich Fens. Following fire in Conifer Swamps or in the Shrub Subtype of Rich Fens there may be initially a dense cover of willows (usually balsam willow and bog willow), but these stands are best classified as successional stages of Conifer Swamp or Rich Fen rather than as Willow Swamp. The dense groves of sand-bar willow or juvenile black willow that occur on sand bars along rivers are not considered Shrub Swamp communities but instead River Beach communities, as they occur on mineral rather than peat or muck substrates.

Grasslands or emergent vegetation (perennial graminoid vegetation) (MLCCS Code 61000)– Perennial graminoid vegetation (grasslands). Perennial graminoids generally

contribute to greater than 50% of total herbaceous canopy cover when the other cover types present (e.g. tree, shrub, dwarf-shrub, nonvascular) is less than 25% and herbaceous cover exceeds the cover types.

Tall Grassland (MLCCS Code 61100) – Mature grass species 1 meter or higher.

Mesic Prairie (MLCCS Code 61110 / 8 occurrances, 74.3 acres) – Upland grassland dominated by prairie species, with <10% tree cover and <50% shrub cover, and NOT growing on steep slopes or on sand- or gravel-dominated soil.

Mn DNR Natural Heritage description: This is a type of Upland Prairie which occurs primarily in the prairie zone, with scattered occurrences in the deciduous forest-woodland zone. It is dominated by grasses. The tall grasses, big bluestem (*Andropogon gerardii*) and Indian Grass (*Sorghastrum nutans*), are the major dominants on moist sites. Forbs tyically are abundant (but subdominant to the grasses) and may have high local diversity. Forb secies composition varies with site moisture, although some forb species occur on almost all sites, moist or dry. Several low shrub or sub-shrub species are common on Upland Prairie: the most characteristic is leadplant *(Amorpha canescens).* Taller brush and trees are absent or scattered, however brush or woodland areas may be interspersed with prairie, usually in association with topgraphic and aquatic features that provide protection from fire.

The most important cause of variation in species composition in prairie communities is variation in soil moisture. The local soil moisture regime is determined by slope, aspect, proximity to the water table, and soil texture. Regionally, variation in species composition is primarily caused by climatic variation.

Upland Prairies occur on a range of landforms in the prairie zone, from nearly flat glacial lakeplains to steep morainic slopes. In the deciduous forest-woodland zone, prairies occur on droughtly, level outwash areas and steep south-and west-facing slopes. The pre-European settlement distribution of prairie was related to the interaction of local fire frequency with growth rates of woody species: where conditions were favorable for rapid growth, more frequent fires were necessary to maintain prairie over savanna, woodland, or forest. Fragmentaiton of Upland Prairie since European settlement has reduced fire frequency throughout the prairie and deciduous forest-woodland zones, and most prairie remnants have more brush and trees than were present in the past.

Mesic Prairie is a dry-mesic to wet-mesic grassland that occurs mainly in the prairie zone in southern and western Minnesota and sporadically in the deciduous forest-woodland zone. Mesic Prairie is dominated by grasses. Big bluestem (*Andropogon gerardii*), Indian Grass (*Sorghastrum nutans*) and Prairie Dropseed (*Sporobolus heterolepis*) are the major native species on most sites, with little bluestem (*Schizachyrium scoparium*) and porcupine grass (*Stipa spartea*) important on drier sites, and switchgrass (*Panicum virgatum*) and prairie cordgrass (*Spartina pectinata*) common on wetter sites. The introduced grass Kentucky Bluegrass (*Poa pratensis)* is present at most sites: its is a function of the site's disturbance history.

Forbs are abundant (but usually subdominant to grasses) and have high local diversity. Forb species-composition also varies locally with soils moisture. There is greater regional variation among forbs than among grasses.

Mesic Prairie is a fire-dependent community. In the absence of fire, occurrences of Mesic Prairie are invaeded by brush and trees. Within the deciduous forest-woodland zone, Mesic Prairie usually occurs on level outwash areas or on broad, sandy river terraces.
The soils in Mesic Prairie are predominantly mollisols with thick, dark mineral surface layers that have high base saturation and dominantly bivalent cations. They range in texture and drainage from silty and somewhat poorly drained to sandy and somewhat excessively drained, with moderately well-drained, loamy soils being most common. Mesic Prairie grades into Wet Prairie on moister sites and to the Hill and Sand-Gravel subtypes of Dry Prairie on drier sites.

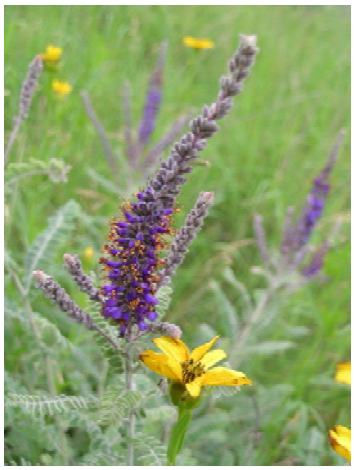
In Bloomington, Mesic Prairies exist as either restorations, now dominated by Mesic Prairie species, or remnants maintained most often by planned, controlled burning.

Dry Prairie (MLCCS Code 61210 / 1 occurances, 6.1 acres) -
Upland grassland dominated by prairie species, with <10% tree cover and <50% shrub cover, where the substrate is composed of sand or gravel (sometimes with a thin organic surface layer), or any texture on steep slopes. (Some examples may occur on sandy soils in temporarily flooded areas.)

Dry prairie exists throughout Bloomington in openings. Dry Prairie in Bloomington persists on sand and gravel soils and requires periodic disturbance (fire or mowing) to limit encroachment by woody species. This diverse prairie, located within the Hyland Park Preserve is maintained by controlled burns and active removal of invasive species.

Dry Prairie Sand-Gravel Subtype (MLCCS Code 61213 / 9 occurances, 5.4 acres) -
Upland grassland dominated by prairie species, with <10% tree cover and <50% shrub cover, where the substrate is composed of sand or gravel (sometimes with a thin organic surface layer), or any texture on steep slopes. (Some examples may occur on sandy soils in temporarily flooded areas.)
Mn DNR Natural Heritage description: The Sand-Gravel Subtype occurs on gently to steeply sloping sites throughout the prairie zone, with scattered occurrences in the deciduous fores-woodland zone. Important species in the Sand-Gravel Subtype include needle grass (*Stipa comata*), plains muhly (*Muhlenbergia cuspidata*), prairie dropseed (*Sporobolus heterolepis*), Wilcox'x panic grass (*Panicum wilcoxianum*), blue grama (*Bouteloua gracilis*), hairy grama (*Bouteloua hirsuta*), and sand reedgarass (*Calamovilfa longifolia*).

Occurrences are typically small, corresponding to the local extent of these landforms. Soils are mollisols ("prairie soils"), but the organic-rich surface horizon is thinner than in Mesic Prairie, and fine to coarse gravel constitutes a significant fraction of the solum. Soil texture is most commonly sandy-skeletal, often with abundant larger stones as well as gravel. These soils are excessively dreained or somewhat excessively drained. This subtype grades into the Barrens Subtype on outwash deposits, or even into the dry-mesic phase of Mesic Prairie. Distinguishing between the Sand-Gravel Subtype when it is present on steeply sloping collapsed outwash or ice-contact deposits and the Hill Subtype may be expecially difficult. The Sand-Gravel Subtype occurs in the Southeast, Southwest, Central, and Northwest Sections of Dry Prairie.



Typical species of dry prairie include Leadplant, Prairie Coreopsis and White Prairie Clover, pictured here.

Saturated graminoid vegetation (MLCCS Code 61400) - Surface water is seldom present, but substrate is saturated to surface for extended periods during the growing season.

Wet meadow – saturated soils (MLCCS Code 61420/ 6 Occurrences, 13.5 Acres) - A wetland on saturated soils where peat is <0.5m deep and the leaves of most grasses and sedges (such as *Calamagrostis canadensis*, *Carex lacustris*, and *C. stricta*, NOT prairie species) are >3mm wide. There is <50% cover by tall shrubs, no sphagnum moss, and no groundwater discharge. See description of "wet meadow – temporarily flooded soils". Mn DNR Natural Heritage description: Wet Meadow is present throughout Minnesota. The

A wet meadow dominated by tall, wide bladed sedge species. Typical of Bloomington near the Minnesota River valley, *Phragmites australis* (the tall grass at left) is encroaching into and taking over this wet basin.

groundlayer of the community is composed of dense, closed stands of predominately wideleaved sedges (e.g., *Carex lacustris, C. stricta, C. aquatilis C. rostrata, C. haydenii*) or grasses (e.g., *Calamagrostis canadensis, C. inexpansa*). On saturated soils *C. stricta* is more common, while on seasonally flooded soils *C. lacustris* is more common. Orb cover and diversity usually are high. Forbs such as spotted joe-pye weed (*Eupatorium maculatum*), common mint (*Mentha arvensis*), turtlehead (*Chelone glabra*), and swamp milkweed (*Asclepias incarnata*) are conspicuous. Shrub cover in Wet Meadows ranges from 0 to 70% and is composed of Bebb's willows and pussy willows. Mosses are rare or absent.

Turtlehead (Chelone glabra) is typical of Wet Meadows

Wet Meadow occurs on wet mineral soil, muck, or shallow peat (<0.5 m). Standing water (generally stagnant) is present in the spring and after heavy rains, but the water table is generally below the soil surface for most of the growing season. The drawdown of the water table as the growing season progresses enables the oxidation of dead organic matter that has accumulated on the ground surface from previous years. This process makes available nutrients for some of the nutrient-demanding species present in the community. Occurrences of Wet Meadow along stream courses or adjacent to lakes often have fairly constant water levels relative to Wet Meadows in depressions or basins. On these sites siltation may be important in maintaining high nutrient levels. Wet Meadow tends to succeed to Shrub Swamp communities in the absence of fire. Water-table lowering caused by drought or by ditching promotes succession of Wet Meadow to Shrub Swamps. Wet Meadows on organic soils, like other communities that occur on organic soils, recover very slowly, if at all, once altered by artificial flooding or draining. There is one subtype, a Shrub Subtype.

Poor Fens have a ground layer dominated by Sphagnum moss and in Bloomington, all are located in small isolated basins.

Poor Fen Sedge Subtype (MLCCS Code 61450 / 4 occurrence, 9.8 acres)

A saturated wetland on peat>0.5m deep where grasses and sedges, such as *Carex lasiocarpa*, and *C. chordorrhiza*, are mostly <3mm wide and there is 0% cover by shrubs, including dwarf-shrubs. The community does not occur on the floating mat at the edge of a shallow lake

and lacks the complex patterened topography of strings and flarks. The following species are NOT common: *Carex livida, C. buxbaumii, Pedicularis lanceolata, Eleocharis compressa, Muhlengerbia glomerata,* and *Lobelia kalmii.*
NVCS description of a more narrowly defined community (CEGL002265): This graminoid poor fen commun ity is found in the Great Lakes region of the United States and Canada, as well as elsewhere in central Canada. Stands are found in peatlands with low exposure to mineral-rich groundwater, including basin fens, shores above the level of seasonal flooding and larger peatlands. Water hydrology is saturated, and surface water is slightly acidid and nutrient poor. The vegetation is dominated by graminoides, with up to 25 percent shrub cover, and scattered trees. The dominant graminoid is *Carex lasiocarpa,* and typical associates include *Carex chordorrhiza, Carex limosa, Carex oligosperma, Rhynchospora alba, Scirpus cespitosus,* and *Scheuchzeria palustris.* Forbs include *Arethusa bulbosa, Aster borealis, Calopogon tuberosus, Pogonia ophioglossoides, Sarracenia purpurea, Solidago uliginosa.* The low-shrub layer contains *Andromeda polofolia, Betula pumila, Chamaedaphne calyculata, Larix laricina, Salix discolor, Salix pedicellaris* and *Vaccinium oxycoccos.* The moss layer is virtually continous, and is dominated by *Sphagnum capillifolium, Sphagnum fuscum,* and *Sphagnum magellanicum.* Diagnostic features include the dominance of graminoides, particularaly *Carex lasiocarpa,* the almost continuous layer of *Sphagnum* peat, and few minerotrphic indicators.

Typically dominated by sedge species and Sphagnum Mosses, a variety of Orchids (*Pogonia ophioglossoides* pictured at left) and Large Cranberry (*Vaccinium macrocarpon),* above, are found in Fen communities in Bloomington.

Seasonally flooded emergent vegetation (MLCCS Code 61500)- Surface water is present for extended periods during the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is very variable, extending from saturated to a water table well below the ground surface. Includes Cowardin's Seasonal, Seasonal-Saturated, and Seasonal-Well Drained modifiers.

Mixed emergent marsh – seasonally flooded (MLCCS Code 61520/ 3 Occurrences, 3.6 Acres)– A wetland on seasonally flooded soils with <30% tree cover and <50% shrub cover that is NOT dominated by cattails, non-native species, or native graminoids <1m tall. Mn DNR Natural Heritage description: Mixed emergent marsh is dominated by wetland species other than cattails. Bulrushes are the most common dominants, especially hard-stemmed bulrush (*Scirpus acutus*), river bulrush (*Scirpus fluviatilis*), softstem bulrush (*Scirpus validis*), *Scirpus americanus*, and *Scirpus heterochaetus*. Common reed grass (*Phragmites australis*), spike rushes (*Eleocharis* spa.), and (in some river backwaters) prairie cordgrass

(*Spartina pectinata*) are less common dominants. In general, Mixed Emergent Marsh tends to occur on harder pond, lake, or river bottoms than Cattail Marsh and is less likely to contain the forbs that grow on the floating peat mats present in many cattail marshes. Broad-leaved arrowhead (*Sagittaria latifolia*)and aquatic macrophytes are the most common non-graminoid associates. Many Mixed Emergent Marsh species are sensitive to fertilizer run-off and other artificial disturbances, and disturbed Mixed Emergent Marshes (especially in the Prairie Zone) tend to convert to Cattail Marshes or become strongly dominated by reed canary grass (*Phalaris arundinacea*) or common reed grass (*Phragmites australis*), species that increase in abundance with disturbance. Mixed Emergent Marsh is a broad community type, encompassing all marshes dominated by species other than cattails. Therefore, subtyping or recognition of new marsh types is likely following more thorough inventories of these marshes. New divisions most likely will be made according to dominant species or basin types (e.g., lacustrine versus riverine), or both. There are two geographic sections, a Forest Section and a Prairie Section. The dominant species in the Prairie Section tend to have a Great Plains distribution while those in the Forest Section tend to have a Great Lakes distribution.

Mixed Emergent Marsh located in an oxbow lake in Minnesota River Floodplain. Typically, this oxbow would have standing water through the growing season. 2006 dry conditions allowed for drawdown and rapid growth of floodplain grasses (Rice Cut Grass) on exposed mud. Giant Bur Reed (left)

Wet meadow – seasonally flooded (MLCCS Code 61540/ 24 Occurrences, 68.3 Acres)– A wetland on seasonally flooded soils with <30% tree cover and <50% shrub cover that is NOT dominated by cattails, non-native species, or native graminoids >1m tall.
See Description for MLCCS Code 61420 - above

Semipermanently flooded emergent vegetation (MLCCS Code 61600) – Surface water persists throughout the growing season in most years. Land surface is normally saturated when water level drops below soil surface. Includes Cowardin's Intermittently Exposed and Semipermanently Flooded modifiers.

Mixed emergent marsh – semipermanently flooded (MLCCS Code 61620/ 26 Occurrences, 346.2 Acres)– A wetland on semipermanently flooded soils with <30% tree cover and <50% shrub cover that is NOT dominated by cattails or non-native species. See "mixed emergent marsh – seasonally flooded" for description.
See Description for MLCCS Code 61520 - above

Wet meadow – semipermanently flooded (MLCCS Code 61640/ 13 Occurrences, 14.1 Acres)– A wetland on semipermanently flooded soils with <50% shrub cover that is not dominated by cattails, non-native species, or native graminoids >1m tall. The leaves of most grasses and sedges are >3mm wide. Dominant species often include *Calamagrostis canadensis* and *Carex lacustris*.
See Description for MLCCS Code 61420 - above

Wet Meadow, floating mat subtype (MLCCS Code 61641/ 2 Occurrences, 1 Acre)– A floating wetland in a semipermanently flooded basin that is not dominated by cattails, non-native species, or native graminoids >1m tall. The leaves of most grasses and sedges are >3mm wide, but some narrow-leaved species are also present.
See Description for MLCCS Code 61420 - above

Intermittently exposed emergent vegetation (MLCCS Code 61700)– Surface water is present throughout the
year except in years of extreme drought.

Mixed emergent marsh – intermittently exposed (MLCCS Code 61720/ 18 Occurrence, 180.2 Acres) – A wetland on intermittently exposed soils with <30% tree cover and <50% shrub cover that is NOT dominated by cattails or non-native species. See Description for MLCCS Code 61520 - above

Permanently flooded emergent vegetation (MLCCS Code 61800) – Water covers the land surface at all times of the year in all years.

Mixed emergent marsh – permanently flooded (MLCCS Code 61820/ 27 Occurrences, 260.2 Acres) – A wetland on permanently flooded soils with <30% tree cover and <50% shrub cover that is NOT dominated by cattails or non-native species. See "mixed emergent marsh – seasonally flooded" for description. See Description for MLCCS Code 61520 – above

Seepage Meadow (MLCCS Code 63210, 1 Occurrence, 0.3 Acres) – A wetland on saturated soils where peat is <0.5m deep and the leaves of most grasses and sedges (such as *Calamagrostis Canadensis, Carex lacustris,* and *C. strict,* NOT prairie species) are >3mm wide. There is <50% cover by tall shrubs and no sphagnum moss. Groundwater is discharged from springs, often forming rivulets.
Mn DNR Natural Heritage description**:** Seepage Meadow probably occurs throughout Minnesota, but is best documented in the St. Croix valley. Skunk cabbage (*Symplocarups foetidus*) and angelica (*Angelica atropurpurea*) are the dominant plants and are indicative of the community. Graminoid cover is generally low: broad-leaved sedges (*Carex lacustris, C.*

stricta, *C. stipata*, and *C. comosa*) are the most common graminoid species. Northern marsh fern (*Thelypteris palustris*) and jewel-weed (*Impatiens capensis*) are common cover-forming species. Seepage Meadows develop around spring heads and in broader areas of groundwater discharge, most commonly in deep glacial meltwater-cut river valleys, at the bases of slopes separating stream terraces. The upwelling groundwater is cold and flows year-round. Peat is present in some seepage areas, sometimes in layers greater than one meter thick. Other seepage areas have little organic material, with the groundwater welling up through carbonate encrusted gravel.

Hydromorphic rooted vegetation (MLCCS Code 64000) – Non-emergent graminoids, or forbs structurally supported by water and rooted in substrate**.**

Water Lily Open Marsh (MLCCS Code 64111/ 10 Occurrences, 802.36 Acres) – Standing water with >25% cover by rooted species that either float or are submerged, most of which are water lilies. NVCS description: This rooted aquatic or open marsh community occupies shallow water depressions, oxbow ponds, backwater sloughs of river floodplains, slow moving streams, ponds, and small lakes throughout the central and eastern United States, extending from Maine to Ontario and Minnesota, south to Oklahoma and east to Georgia. It is dominated by rooted, floating-leaved aquatic species, with both submergent and emergent aquatics also present. *Nuphar lutea Ssp. Advena* and *Nymphaea odorata* are dominants. Other species present may include *Brasenia schreberi*, various *Potamogeton spa., Polygonum amphibium*, and *Polygonum coccineum*. Submerged aquatics that are more common in the southern part of the range include *Cabomba caroliniana*, *Ceratophyllum demersum*, and *Heteranthera dubia*.

Area of Water Lily Open Marsh that, during the very dry 2006 growing season, was drawn down sufficiently to expose mudflats for a few weeks. Typically this community is in standing water throughout the growing season.

Slow moving linear open water habitat (MLCCS Code 91100/ 8 Occurrences, 41.9 Acres) – Open water with <25% vegetative cover in an undammed channel where the gradient is low, the water velocity is slow, dissolved oxygen concentration is low, and the substrate is NOT comprised mostly of rock, cobble, or gravel with occasional patches of sand. The Cowardin classification system calls this a lower perennial riverine system. The gradient is low and water velocity is slow. The substrate consists mainly of mud and sand. Oxygen deficits may sometimes occur, the fauna is composed mostly of species that reach

their maximum abundance in still water, and true planktonic organisms are common. The gradient is lower than that of the Upper Perennial System and the floodplain is well developed.

Fast Moving Linear Open Water Habitat (MLCCS Code 91200, 14 Occurrences, 282.2 Acres)

Limnetic Open Water (MLCCS Code 92100/ 6 Occurrences, 358.2 Acres)) – Open water with <25% vegetative cover NOT in a channel (or in a channel where flow is not visible due to damming). The water covers >8 hectares (20 acres) OR water depth is >2 meters (6.6 feet) in the deepest part of the basin at times of low water.

Semipermanently flooded littoral aquatic bed (MLCCS Code 92200) - Surface water persists throughout the growing season in most years. Land surface is normally saturated when water level drops below soil surface. Includes Cowardin's Intermittently Exposed and Semipermanently Flooded modifiers.

Floating vascular vegetation – semipermanently flooded littoral aquatic bed (MLCCS Code 92220/ 2 Occurrence, 7.3 Acres) – Semipermanently flooded open water with >25% vegetative cover (mostly non-rooted vascular) in a basin (or in a channel where flow is not visible due to damming) >8 hectares (20 acres) where water depth is <2 meters (6.6 feet) at times of low water.

Permanently flooded aquatic bed (MLCCS Code 93200/ 4 Occurrences, 4.17 Acres)– Water covers the land surface at all times of the year in all years. Equivalent to Cowardin's 'permanently flooded.'

Floating vascular vegetation (MLCCS Code 93200 / 2 Occurrences, 10.4 Acres) – Permanently flooded open water with >25% vegetative cover (mostly nonrooted vascular) in a basin (or in a channel where flow is not visible due to damming) <8 hectares (20 acres) where water depth is <2 meters (6.6 feet) at times of low water.

Palustrine Open water (MLCCS Code 93300/ 191 Occurrences, 553.3 Acres)– Open water with <25% vegetative cover NOT in a channel (or in a channel where flow is not visible due to damming). The water covers <8 hectares (20 acres) AND water depth is <2 meters (6.6 feet) in the deepest part of the basin at times of low water.

RECOMMENDATIONS

CONCEPTUAL NATURAL RESOURCES/OPEN SPACE CORRIDORS

For this report, natural resources/open space areas are defined as "privately or publicly owned corridors of open space which often follow natural land or water features and which are primarily managed to protect and enhance natural resources". Open space corridors can and often do incorporate active or passive recreational trails, active recreational spaces (such as athletic fields or golf courses), and other public open spaces that may provide rudimentary ecological functions and values.

As a part of this project, the staff at Hennepin County Environmental Services identified a series of Natural Resources/Open Space Corridors shown as **Figure 9** on the following page. These corridors were identified primarily with the following guiding elements, listed in rough order of priority:

- Natural Community Quality – Moderate to High Quality Vegetative Communities
- Other unique and/or ecologically significant areas
- • Natural corridors with natural/semi-natural areas (e.g. lakes, streams, wetland complexes, drainage ways, floodplains, steep slopes)
- Connectivity to surrounding communities identified natural resources/open space corridors and trail systems
- Large publicly and privately owned protected open spaces
- Semi-natural areas that occur immediately adjacent to natural areas
- Areas that would serve as logical links between natural areas, particularly those that have potential for restoration to native vegetation

The natural resources/open space corridors shown in **Figure 9** are based on the above criteria. It should also be noted that due to urbanization, there are existing barriers that will need to be addressed to allow connectivity in some cases. The city is encouraged to consider forming an Open Spaces Committee that includes city staff, council members, parks and recreation commissioners, planning commission members, citizens of Bloomington and other important stakeholders to undertake a more comprehensive process of defining, locatingand protecting potential open space corridors. Such a process will allow for public input and technical guidance from experienced staff in the natural resources field, ensuring long term acceptance of a final product.

Based on the analysis provided in **Figure 9**, there are three major contiguous blocks of land in Bloomington where Natural and Semi-natural areas are linked. In each case, these blocks of land are largely publicly owned though private lands are located within or adjacent to these three blocks. The major locations are:

1. **The Minnesota River –** The lands along the Minnesota River valley are predominantly in public ownership either as a part of the National Wildlife Refuge or The River Valley Park. This area contains most of Bloomington's large Floodplain associated wetlands, Black Ash Seeps and backs up to both publicly owned and privately owned Oak Woodland Brushland as well as scattered dry prairies at the top edge of the river bluffs.

   The Minnesota River valley contains some of the largest contiguous blocks of moderate to high quality plant communities in the region and,under public ownership, there is a strong commitment to preservation of this natural resource. The Bloomington side of the river is fortunate to have minimal access points for automobile traffic and has largely been abandoned for the purposes of active resource use (logging and farming). In contrast, the Burnsville (south) side of the river is heavily used for barge, storage and shipping purposes. Within the Minnesota Valley Wildlife Refuge, portions of the area have been protected, and closed to the public for the purposes of wildlife refuge. There are within the refuge, large areas dominated by non-native wetland species, particularly smooth brome on higher elevations and reed canary grass in lower portions. Refuge managers and Bloomington Park managers should note the growing presence of invasive *Phragmites australis* located in wet areas throughout the park. Likewise, common buckthorn, invading from upland yards all over Bloomington has a very

Image shows the character of the south side (opposite bank) of the Minnesota River. This stretch of the Minnesota River is a working landscape, though with controls and partnerships, the quality natural areas can be preserved and strengthened.

strong presence along the forested bluff communities where the migrating bird flyway provides ample bird seed spreading opportunity for this species.

2. **Nine Mile Creek –** Outside of the Miinesota River valley, Nine Mile Creek provides the longest continous natural corridor link through the City of Bloomington. The Creek is divided into three very different portions based on the analysis in **Figure 9** (not including the portion within the Minnesota River Floodplain). The Lower Creek from the Minnesota River Bottoms up to Moir Park is protected within a deep gorge and a nice mix of forested, woodland and herbaceous communities from top to bottom of slope. The portion just upstream from Moir Park has very little Natural Community integrity beyond the banks of the stream. Landcover mapping indicated that most private landowners are performing active conventional suburban yard maintenance nearly to the stream bank with some exceptions. This portion of the stream is largely inaccessible to the public in the form of recreational uses, and land management is largely up to individual landowners. North of 94th Street the creek meanders across Bloomington through broad wetland valleys and lakes, mostly in public ownership.

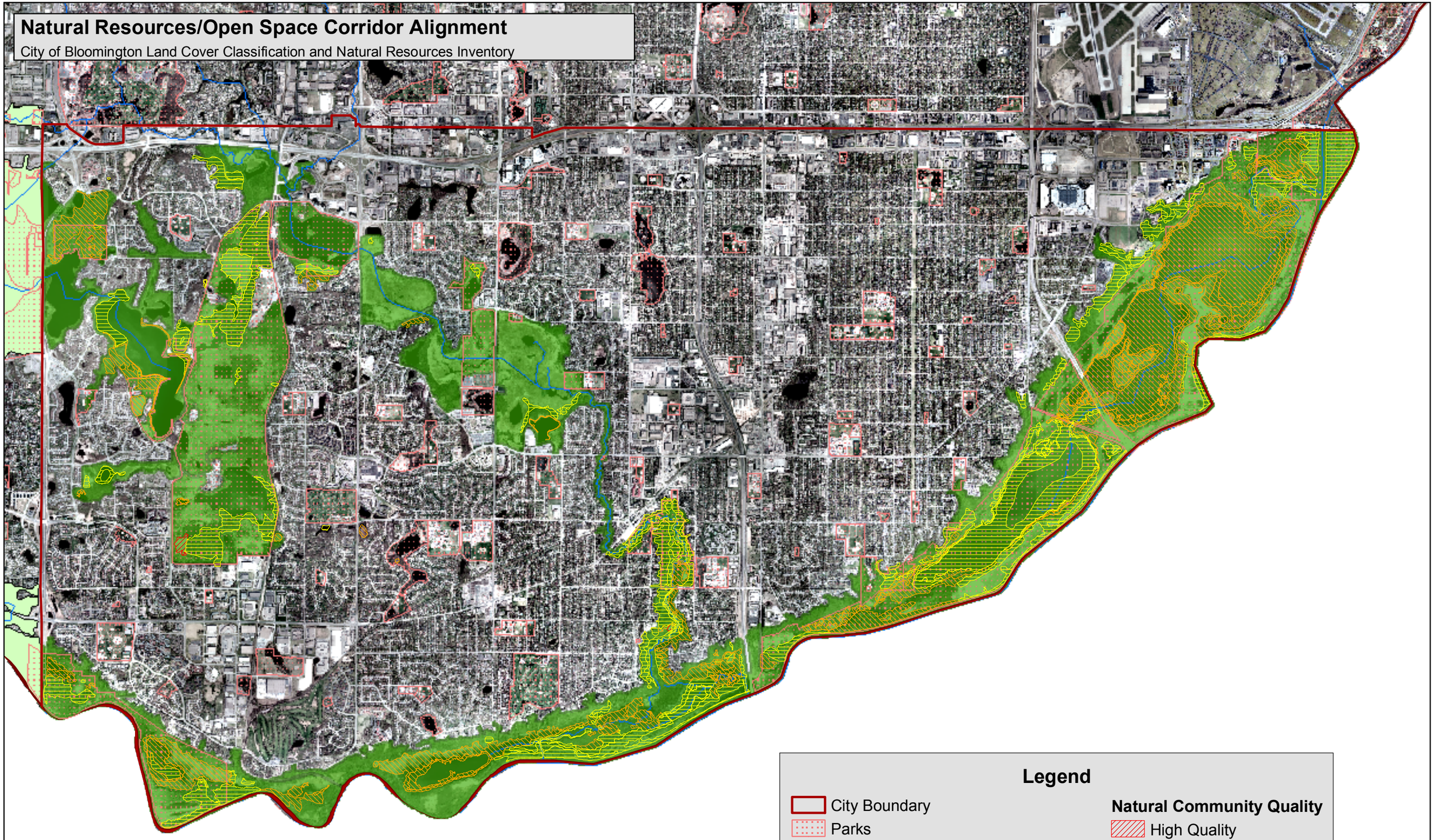
   The distinct areas of Nine Mile Creek should be treated individually based on ecological and landuse characteristics. For the purposes of corridor linkages, the section between Moir Park and 94th Street should be a focus for the City by involving landowners in the stewardship of the Creek. Programs to widen the vegetated strip along the stream, limit the use of lawn fertilizers and herbicides/pesticides, and create a linked pathway system between Moir Park and Brookside park are ideas the city may want to consider to strengthen the corridor link. Providing a strong "Green" link with incentives provided by the City and County can serve to jumpstart citizen's interest in becoming active in the improvement of habitat linkages between disconnected blocks of land.

3. **The Hyland-Bush-Anderson Lakes Park Preserves –** These preserves form an extensive network of connected and highly varied habitat types. At the northeastern edge of these preserves, near Normandale Lake, there is a connection to the Nine Mile Creek corridor, though at the southern edge the link to the Minnesota River valley is cut off by continuous residential development.

The large area protected by this park complex is being managed by the Three Rivers Park District. This park complex provides a rich mosaic of landscape types with strong protection and management practices being performed by the Park District. Prairie, forest and wetland maintenance within this park have retained some of the highest quality remnants within Bloominton. Despite it's large size, the preserve may be well served by creating a link to the Minnesota River valley. One potential link could be the existing North-South SOO Line Railway that extends along the western edge of the preserve. Already located at the southeastern corner of the park and at the edge of this rail corridor are bicycle companies and a hub of bike trails that could act as an impetus to strengthen this link. As an active rail corridor, this link is limited, but with the consolidation of rail industry lines, this corridor should be monitored, and if taken off-line in the future, this corridor could provide a link in the unconnected triangle between the three large blocks.

Natural Resources/Open Space Corridor Alignment

City of Bloomington Land Cover Classification and Natural Resources Inventory



Legend

- City Boundary
- Parks
- Streams
- Bloomington Natural Resource Corridor
- Adjacent Natural Resource Corridors

Natural Community Quality

- High Quality
- Good Quality
- Moderate Quality

Hennepin County
Department of Environmental Services
Natural Resources Unit

0 1,750 3,500 7,000 10,500 Feet

1 inch equals 3,500 feet

Figure 9

In establishing an open space corridor planning process, The City of Bloomington may want to consider the following minimum components as a foundation for more detailed planning:

- Public Ownership – Because publicly owned land can be managed according to publicly agreed to parameters by public entities, these lands provide valuable, long term open/natural space potential. Connecting large, publicly owned natural areas with natural or semi-natural open space corridors (both private and public) should be a priority

- Highest Quality Natural Areas – Bloomington is a mostly urbanized setting with a few large blocks of natural and semi-natural areas remaining. Most, though not all of the high quality natural areas are located within protected areas. Some are isolated and privately owned, including three of the four Fen communities and most of the Dry Sand Gravel Prairie Communities. Priority should be placed on the preservation of the highest quality remnant natural areas within the city though the establishment of monitoring, conservation plans and management. Though wetlands already receive some legal protection, they may be threatened by activities that occur at their edges (particularly groundwater fed dependent communities). Establishment of buffer areas to protect the highest quality areas from adjacent landuse changes should be considered. Where these areas are in private ownership, the City should consider options to place these areas into permanent protection (i.e. outright purchase and/or conservation easements). Some of the highest quality remnants are located on private lands directly adjacent to public lands. These lands include remnant Oak Woodland Brushland at the top of the Minnesota River valley bluffs, portions of the Nine Mile Creek corridor in private ownership and privately owned lands (including two fens) at the margins of the large Three Rivers Park complex in northwest Bloomington.

- Connecting Remnant Natural Areas – Where moderate to high quality natural landscape areas remain, the city should focus efforts on creating natural or semi-natural connective corridors between them in order to facilitate the potential movement of natural community species. Semi-natural areas should be incorporated into open space corridor planning as connections between remnant native plant communities, but care should be taken to manage invasive species along these corridors. Semi-natural plant communities can act as conduits for both desirable native species as well as non-native invasive species.

- Encourage Citizen Stewardship of Private Natural Areas - Bloomington contains many large tracts of land in private ownership that the city should make efforts to retain as ecologically healthy communities. These efforts may include education, funding, assistance with alternative funding sources or direct city assistance with site management by city staff.

Independent Citizen Stewardship: Image on left is Mesic Oak Forest one year after buckthorn clearing by residents in Plymouth, Minnesota. Mature White and Red Oak dominate overstory with native shrub and ground layer vegetation regenerating. Adjacent property (D quality ranking) with buckthorn dominanat in ground, shrub and understory layers.

- Restore Natural Areas – Most of Bloomington has long been urbanized and the presence of so many Altered/Non-Native Dominated plant communities is a result of this development. Often the distinction between Native and Altered/Non-Native Dominated communities is a reflection of the domination of Non-Native Invasive species. Though time consuming and costly, invasive species control can be encouraged on private lands as citizens act as landscape stewards (in backyard swaths) and on public lands, targeting areas where the most benefit can accrue (moderate quality areas and targeting the expansion of existing natural areas where invasives are not yet dominant).

- Reconstruct Natural Area Corridors – Suitable lands for connecting remnant natural communities should be reconstructed to native plant communities in order to link high to moderate quality natural areas. These areas should be maintained to conditions that limit the movement of non-native, invasive species between remnant communities. Example corridors may include water courses (including connected wetland complexes, recreational trails, and rail corridors.

- Incorporate Water Resources – Wetlands, lakes, streams, riparian corridors and

Rail corridors form obvious linear corridors, often containing remnant natural areas at their edges, making them obvious candidates for Greenways. Care should be taken when using rail corridors as greenway connections in order to limit the abundance and movement of invasive species. Spotted knapweed is pictured in foreground.

floodplains provide wildlife habitat benefits and are not likely to be developed. These features should provide a framework for linking natural areas (either directly or indirectly). Likewise, these areas should be protected as resources in their own right through the installation and preservation of buffer zones between them and cultural land uses.

- Use Public Trails to Connect Natural Areas – Bloomington has an extensive trail network within it's park system, but the network appears to be limited beyond park boundaries. The city should consider potential future alignments to link the major natural area blocks previously discussed. These trails and others could be used to create open space corridor alignment while continuing to provide recreational and transportation opportunities for citizens. Care must be taken when aligning open space corridor and transportation planning to ensure that corridors do not negatively impact natural areas.

The essential part of the open space corridor system equation is to develop goals and plans for the establishment of such a system where opportunities currently exist, and to identify future trends for corridors and linkages that may open up in the future.

NATURAL AREAS WITH POTENTIAL FOR RARE SPECIES

Within the City of Bloomington, 368 sites were determined to meet "Natural Area" quality with 109 given a rank of A (high) or B (good) quality. These areas have the greatest potential to harbor rare plant species (see **Figure 10** page 59). Great River Greening staff searched for rare species but noted no new locations of listed rare species within Bloomington during the 2007 surveys in the collection of plant community data. Due to budgetary constraints and the MLCCS survey protocol, Great River Greening staff did not conduct additional searches targeted on specific rare species. Rare plant species with some potential for occurring in Bloomington are listed below. The probability that most of these species exist in Bloomington is extremely low, as most of these species have never been recorded in the county or have not been seen since the late 1800s or early 1900s. It also should be noted that the State of Minnesota's official list of rare species is undergoing review and revision in 2007 and the status of some species may change (see the MNDNR website at http://www.dnr.state.mn.us/ets/index.html). It is recommended that the City of Bloomington consult an experienced plant ecologist to determine whether proposed development activities warrant additional rare species inventories on natural/semi-natural areas.

Rare Plant Species Potentially Occurring in Bloomington

(Source: Minnesota Natural Heritage Information System, Division of Ecological Resources, Minnesota Department of Natural Resources)

Mesic and Dry Oak/ Maple Basswood/ Upland Deciduous Forest:
Big tick-trefoil *Desmodium cuspidatum* Special Concern*
Butternut *Juglans cinerea* Special Concern
Ginseng *Panax quinquefolius* Special Concern
Goldie's fern *Dryopteris goldiana* Special Concern*
Handsome sedge *Carex formosa* Endangered*
Lilia-leaved twayblade *Liparis liliifolia* Not Listed (tracked by DNR)
Ovate-leaved skullcap *Scutellaria ovata* Threatened#
Plantain-leaved sedge *Carex plantaginea* Endangered*
Rock clubmoss *Huperzia porophila* Threatened*

Dry Prairie / Dry Prairie Sand – Gravel Subtype:
Biennial gaura *Gaura biennis* Not Listed (tracked by DNR)
Clustered broomrape *Orobanche fasciculata* Special Concern*
Hill's thistle *Cirsium hillii* Special Concern
Kitten-tails *Besseya bullii* Threatened
Louisiana broomrape *Orobanche ludoviciana* Special Concern#
Prairie moonwort *Botrychium campestre* Special Concern#
Rhombic-petaled evening-primrose *Oenothera rhombipetala* Special Concern

Poor Fen – Sedge Subtype/ Wet Meadow:
Club-spur orchid *Platanthera clavellata* Special Concern*
Linear-leaved sundew *Drosera linearis* Special Concern*
Tall nut-rush *Scleria triglomerata* Endangered#
Tubercled rein-orchid *Platanthera flava* var. *herbiola* Endangered#
Twisted yellow-eyed grass *Xyris torta* Endangered*
Water willow *Decodon verticillatus* Special Concern

Floodplain Forest:
Buttonbush *Cephalanthus occidentalis* Not Listed (tracked by DNR) #
Green dragon *Arisaema dracontium* Not Listed (tracked by DNR) #
Kentucky coffee tree *Gymnocladus dioica* Not Listed (tracked by DNR)

* Species last recorded in Hennepin County before 1940
# Species has been recorded in the region but never in Hennepin County

Mixed Emergent Marsh/ Cattail Marsh/ Lake Shore:
Water willow *Decodon verticillatus* Special Concern

Water Lily Open Marsh:
Thread-like naiad *Najas gracillima* Special Concern[#]

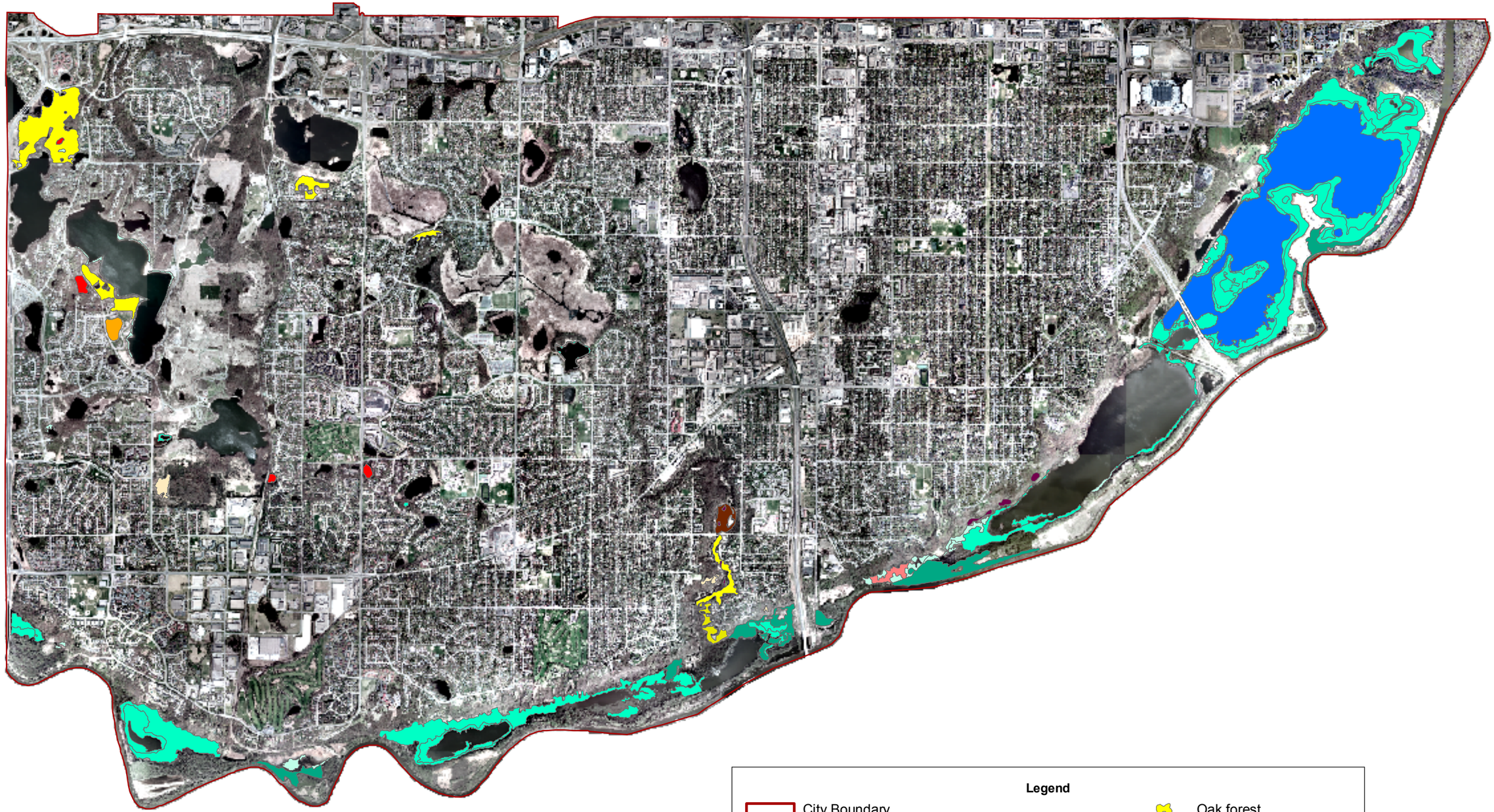
* Species last recorded in Hennepin County before 1940
[#] Species has been recorded in the region but never in Hennepin County

Figure 10 on the following page shows targeted communities (from previous chart) of good to high ranking natural areas with potential for rare species. Figure 10A includes the moderate condition natural communties where rare species would be less likely to inhabit, but which still have potential for restoration/management to conditions that would facilitate their presence.

Figure 10A on page 60 includes those natural community polygons that were given a ranking of A, B, or C. The C ranking is a modifier that includes those areas still clearly recognizable as natural communities but with obvious past disturbance and not dominated by weedy species in any layer.

Natural Areas with Potential for Rare Species

City of Bloomington Land Cover Classification and Natural Resources Inventory



Legend

City Boundary

Natural Areas with the Potential for Rare Species

- Black ash swamp
- Dry Prairie
- Mesic prairie
- Floodplain forest
- Maple-basswood forest
- Oak forest
- Oak woodland-brushland
- Wet meadow
- Mixed emergent marsh
- Poor fen sedge subtype
- Water lily open marsh
- Willow swamp

Hennepin County

Department of Environmental Services
Natural Resources Unit

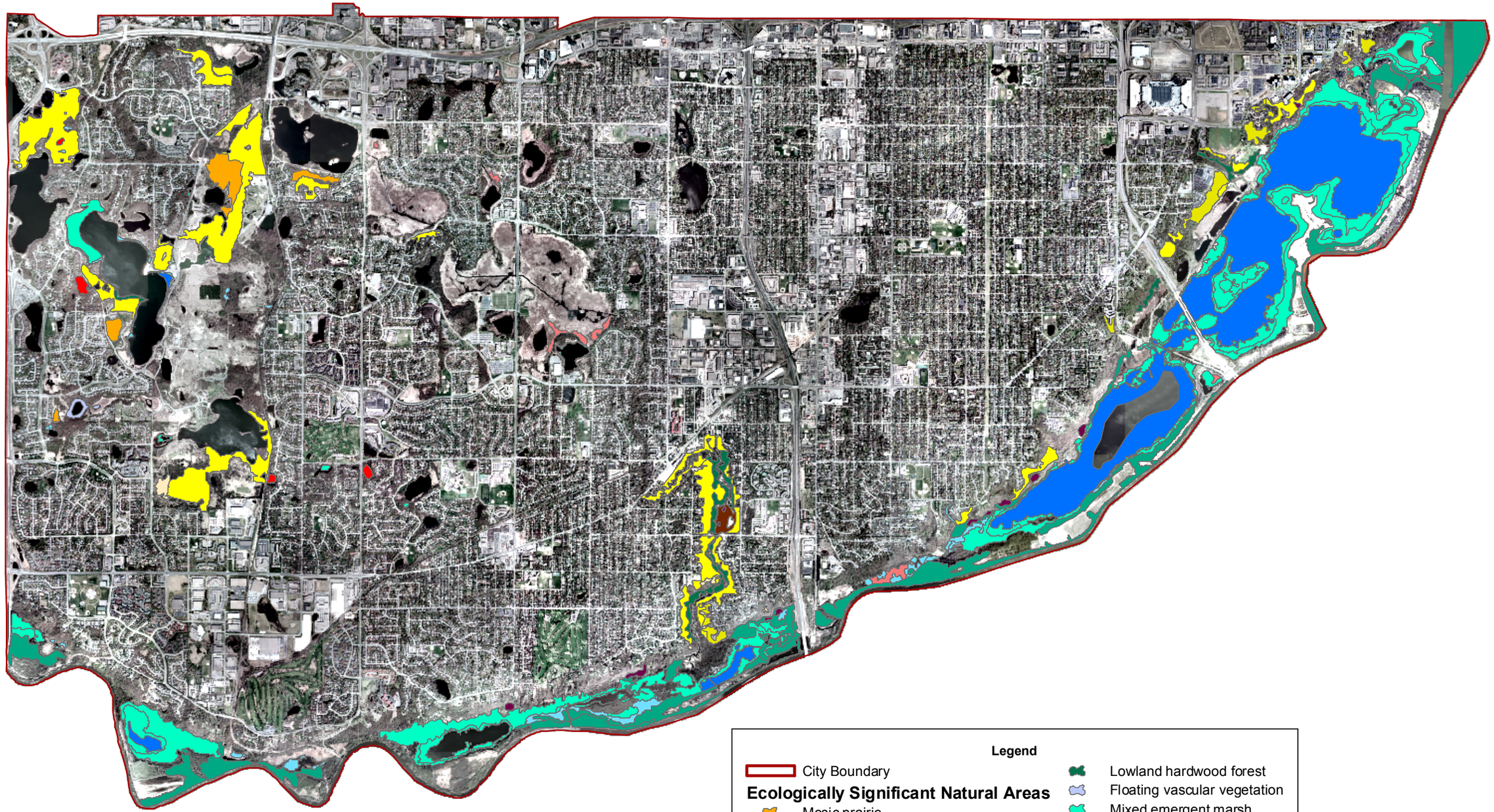
0 1,750 3,500 7,000 Feet

1 inch equals 3,500 feet

Figure 10

Ecologically Significant Natural Areas

City of Bloomington Land Cover Classification and Natural Resources Inventory



Legend

City Boundary

Ecologically Significant Natural Areas

- Mesic prairie
- Dry Prairie
- Maple-basswood forest
- Oak Forest
- Oak woodland-brushland
- Black ash swamp
- Floodplain forest
- Lowland hardwood forest
- Floating vascular vegetation
- Mixed emergent marsh
- Poor fen sedge subtype
- River mud flats
- Water lily open marsh
- Wet meadow
- Willow swamp

0 1,750 3,500 7,000 Feet

1 inch equals 3,500 feet

Hennepin County

Department of Environmental Services
Natural Resources Unit

Figure 10A

NATURAL AREAS ACTIVE MANAGEMENT/PROTECTION RECOMMENDATIONS

The City of Bloomington is nearly completely urbanized at the time of this report. There are, however, numerous remnant natural areas spread throughout the city that warrant attention for their relatively intact ecological integrity. The City of Bloomington contains at least a part or all of 53 Public Land Survey Sections. Thirty-seven have at least one area identified as a natural area (with a ranking) and their geographic distribution is more or less spread throughout the entire city, with the exception of a large area along the northeastern edge west to Nine Mile Creek and south to the Mississippi River bluffs. This MLCCS analysis did not examine which of these lands are publicly or privately owned, and which are in active management, but a predominance of natural area polygons occur in public ownership. We suggest that ownership analysis be undertaken using the new data provided by this MLCCS mapping. Great River Greening ecologists encountered numerous privately owned parcels being actively managed for ecological integrity by citizens, and public/semi-public lands not actively managed and in poor condition and vice versa. This suggests that citizens can take the initiative, particularly on private lands, and cities committed to ecologically healthy open spaces should encourage this initiative as proactively as possible.

Citizen Land Management/Protection - Not all landowners find active land management / protection for ecological integrity appealing, and without incentive, may be reluctant to manage lands for this purpose. We suggest that the City of Bloomington use the MLCCS mapping provided by this project to enable citizens to work with partners including Hennepin County, the Minnesota DNR, the Metropolitan Council, Conservation and Watershed Districts, The Minnesota Land Trust among others to commit to sound management/protection of valuable natural areas that currently exist.

A number of resources are available beyond contacting the above listed agencies. The Minnesota DNR provides numerous publications for land protection at their website: http://www.dnr.state.mn.us/ecological_services/pubs_protect.html. The site provides free downloadable publications including county by county examples, *Going Native: A Prairie Restoration Handbook, Land Protection Options: A Handbook for Minnesota Landowners* and *Natural Areas: Protecting A Vital Community Asset, A Sourcebook for Minnesota Local*

Governments and Citizen. These publications offer ideas, contacts and strategies for individuals, communities and governments to engage in land protection on privately owned lands.

The Minnesota Land Trust offers through its webpage, links to a variety of sources for land preservation: http://www.mnland.org/resources.html. These links provide information on easements, tax benefits, financial aid and practical land management tips for landowners interested in privately owned open space protection.

Public/Semi-Public Lands – Throughout Bloomington many natural areas ranging in quality from low to high, are currently held as public lands in parks and park reserves and as conservation easements in developments. The City of Bloomington should assess the MLCCS mapping created by this project to determine the most beneficial areas for protection within the city. Publicly held natural and semi-natural areas range from very poor semi-natural to high quality remnant natural areas. Using the MLCCS mapping, the City should target areas where restoration/management of existing publicly owned areas would provide the greatest benefit. Areas for consideration may include:

- Targeting degraded portions of large blocks of open space to control invasive species in order to limit expansion into higher quality areas
- Protection of high quality and/or other ecologically significant areas from adjacent land uses, to include controlling weed species as well as protection of water resources entering intact sites
- Management of invasive species in identified corridors to limit expansion of these species into natural areas
- Focusing attention on protecting the water resources that flow either overland or through groundwater to sensitive vegetation communities. These may include the four identified fen communities and seepage swamps all along the base of the Nine Mile Creek and Minnesota River valleys.

Following the establishment of an Open Space Plan, the City may want to consider which remaining parcels of land to acquire should they become available. These may include undeveloped areas along steeply sloping bluffs, backyard dry prairies along the Minnesota River valley, or wetland communities and their edges (as buffers). Loss of, or damage to, wetlands and forests is a slow correction process once the damage has been done. Forests develop structure and function

over centuries, long beyond the scale of individual human lifetimes. For this reason, natural area protection rather than after the fact restoration should be the priority of city planning.

Priority for protection should be placed on protecting/acquiring the highest quality sites, other ecologically significant sites, areas within the identified natural resources corridor and the largest contiguous blocks of remaining natural lands. The city of Bloomington should consider establishing guidelines for acquisition that fit into a long term open space/corridor plan. A priority list, ranking the importance of the qualities of a site to the open space plan should be developed in conjunction with planners, citizens, ecologists and others. A sample of site characteristics that may affect acquisition may include the following parameters:

- Falls into, or is adjacent to, corridors that are identified in this report
- Site quality
- Site size
- Ecological significance within the region
- Availability of lands for acquisition
- Development pressure
- Land Prices

Semi-natural and agricultural lands should also be considered for their ecological benefit if they can be restored to: 1) act as buffers to natural lands; 2) expand existing blocks of natural areas; and 3) can fit into an open space corridor network to connect natural areas. Acquisition and restoration of these lands adjacent to publicly owned quality open spaces may provide the best long term strategy for the long term health of these areas, ensuring that with good planning, these lands can be maintained in perpetuity. The City may be able to receive assistance for sites that are currently publicly owned or those sites acquired in the future as open space with assistance from a variety of public agencies and non-governmental organizations. Agencies that provide assistance include the Minnesota DNR, the US Fish and Wildlife Service, Conservation and Watershed Districts and Hennepin County Environmental Services among others. Non-governmental organizations that may be able to assist with open space management include Pheasants Forever, Ducks Unlimited, Great River Greening and Foundations, etc. Finally, private citizens are also a resource to engage with as funders, sources of land, and participatory land managers.

Zoning and Ordinances - City ordinances and zoning can be used to protect the most valuable resources on public and private lands. Examples of ordinances that have been incorporated for natural area and water resources protection include:

- Setbacks and buffers around sensitive natural areas and features
- Limiting the removal of trees and requiring tree replacement plans when removed
- Encourage and provide incentives for the use of native plantings as an alternative to conventional landscaping
- Prohibiting the intentional planting of state-listed invasive species
- Develop land uses that are compatible with natural areas in order to protect existing natural resources

Finally, through zoning, the city can encourage conservation developments and cluster housing developments to provide protection of natural areas adjacent to or within these developments. The city can help encourage and provide incentives for developers to "self-create" greenways that connect natural areas, and to incorporate permanent sensitive area buffers and permanent conservation easements.

RESULTS

The following general landscape types provided the greatest number of high quality natural areas remaining within the City of Bloomington. The following section provides basic guidance ideas for approaching the protection of these resources, including a brief section on the control of Oak Wilt, a potentially devastating disease to many of Bloomington's natural communities.

Oak Forests

The upland portions of pre-settlement Bloomington were largely dominated by Oak Savanna, with openings of Prairie on the most frequently burned areas and forests in fire-protected areas. Much of the Oak Savannas succeeded to Dry and Mesic Oak Forest in the absence of fire. These forest types currently exist on both public and private lands though the largest blocks are located within the three previously described natural area corridors, and are mostly in public ownership. Most of the forests in Bloomington have been subject to past human disturbances including logging,

homebuilding, grazing, trail building, fire suppression and other activities. Currently, many of these forests have regenerated into structurally rich and diverse plant communities particularly in the Hyland Park area and along the steep slopes of the Minnesota River valley. Others suffer from fragmentation, invasion by non-native invasive species and overuse. Many forests have become dominated with invasive shrubs, particulary Common Buckthorn and over run with non-native Garlic Mustard. There are some good models of how landowners have taken initiative to remove invasive species from their properties. This model should be rewarded and promoted on other properties.

The City of Bloomington should consider establishing guidelines to protect remaining intact natural forest areas using the following guidelines:

- Protect largest forest blocks through acquisition and land management incentives
- Prevent fragmentation by monitoring development and providing guidance to developers and landowners to retain forest blocks in large, natural shapes
- Link existing natural forests through managed corridor planning
- Provide landowner incentives for sound forest management
- Create a plan for targeted invasive species control (MLCCS information includes invasive species coverage percentages in semi-natural and natural areas)

Oak Woodland Brushland

This landcover type is intermediate between Oak Savanna, a grassland with scattered trees and Oak Forest, where the tree canopy is closed. This landcover type was typical of dry soils in the transition zone between the hardwood forests of lake-dotted moraines in Central Minnesota and the open prairies on the more level plains of South Central and Western, Minnesota. This community type depended on periodic fires to clear out the understory, while large trees (predominantly oaks) thrived in the open and formed wide spreading canopies. Most woodlands remaining in the Minnesota River valley are on upper parts of steep south-facing slopes. Nearly all are in very poor condition due to heavy invasion of eastern red cedars or common buckthorn.

There are predominantly three conditions that persist in the Oak Woodland Brushland areas of Bloomington today. In the first, Woodland has nearly completely transitioned to Forest, where young oaks and other tree species have formed a nearly 70% canopy cover, often overtopping the widely branched older trees. In these areas, in the absence of fire, and with shade usually effectively shading out invasive species, GRG recommends allowing these areas to succeed toward, and become Oak Forest.

The second type of Oak Woodland Brushland condition is where the brush layer is younger, and regenerating oaks and other species dominate a subcanopy that has not overtopped the older trees. In these areas, selective thinning of trees is recommended, particularly where younger native species are most dense. Buckthorn should be removed and its reemergence monitored where financially viable. Where these stands have an understory dominated by eastern red cedar (on south facing slopes of the Minnesota River valley), reintroduction of fire through controlled burns to move the community back to oak savanna is recommended.

The third type of Oak Woodland Brushland condition has complete dominance of non-native invasive species in the understory beneath the wide spreading branches of open grown oaks. These areas are most commonly located on private lands at the top of the Minnesota River and Nine Mile Creek blufflands. With an understory mostly dominated by buckthorn, removal is a multiyear process, and has potential risks. Open grown oak woodlands in these areas provide an ideal situation for buckthorn spread as migrating bird species spread buckthorn seed. The City of Bloomington should identify the Woodland Brushland areas along this corridor where control can be most easily managed with landowners (private and public) most likely to stay committed. After identifying areas where the City would like to expand quality Oak Woodland Brushland in these areas, buckthorn should be controlled either by cutting and treating, or basil bark treatments. Most importantly, many of these areas have bare soils, so a plan must be in place in advance to protect the soil resource (erosion control blankets, wattles, mulch, etc…) and replant immediately with a combination of native forb, shrub and tree species of the native plant community type. Where possible, managed fire should be used to control invasive species on these lands and the City should do long term followup in these areas where restoration has begun.

Oak Wilt Control

Oak wilt is a potentially devastating disease to trees of the red oak family (red oak, pin oak, northern pin oak), and to a lesser extent trees of the white oak family (white oak, bur oak). It oftentimes kills all of the red oaks in wooded areas. Oak wilt needs to be diligently prevented and controlled in Bloomington. There was only one area noted where oak wilt was present (natural polygon 22C), and being actively managed by the city of Bloomington.

Red oaks have very high wildlife value, supplying acorns when they are alive, cavities for nesting, and foraging habitat when they die standing. Eventually, they become deadfall and support other life forms in the process. Uncontrolled oak wilt could shorten that process to a few short years, removing the dead oaks and their value in the process, complicating burns and requiring significant resources to control.

The prevalence of oak wilt is considered by most experts to be elevated around by construction activity in rapidly developing areas, and mis-guided transport of diseased wood.

April, May and June: don't wound or prune oaks. If red oak trees are accidentally wounded or pruning is unavoidable, cover the wounds immediately - within minutes -with one of the preferred materials such as water-based paint or shellac (French and Juzwik 2002). This includes no installation of deer stands during this period. Never use tree climbing irons on living oaks. Also avoid wounding or pruning from July through October if possible, as this is a low risk period. November through March is the safe period and the preferred time for pruning since the fungal pathogen and insect vectors are inactive. These measures are designed to restrict the overland dispersal of oak wilt.

Annual Oak Wilt Inspection with Recommendations

For a relatively modest amount, a professional forestry consultant can inspect sites, searching for and identifying diseased oaks. Inspections are done in June/July of every year. Early detection will limit the number of wilted trees and help contain the cost of oak wilt control. Volunteers can assist by doing some pre-surveying and locating suspicious trees for the professionals to diagnose.

For further information on oak wilt, see the publication "Oak Wilt in Minnesota" (French and Juzwik, 2002), on-line at www.extension.umn.edu/distribution/naturalresources/DD3174.html.

Oak Wilt Rapid Response

Oak wilt control is an emerging technology and best management practices are under considerable review and modification recently.

Current principles of oak wilt control include:

- Control intensively and for a sustained period.
- Respond rapidly, as it will spread throughout the roots between neighboring trees.
- If root plowing, use primary and secondary lines, and mark where the line is so any "jumping" of the line by the fungus can be documented.
- If felling diseased trees, treat stumps with herbicide containing active ingredients Triclopyr or Glyphosate
- Roots can regraft, so management actions must take that into consideration.
- Wood of felled wilted trees greater than 3" in diameter needs to be handled properly, as oak wilt mats may form on these logs. (The wood of long-dead trees do not require special handling). This wood will be chipped, burned debarked, buried, milled, or wrapped and sealed in 4-6 mil plastic for 1 year.
- Do not move infected wood long distances until after it has sufficiently dried.

Dry and Mesic Prairie

The City of Bloomington and the Three Rivers Park District have successfully restored and protected a number of remnant prairies, and are gaining a strong knowledge base for their long term maintenance. Both of these agencies have introduced and increased the use of fire as a management tool for retaining prairie with a dominance of native plant species. In the course of MLCCS mapping, some areas were mapped as prairie that had evidently been planted and restored, most were remnants maintained by active land management. There were also numerous open, upland grassland areas where non-native grasses and forbs dominated the plant community and were thus

not identified as “natural” communities, though some are in the process of active restoration. Some pariries are privately owned and located in back yards, some of these in excellent condition.

For the remaining prairie

- There are few protections in place for these upland communities short of active public ownership, so landowner incentives for the remaining privately owned prairie remnants should be considered for their protection (all mapped Mesic Prairie plots are located on public lands).
- Develop a system for using controlled burning to manage the small prairie remnants. This will involve a combination of public outreach and education as well as working with agencies or other groups skilled in the art of controlled burning. The Minnesota Valley Refuge, Great River Greening, Friends of the Minnesota Valley, among others, have established burn crews that can burn on private lands.
- Where possible, acquire or expand public ownership of these sensitive communities.
- Acquire conservation easements for prairies.
- Identify areas where the expansion of successful restoration of prairie is possible. These areas may include public parks, but also rail and road corridors as long as a long term commitment to active restoration can be assured (intensive management for at least 3 years).
- Actively monitor and control runoff and erosion on these sites as many of these prairies lie on steep slopes formed in gravelly soils.
- Monitor and control problematic exotic species. Problematic species in Bloomington prairies include: spotted knapweed, sweet clover, leafy spurge, Canada thistle, bird’s foot trefoil and crown vetch among others. Early detection and response to new invasive species such as cheat grass (*Bromus tectorum*) is key to the prevention of rapid expansion.

Wetlands

Fortunately, wetland laws provide some protection from encroachment into these protected natural areas. The Minnesota Wetland Conservation Act of 1991 specifies no net loss of wetlands within the state and mandates replacement at levels up to two to one. Unfortunately, wetlands continue to be lost to development, draining and other human activities. In the developed portions of

Bloomington, probably the greatest impact to wetlands has been the alteration of hydrology, pollutant loading and encroachment of adjacent plant species from surrounding developments and from (remnant) agricultural lands.

Bloomington contains many remnant natural wetlands that should receive focused protection efforts including the four identified fens, and the large swathes of wetlands in the Minnesota River valley. In very few cases are these wetlands threatened by outright destruction (filling), but more often are threatened by activities at the margins. Alterations to plant communities at the margins can offer space for invasive species to invade and potentially dominate existing natural communities. Likewise, alteration to hydrology can create conditions that favor invasive species, notably reed canary grass, hybrid cattails and giant reed grass. Hydrologic alterations tend to have the effect of shifting plant communities as plants adapted to different hydrologic regimes move in to replace existing plant species.

The City of Bloomington should consider retaining , strengthening and adopting ordinances and incentives for citizens and developers to:

- Carefully consider the effects of any hydrologic alteration (either increases or decreases) that could adversely impact natural wetland communities.
- Acquire, create, retain and incentivize wetland and streambank buffers to protect these communities from pollutant loading, altered hydrology and encroachment of non-native invasive species.
- Monitor wetland health, with a focus on retaining ranked (particularly moderate to high quality) wetland communities on both private and public lands, targeting invasive species removal and control.
- Manage surface water resources so that groundwater recharge is retained in order to protect groundwater fed wetland plant communities. Encouraging infiltration practices of clean stormwater runoff in the upper portions of Bloomington is an important goal to protecting the water resources at the base of the communities' River valleys. Community types particularly affected by groundwater discharge include Black Ash Seepage Swamps.

- Identify where invasive species can be removed most cost effectively, focusing on protecting existing plant communities with information provided with this inventory. Targets should include removal of glossy buckthorn in fens, common buckthorn in black ash seeps and keeping reed canary grass and tall reed grass at bay where they threaten in-tact and valuable identified open wetland types.
- Poor fens are small basins that receive minmal surface water runoff. Runoff of fertilizers of road salt will completely destroy the sphagnum mat and the community will disappear. Now that these communities have been identified and mapped, Hennepin County and the city of Bloomington should identify the specific threats to the few remaining remnant communities and remedy potential harmful actions at their margins.

Minnesota River Bottoms

The Minnesota River Bottoms include the largest contiguous natural areas of Bloomington and contain the vast majority of mapped natural area polygons. Though this is a working (barge and agriculture) landscape, the Minnesota River backwaters in the Bloomington portion contain a vast reservoir of native plant communities, intact soils and habitat for multitudes of animal species. Protections in this valley should include efforts to:

- Protect native plant communities at the base of the bluff from harmful land uses, including dumping, poor trail building, and excess untreated upland stormwater runoff.
- Manage invasive species before they are entirely entrenched. While reed canary grass is well established, other species are only beginning to become a problem and should be controlled at the earliest possible time. These species include tall reed grass, and buckthorn, both common and glossy. Tall reed grass is growing in patches, particularly in wet meadows along the Minnesota River bottoms, and while it has become dominant in a few locations, control in many of the small wet meadows may still be possible. Likewise, the buckthorns are often dominant along the upper slopes, but much less so along the river bottoms where they are beginning to become a greater presence. Control in these areas may not yet be cost prohibitive.

- Protect the water resource, taking care not to allow the backwaters of the river valley to become stormwater treatment basins. Sediment controls should be strongly enforced within the neighborhoods of Bloomington as a measure to protect this resource.

NATURAL AREAS IDENTIFIER MAP AND SITE DESCRIPTIONS

During the course of field checking all mapped areas, semi-natural and natural areas were assessed for natural area quality. Landscape area writeups were performed for all natural areas. Field surveyors performed meander searches recording major species present, noting the presence and abundance of invasive species, assigning a quality ranking according to the DNR's Natural Heritage Element Occurrence Ranking Guidelines (described on page 17) and recording notes on general conditions and characteristics of each site. Each natural area site was then assigned a Polygon ID number to link notes taken with the location within the city.

Figure 11 on the following page depicts natural areas identified during the above process with the assigned Polygon ID number. Complete descriptions of all Natural Area polygons are provided in Appendix 3 of this document beginning on page 88.

Species List Identification Numbers

City of Bloomington Land Cover Classification and Natural Resources Inventory

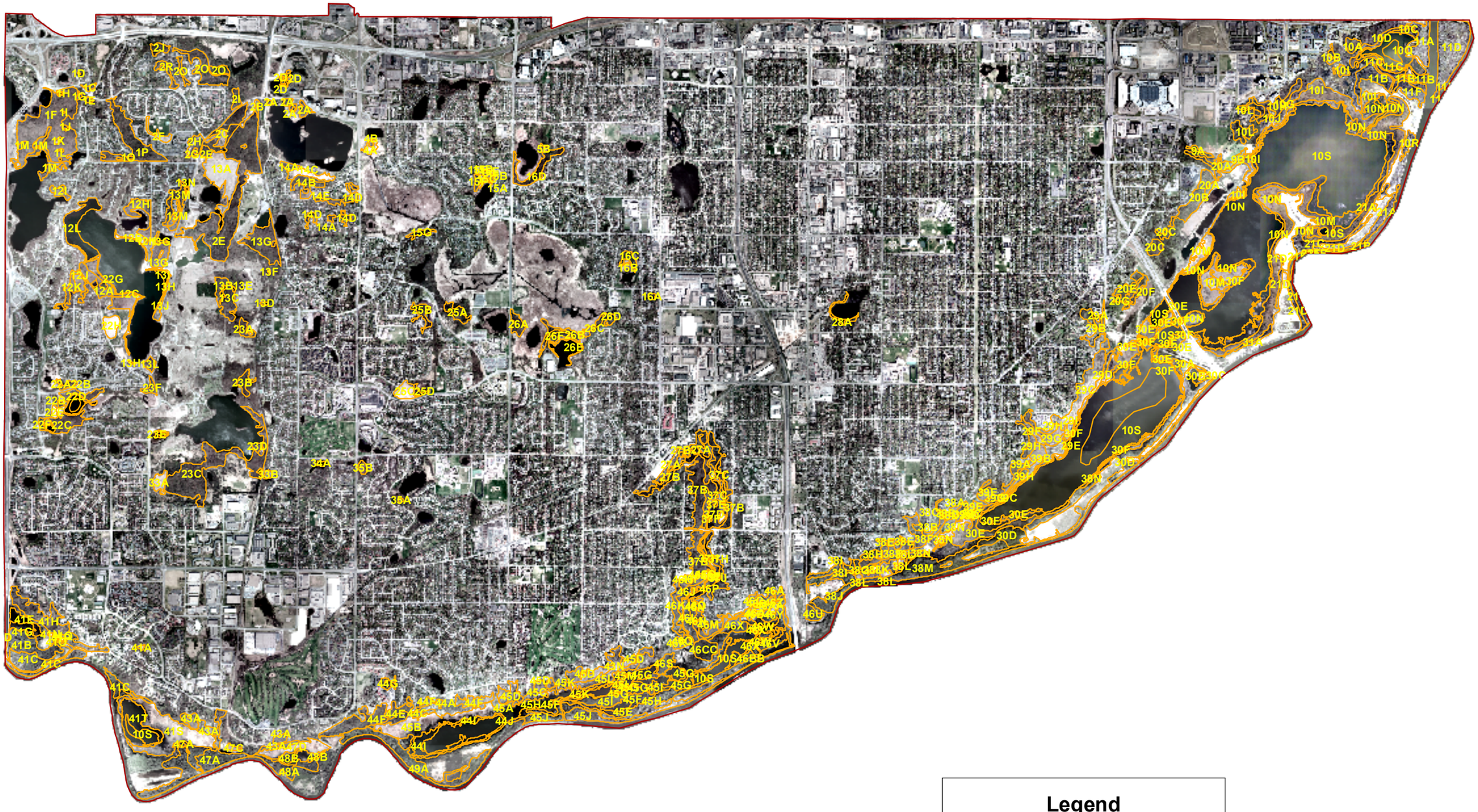


Figure 11

References

Grimm, E.C. 1984. Fire and other factors controlling the Big Woods vegetation of Minnesota in the mid-nineteenth century. Ecological Monographs. 54: 291-311

French, David W. and Jennifer Juzwick. 2002. Oak Wilt in Minnesota. Published by the University of Minnesota Extension Service. Available at: http://www.extension.umn.edu/distribution/naturalresources/DD3174.html

Heinselman, M.L. 1974. Interpretation of Francis J. Marschner's map of the original vegetation of Minnesota. Text printed on the back side of Marschner's map. U.S. Forest Service, North Central Forest Experiment Station, St. Paul.

Marschner, F.J. 1974. The original vegetation of Minnesota. Map compiled from U.S. General Land Office survey notes. U.S. Forest Service, North Central Forest Experiment. Station, St. Paul.

MnDNR. 2004. Minnesota Land Cover Classification System User Manual. Version 5.4. Minnesota Department of Natural Resources, Central Region.

APPENDIX A

Summary Tables

Level 1 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
10000	Artificial surfaces and associated areas	13274.3	799
20000	Planted or Cultivated Vegetation (greater than 96% vegetation cover)	3636.8	1116
30000	Forests	2959.4	526
40000	Woodland	273.0	47
50000	Shrubland	48.8	23
60000	Herbaceous	3035.6	569
80000	Sparse vegetation	10.3	4
90000	Water	1304.0	238
	Totals:	**24,542.2**	**3,322**

Level 3 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
10xxx			
11200	Artificial surfaces with deciduous tree cover	308.3	29
11300	Artificial surfaces with mixed coniferous and deciduous tree cover	14.0	2
13100	Artificial surfaces with perennial grasses with sparse trees	8082.2	224
13200	Artificial surfaces with perennial grasses	133.9	11
14100	Buildings and/or pavement	4646.4	505
14200	Exposed earth	89.5	28
	Subtotal:	13274.3	799
20xxx			
21100	Planted, maintained or cultivated coniferous trees	27.9	15
21200	Planted, maintained or cultivated deciduous trees	124.1	61
21300	Planted, maintained or cultivated mixed coniferous and deciduous trees	26.8	12
22200	Planted, maintained or cultivated deciduous shrub/vine vegetation	0.5	1
23100	Planted or maintained grasses with sparse tree cover	1643.7	515
23200	Planted or maintained grasses	1653.9	470
23300	Planted or maintained grasses and forbs	139.7	40
24100	Row cropland	12.5	1
24200	Close grown or solid seeded cropland	7.6	1
	Subtotal:	3636.8	1116

Level 3 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
30xxx			
32100	Upland deciduous forest	1694.8	296
32200	Temporaily flooded deciduous forest	1222.3	202
32300	Saturated deciduous forest	23.5	21
32400	Seasonally flooded deciduous forest	18.8	7
	Subtotal:	2959.4	526
40xxx			
42100	Upland deciduous woodland	243.3	40
42200	Temporarily flooded deciduous woodland	5.7	2
42400	Seasonally flooded deciduous woodland	13.7	2
43100	Upland mixed coniferous-deciduous woodland	10.4	3
	Subtotal:	273.0	47
50xxx			
52100	Upland deciduous shrubland	10.7	7
52200	Temporaily flooded deciduous woodland	6.3	2
52300	Saturated deciduous shrubland	0.9	1
52400	Seasonally flooded deciduous shrubland	31.0	13
	Subtotal:	48.8	23

Level 3 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
60xxx			
61100	Tall grassland	134.6	15
61200	Medium-tall grassland	38.4	22
61300	Temporarily flooded graminoid vegetation	121.7	29
61400	Saturated graminoid vegetation	269.4	112
61500	Seasonally flooded emergent vegetation	220.6	115
61600	Semipermanently flooded emergent vegetation	493.1	117
61700	Intermittently exposed emergent vegetation	362.2	39
61800	Permanently flooded emergent vegetation	332.6	49
62100	Grassland with sparse deciduous trees	166.8	31
62200	Grassland with sparse conifer or mixed deciduous/coniferous trees	14.6	3
62300	Temporarily flooded grassland with sparse deciduous trees	15.0	6
62400	Saturated grassland with sparse deciduous trees	60.0	18
62500	Seasonally flooded grassland with sparse deciduous trees	3.9	2
63200	Saturated forb vegetation	0.3	1
64100	Standing water hydromorphic rooted vegetation	802.4	10
	Subtotal:	3035.6	569
80xxx			
82200	Cobble / gravel beaches and shores	4.0	2
83200	Temporarily flooded sand flats	0.6	1
83300	Seasonally/Temporarily flooded mud flats	5.7	1
	Subtotal:	10.3	4

Level 3 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
90xxx			
91100	Slow moving linear open water habitat	41.9	8
91200	Fast moving linear open water habitat	282.2	15
92100	Limnetic open water	358.2	7
92200	Semipermanently flooded littoral aquatic bed	37.6	7
92400	Permanently flooded littoral aquatic bed	11.8	3
92500	Littoral open water	4.5	1
93200	Permanently flooded aquatic bed	14.6	6
93300	Palustrine open water	553.3	191
	Subtotal:	1304.0	238
	Totals:	**24542.2**	**3322**

Level 5 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
11211	Oak (forest or woodland) with 4-10% impervious cover	2.8	1
11221	Oak (forest or woodland) with 11- 25% impervious cover	7.0	2
11229	Other deciduous trees with 11- 25% impervious cover	1.4	1
11230	26% to 50% impervious cover with deciduous trees	1.8	1
11231	Oak (forest or woodland) with 26-50% impervious cover	212.9	15
11239	Other deciduous trees with 26-50% impervious cover	70.7	8
11241	Oak (forest or woodland) with 51-75% impervious cover	11.8	1
11314	Planted mixed coniferous/deciduous trees with 4-10% impervious cover	4.2	1
11324	Planted mixed coniferous/deciduous trees with 11-25% impervious cover	9.9	1
13124	Short grasses and mixed trees with 11-25% impervious cover	40.4	10
13134	Short grasses and mixed trees with 26-50% impervious cover	3941.2	110
13144	Short grasses and mixed trees with 51-75% impervious cover	4100.7	104
13210	4% to 10% impervious cover with perennial grasses	7.0	1
13211	Short grasses with 4-10% impervious cover	1.2	1
13221	Short grasses with 11-25% impervious cover	4.8	2
13231	Short grasses with 26-50% impervious cover	1.3	1
13232	Non-native dominated long grasses with 26-50% impervious cover	3.9	1
13241	Short grasses with 51-75% impervious cover	115.9	5
14112	Pavement with 76-90% impervious cover	10.1	5
14113	Buildings and pavement with 76-90% impervious cover	671.7	76
14121	Buildings with 91-100% impervious cover	302.0	63
14122	Pavement with 91-100% impervious cover	1603.9	129
14123	Buildings and pavement with 91-100% impervious cover	2058.7	232
14214	Other exposed/transitional land with 0-10% impervious cover	64.0	22
14224	Other exposed/transitional land with 11-25% impervious cover	21.3	4
14234	Other exposed/transitional land with 26-50% impervious cover.	4.2	2

Level 5 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
21111	Spruce/fir trees on upland soils	8.6	5
21112	White pine trees on upland soils	0.3	1
21113	Red pine trees on upland soils	12.9	6
21114	Coniferous trees on upland soils	6.2	3
21213	Deciduous trees on upland soils	124.1	61
21310	Upland soils with planted, maintained or cultivated mixed coniferous/deciduous trees	26.8	12
22210	Upland soils with planted, maintained or cultivated deciduous shrub/vine vegetation	0.5	1
23100	Planted or maintained grasses with sparse tree cover	2.8	1
23110	Upland soils with planted or maintained grasses and sparse tree cover	37.6	4
23111	Short grasses with sparse tree cover on upland soils	1431.6	433
23112	Long grasses with sparse tree cover on upland soils	148.1	66
23121	Short grasses with sparse tree cover on hydric soils	17.9	9
23122	Long grasses with sparse tree cover on hydric soils	5.7	2
23211	Short grasses on upland soils	1032.9	252
23212	Long grasses on upland soils	577.4	188
23220	Hydric soils with planted or maintained grasses	4.3	3
23221	Short grasses on hydric soils	9.2	7
23222	Long grasses on hydric soils	30.1	20
23312	Long grasses and forbs on upland soils	124.1	33
23322	Long grasses and forbs on hydric soils	15.6	7
24112	Corn	12.5	1
24217	Hayfield	7.6	1

Level 5 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
32112	Oak forest mesic subtype	597.8	72
32113	Oak forest dry subtype	239.3	8
32150	Maple-basswood forest	10.7	1
32170	Altered/non-native deciduous forest	846.9	215
32210	Floodplain forest	358.2	30
32211	Floodplain forest silver maple subtype	285.1	24
32220	Lowland hardwood forest	124.9	22
32240	Altered/non-native temporarily flooded deciduous forest	454.0	126
32311	Black ash swamp seepage subtype	18.6	18
32340	Altered/non-native saturated soils deciduous forest	5.0	3
32430	Altered/non-native seasonally flooded deciduous forest	18.8	7
42120	Oak woodland-brushland	231.6	31
42130	Altered/non-native deciduous woodland	11.7	9
42210	Altered/non-native deciduous woodland - temporarily flooded	5.7	2
42410	Altered/non-native deciduous woodland - seasonally flooded	13.7	2
43110	Altered/non-native mixed woodland	10.4	3
52120	Native dominated disturbed upland shrubland	3.4	2
52130	Altered/non-native dominated upland shrubland	7.3	5
52220	Altered/non-native dominated temporarily flooded shrubland	6.3	2
52330	Altered/non-native dominated saturated shrubland	0.9	1
52420	Wet meadow shrub subtype	1.4	1
52430	Willow swamp	24.4	7
52440	Altered/non-native dominated seasonally flooded shrubland	5.2	5

Level 5 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
61110	Mesic prairie	68.2	7
61120	Tall grass altered/non-native dominated grassland	66.4	8
61210	Dry Prairie	6.1	1
61213	Dry prairie sand-gravel subtype	5.4	9
61220	Medium-tall grass altered/non-native dominated grassland	26.8	12
61330	Temporarily flooded altered/non-native dominated grassland	121.7	29
61420	Wet meadow	13.6	6
61451	Poor fen sedge subtype	9.8	4
61480	Saturated altered/non-native dominated graminoid vegetation	246.0	102
61520	Mixed emergent marsh - seasonally flooded	3.6	3
61530	Seasonally flooded altered/non-native dominated emergent vegetation	148.8	87
61540	Wet meadow - seasonally flooded	68.3	25
61620	Mixed emergent marsh	346.2	26
61630	Semipermanently flooded altered/non-native dominated vegetation	131.8	76
61640	Wet meadow - semipermanently flooded	14.1	13
61641	Wet meadow floating mat subtype	1.0	2
61720	Mixed emergent marsh - intermittently exposed	180.2	18
61730	Intermittently exposed altered/non-native dominated vegetation	182.0	21
61820	Mixed emergent marsh - permanently flooded	260.3	27
61830	Permanently flooded altered/non-native dominated vegetation	72.3	22
62140	Grassland with sparse deciduous trees - altered/non-native dominated vegetation	166.8	31
62220	Grassland with sparse conifer or mixed deciduous/coniferous trees - altered/non-native dominated	14.6	3
62310	Altered/non-native grassland with sparse deciduous trees - temporarily flooded	15.0	6
62410	Altered/non-native grassland with sparse deciduous trees - saturated soils	60.0	18
62510	Altered/non-native grassland with sparse deciduous trees - seasonally flooded	3.9	2

Level 5 Land Cover Summary			
MLCCS Code	**Description**	**Total Acres**	**# of Polygons**
63210	Seepage meadow	0.3	1
64111	Water lily open marsh	802.4	10
82210	Cobble / gravel shore	4.0	2
83212	Riverine sand flats - bars	0.6	1
83312	River mud flats	5.7	1
91100	Slow moving linear open water habitat	41.9	8
91200	Fast moving linear open water habitat	282.2	15
92100	Limnetic open water	358.2	7
92200	Semipermanently flooded littoral aquatic bed	7.3	2
92220	Floating vascular vegetation - semipermanently flooded littoral aquatic bed	30.3	5
92420	Floating vascular vegetation - permanently flooded littoral aquatic bed	11.8	3
92500	Littoral open water	4.5	1
93200	Permanently flooded aquatic bed	4.2	4
93220	Floating vascular vegetation	10.4	2
93300	Palustrine open water	553.3	191
	Totals:	**24542.2**	**3,322**

APPENDIX B

Natural Areas Species Lists

Species List Identification Numbers

City of Bloomington Land Cover Classification and Natural Resources Inventory

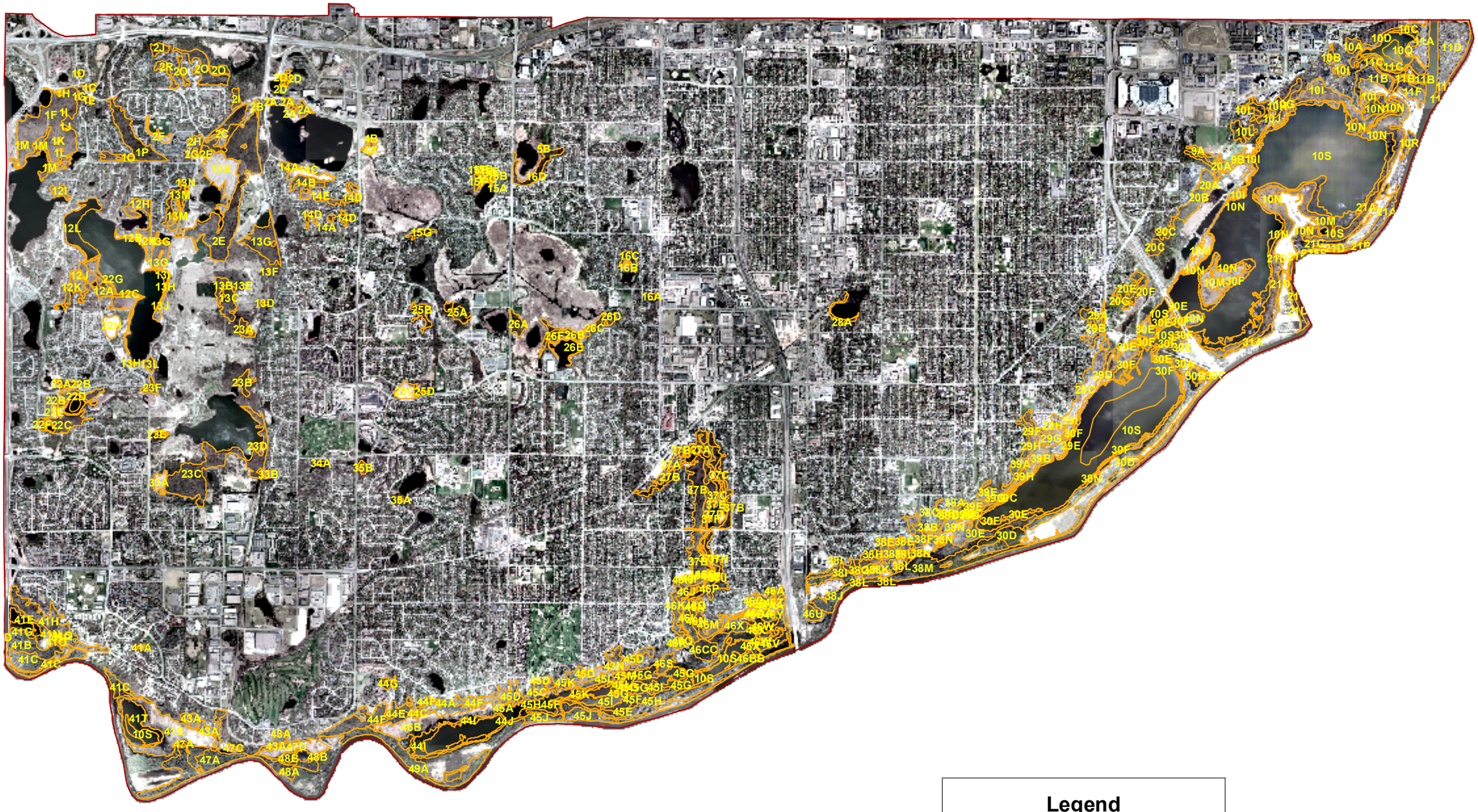


Figure 11

Natural Polygon ID	1C	MLCCS Code	42120
Community Description	Oak Woodland Brushland	Quality Ranking	D-
Field Check Level	4	Invasives	408-6
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Ulmus americana*	American Elm
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus alba	White Oak
Subcanopy	*Malus sp.*	Apple (planted)
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Carex pennsylvanica*	Sun Loving Sedge
	Carex roseus	Starry Sedge
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Smilacina racemosa	False Solomon's seal

Notes: Very poor quality remnant Oak Savanna overgrown by Buckthorn. Ground layer minimal. Open grown oaks form widely spaced (60%) canopy along with occasional Elm and planted apple.

Natural Polygon ID	1D	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	C
Field Check Level	2	Invasives	
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake Sedge
	Matteuccia struthiopteris (cf.)	Ostrich Fern
	Theliptis palustris	Marsh Fern
	Lemna minor	Lesser Duckweed
	Asclepias incarnata	Marsh Milkweed

Notes: Floating center island located in isolated depression. Depression is surrounded by remnant, disturbed forest with residential lots directly adjacent to wetland. Inaccessible site was viewed from shore.

Natural Polygon ID	1E	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-4
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus alba	White Oak
	Populus tremuloides	Quaking Alpen
Subcanopy	*Populus tremuloides*	Quaking Alpen
	Ulmus americana	American Elm
	Tilia americana	American Basswood
	Rhamnus cathartica	Common Buckthorn
	Prunus serotina	Black Cherry
	Acer saccharum	Sugar Maple
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Symphorocapus alba	Snowberry
Ground	*Arisaema triphyllum*	Jack-in-the-pulpit
	Athyrium felix-femina	Lady Fern
	Geranium maculatum	Wild Geranium
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Smilacina racemosa	False Solomon's seal
	Thalictrum dioicum	Early Meadow-rue
	Toxicodendron radicans	Common Poison Ivy

Notes: Poor quality, though small and isolated Oak forest with mix of Aspen and White/Red Oak canopy. Converting to Maple Basswood forest with Sugar maple common/dominant in understory with no oaks present in understory.

Natural Polygon ID	1F	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	A/B
Field Check Level	4	Invasives	408-2
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus alba	White Oak
	Populus tremuloides	Quaking Alpen
	Quercus rubra	Red Oak
Subcanopy	*Populus tremuloides*	Quaking Alpen
	Tilia americana	American Basswood
	Ostrya virginiana	Ironwood
	Prunus serotina	Black Cherry
	Acer saccharum	Sugar Maple
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Lonicera tatarica	Tartarian Honeysuckle
	Prunus virginiana	Common Chokecherry
Ground	*Tilia americana*	American Basswood
	Aquilegia canadensis	Wild Columbine
	Aralia nudicaulus	Wild Sarsaparilla
	Arisaema triphyllum	Jack-in-the-pulpit
	Athyrium felix-femina	Lady Fern
	Carex gracillima	Graceful Sedge
	Carex - ovales type	An Ovales type sedge
	Carex pennsylvanica	Sun Loving Sedge
	Fraxinus pennsylvanica	Green Ash
	Galium aparine	Cleavers
	Galium boreale	Northern bedstraw
	Geranium maculatum	Wild Geranium
	Maianthemum canadense	Canada May Flower
	Osmunda claytoniana	Interrpted Fern
	Poa pratensis	Kentucky Bluegrass
	Parthenocicus inserta	Woodbine
	Polyonatum biflorum	Giant Solomon's Seal
	Rhamnus cathartica	Common Buckthorn

Natural Polygon ID	1F	MLCCS Code	32113
Ground	*Ribes cynosbati*	Prickley Gooseberry	
	Smilacina racemosa	False Solomon's seal	
	Streptopus amplexifolius	Clasping Twisted Stalk	
	Thalictrum dioicum	Early Meadow-rue	
	Thalictrum thalictroides	Flase Meadow Rue	
	Toxicodendron radicans	Common Poison Ivy	
	Vitis riparia	Riverbank Grape	
	Trillium cernuum	Nodding trillium	
	Ribes americanum	Wild Black Currant	
	Rubus Idaeus	Red Raspberry	
	Carex blanda	Charming Sedge	
	Oxalis stricta	Yellow Wood Sorrel	
	Arcteum minor	Common Burdock	
	Sambucus canadensis	Common Elder	
	Carex disperma	Soft-leaved Sedge	
	Leersia virginica	White Grass	

Notes: Large, and mixed quality Oak Forest with minimal invasion by invasive species. Buckthorn only common near other invaded forest areas and at margins. Multiple isolated high quality wetlands located within this stand. Some areas cut over (and mapped as 32170) should be monitored for spread of invasives into higher quality areas. Mostly forest grown oaks dominant in overstory throughout, though Basswood and Sugar maple are common in Understory.

Natural Polygon ID	1G	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	D
Field Check Level	4	Invasives	412-3
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Ground	*Scirpus fluviatalis*	River Bulrush
	Carex languinosa	Woolly Sedge
	Phalaris arundinacea	Reed Canary Grass
	Polygonum amphibium	Water Smartweed

Notes: Near monotype of River bulrush with Reed canary grass dominated margin

Natural Polygon ID	1H	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	D
Field Check Level	4	Invasives	412-2, 409-2
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Populus tremuloides*	Quaking Aspen
Shrub	*Euonymus alatus*	Burning Bush
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Carex bebii	Bebb's Sedge
	Carex languinosa	Woolly Sedge
	Carex Ovales Type	A Sedge Species
	Geranium maculatum	Wild Geranium
	Onoclea sensibilis	Sensitive Fern
	Phalaris arundinacea	Reed Canary Grass
	Poa pratensis	Kentucky Bluegrass
	Potentilla sp	Cinquefoil (planted)

Notes: Stormwater pond edge. Low quality, though native sedge meadow species dominant in herbaceous layer. Poor choices for shrub plantings in a natural area include non-native Burning Bush (potentially invasive) and Cinquefoil cultivar.

Natural Polygon ID	1I	MLCCS Code	61640
Community Description	Wet Meadow - semipermanently flooded	Quality Ranking	C
Field Check Level	4	Invasives	
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Ground	*Carex utriculata*	Beaked Sedge
	Iris versicolor	Northern Blueflag Iris
	Pilea pumila	Dwarf Clearweed
	Unknown Grass	Unknown Grass

Notes: Isolated depression dominated by unknown (no seed heads) grass, and scattered patches of sedges and forbs. Mostly mudflat located within shade of surrounding oak forest.

Natural Polygon ID	1J	**MLCCS Code**	61640
Community Description	Wet Meadow - semipermanently flooded	**Quality Ranking**	C
Field Check Level	4	**Invasives**	412-3
Surveyor	TR	**Date**	5/30/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake sedge
	Carex sp.	A Sedge Species
	Iris versicolor	Northern Blueflag Iris
	Lycopus americana	Water Horehound
	Lysimachia terrestris	Yellow Loosestrife
	Phalaris arundinacea	Reed Canary Grass
	Pilea pumila	Dwarf Clearweed
	Scirpus fluviatalis	River bulrush
	Solanum dulcamara	Bittersweet Nightshade

Notes: Isolated wet meadow located within heavily disturbed forest. Reed canary Grass common at margins.

Natural Polygon ID	1K	MLCCS Code	61451
Community Description	Poor fen sedge subtype	Quality Ranking	A
Field Check Level	4	Invasives	412-2
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Carex alata	Winged Sedge
	Carex lacustris	Lake sedge
	Carex languinosa	Woolly Sedge
	Carex lasiocarpa	Wiregrass Sedge
	Carex Ovales Type	A Sedge Species
	Carex sp.	A Sedge Species
	Carex tenera	Marsh Straw Sedge
	Carex utriculata	Beaked Sedge
	Carex vulpinoidea	Fox Sedge
	Iris versicolor	Northern Blueflag Iris
	Luzula acumunata	Pointed Woodrush
	Lycopus americana	Water Horehound
	Lysimachia terrestris	Yellow Loosestrife
	Phalaris arundinacea	Reed Canary Grass
	Polygonum hydropiper	Marsh Waterpepper
	Sagittaria latifolia	Broad-leaved Arrowhead
	Sparganium sp.	Bur Reed
	Theliptris palustris	Marsh Fern

Notes: Poor fen isolated within larger Oak Forest stand. Some Reed Canary Present, but only on mineral soils at edge. Floating mat in center dominated by wiregrass sedge and marsh fern on Sphagnum moss. Outer margins dominated by wider blade sedges (*C. lacustis, C.uticulata).* Forest margins are dominated by a wide variety of sedge species.

Natural Polygon ID	1L	**MLCCS Code**	61640
Community Description	Wet Meadow - Semipermanently Flooded	**Quality Ranking**	A/B
Field Check Level	4	**Invasives**	412-2
Surveyor	TR	**Date**	5/30/2007

Location	Scientific Name	Common Name
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Carex lacustris	Lake sedge
	Carex alata	Winged Sedge
	Carex utriculata	Beaked Sedge
	Iris versicolor	Northern Blueflag Iris
	Carex languinosa	Woolly Sedge
	Carex sp.	A Sedge Species
	Carex Ovales Type	A Sedge Species
	Lycopus americana	Water Horehound
	Potentilla norvegica	Rough Cinquefoil
	Phalaris arundinacea	Reed Canary Grass

Notes: Small, isolated wet meadow located within large Oak Forest community. Reed canary grass present, but limited. Dominated by Lake sedge with other sedge species located at wooded margins.

Natural Polygon ID	1M	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-3, 411-2
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Boxelder
	Populus deltoides	Cottonwood
	Populus tremuloides	Quaking Aspen
	Prunus serotina	Black Cherry
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
	Tilia americana	American Basswood
	Ulmus americana	American Elm
Subcanopy	*Ostrya virginiana*	Ironwood
	Prunus serotina	Black Cherry
	Rhamnus cathartica	Common Buckthorn
	Tilia americana	American Basswood
	Ulmus americana	American Elm
Shrub	*Cornus alternifolia*	Pagoda Dogwood
	Prunus virginiana	Common Chokecherry
	Rhamnus cathartica	Common Buckthorn
	Rubus idaeus	Red Raspberry
Ground	*Geranium maculatum*	Wild Geranium
	Phalaris arundinacea	Reed Canary Grass
	Poa pratensis	Kentucky Bluegrass
	Tilia americana	American Basswood

Notes: Lowland forest located at the edge of lake. Poor quality with openings dominated by Reed Canary Grass. Shrub layer dominated by Buckthorn. Trees a mix of Oak forest and lowland type trees, with large cottonwoods scattered, though Basswood is dominant throughout.

Natural Polygon ID	1O	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	D
Field Check Level	4	Invasives	412-3
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Salix nigra*	Black Willow
Shrub	*Salix exigua*	Sandbar Willow
	Sambucus canadensis	Common Elder
Ground	*Scirpus fluviatalis*	River Bulrush
	Carex languinosa	Woolly Sedge
	Phalaris arundinacea	Reed Canary Grass
	Carex alata	Winged sedge
	Polygonum amphibium	Water Smartweed
	Pilea pumila	Dwarf Clearweed
	Urtica dioica	Stinging Nettle
	Galium aparine	Cleavers
	Arcteum minor	Common Burdock

Notes: Heavily sedimented stormwater wetland between road and neighborhood. Neighbors dumping leaves and fill at edge. Dominated by River Bulrush with some Reed Canary Grass and Burdock present.

Natural Polygon ID	1P	MLCCS Code	32112
Community Description	Oak Forest - Dry subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 411-3, 410-3
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Populus tremuloides	Quaking Aspen
	Quercus alba	White Oak
	Quercus rubra	Red Oak
Subcanopy	*Celtis occidentalis*	Hackberry
	Populus tremuloides	Quaking Aspen
	Prunus serotina	Black Cherry
	Rhamnus cathartica	Common Buckthorn
	Ulmus americana	American Elm
Shrub	*Cornus alternifolia*	Pagoda Dogwood
	Lonicera tatarica	Tartarian Honeysuckle
	Prunus virginiana	Common Chokecherry
Shrub	*Rhamnus cathartica*	Common Buckthorn

Natural Polygon ID	1P	**MLCCS Code**	32112

Ground	*Alliaria petiolaris*	Garlic Mustard
	Aquilegia canadensis	Wild Columbine
	Arisaema triphyllum	Jack-in-the-pulpit
	Athyrium felix-femina	Lady Fern
	Carex gracillima	Graceful Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex rosea	Starry Sedge
	Fraxinus pennsylvanica	Green Ash
	Galium aparine	Cleavers
	Geranium maculatum	Wild Geranium
	Maianthemum canadense	Canada May Flower
	Oxalis montana	Common Wood Sorrel
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Ribes cynosbati	Prickley Gooseberry
	Smilacina racemosa	False Solomon's seal
	Toxicodendron radicans	Common Poison Ivy
	Vitis riparia	riverbank Grape

Notes: Heavily Disturbed and highly variable long strip of Mesic Oak Forest between housing developments and roads. Mixed forest grown Oaks dominate in most of the Canopy. Heavily invaded by Buckthorn and Honeysuckle throughout. Garlic Mustard is common. Some areas have been logged with aspens filling gaps. Maintenance for invasive shrubs and Garlic Mustard ongoing, mostly at the edge, though interior thick with all.

Natural Polygon ID	2A	**MLCCS Code**	32112
Community Description	Oak Forest - Mesic subtype	**Quality Ranking**	D
Field Check Level	3	**Invasives**	408-6, 410-3
Surveyor	TR	**Date**	5/22/2007

Location	**Scientific Name**	**Common Name**
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Populus deltoides	Cottonwood
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Carex pennsylvanica*	Sun Loving Sedge
	Arisaema triphyllum	Jack-in-the-Pulpet
	Hydrophyllum virgianum	Virginia Waterleaf

Notes: Closed canopy oak community with absolute understory domination by Common Buckthorn and Tartarian Honeysuckle. Easy access and high visibility would make this a relatively straightforward restoration area.

Natural Polygon ID	2B	MLCCS Code	61540
Community Description	Wet Meadow-Seasonally Flooded	Quality Ranking	D
Field Check Level	4	Invasives	406-4, 412-4
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Salix nigra*	Black Willow
Ground	*Phalaris arundinacea*	Reed Canary Grass
	Acorus calamus	Sweet Flag
	Alysma subcordatum	Water Plantain
	Asclepias incarnata	Marsh Milkweed
	Carex debilis	Weak Sedge
	Carex languinosa	Woolly Sedge
	Cyperus esculentus	Cocoa cyperus
	Impatiens capensis	Spotted Touch-me-not
	Iris Versicolor	Northern Blue Flag Iris
	Juncus effusus	Soft Rush
	Juncus tenuis	Path Rush
	Lycopus americanus	Cut-leaved Bugleweed
	Scirpus pungens	Three Square

Notes: Disturbed wetland with 1/2 native plants component. Old railroad ditch has open water in deepest portion with diverse Woolly sedge dominated community at margins between water and Cattail/Reed Canary Grass area. Reed Canary and Cattails are dominant where sediment from Ski Jump slopes are heaviest.

Natural Polygon ID	2C	MLCCS Code	61100
Community Description	Mesic Tallgrass Prairie	Quality Ranking	D
Field Check Level	4	Invasives	409-2
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Populus tremuloides*	Quaking Aspen
	Acer negundo	Boxelder
Shrub	*Lonicera tatarica*	Tartarian Honeysuckle
	Acer ginnala	Amur Maple
	Rhus glabra	Smooth Sumac
	Cornus racemosa	Gray Dogwood
Ground	*Euphorbia esula*	Leafy Spurge
	Poa pratensis	Kentucky Bluegrass
	Solidago rigida	Stiff Goldenrod
	Solidago speciosa	Showy Goldenrod
	Solidago canadensis	Canada Goldenrod
	Lithospermum canescens	Hoary Puccoon
	Rhus radicans	Poison Ivy
	Schizachyrium scoparium	Little Bluestem
	Andropogon gerardii	Big Bluestem
	Sorghastrum nutans	Indian Grass
	Carex richardsonii	Richardson's Sedge
	Lespedeza capitata	Round Headed Bush Clover
	Monarda fistulosa	Wild Bergamot

Notes: Restored/maintained prairie with encroachment by shrub and trees species. Composition dominated by native species, though Kentucky Bluegrass present and common throughout.

Natural Polygon ID	2D	MLCCS Code	61620
Community Description	Mixed emergent marsh	Quality Ranking	D
Field Check Level	3	Invasives	412-4
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Shrub	*Acer ginella*	Amur Maple
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Carex lacustris	Lake sedge
	Carex stipata	Awl-fruited sedge
	Juncus effusus	Soft Rush
	Onoclea sensibilis	Sensitive Fern
	Phalaris arundinacea	Reed Canary Grass
	Typha x glauca	Hybrid Cattail
	Urtica dioica	Stinging Nettle

Notes: Tussock Sedge dominated wetland surrounded by development and roadway construction. Reed Canary Grass beginning to dominate though Tussock Sedge and patches of Sensitive Fern hanging on. Drainageway runs through site linking development with MnDOT stormwater systems.

Natural Polygon ID	2E	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-5
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Prunus serotina*	Black Cherry
	Quercus alba	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
Subcanopy	*Populus tremuloides*	Quaking Alpen
	Prunus serotina	Black Cherry
	Rhamnus cathartica	Common Buckthorn
	Ulmus americana	American Elm
Shrub	*Fraxinus pennsylvanica*	Green Ash
	Prunus virginiana	Common Chokecherry
	Rhamnus cathartica	Common Buckthorn

Natural Polygon ID	2E	**MLCCS Code**	32113
Ground	*Acer negundo*	Boxelder	
	Aquilegia canadensis	Wild Columbine	
	Aralia nudicaulus	Wild Sarsaparilla	
	Arisaema triphyllum	Jack-in-the-pulpit	
	Athyrium felix-femina	Lady Fern	
	Carex - ovales type	An Ovales type sedge	
	Carex gracillima	Graceful Sedge	
	Carex pennsylvanica	Sun Loving Sedge	
	Fraxinus pennsylvanica	Green Ash	
	Galium aparine	Cleavers	
	Galium boreale	Northern bedstraw	
	Geranium maculatum	Wild Geranium	
	Maianthemum canadense	Canada May Flower	
	Osmunda claytoniana	Interrpted Fern	
	Parthenocicus inserta	Woodbine	
	Poa pratensis	Kentucky Bluegrass	
	Polyonatum biflorum	Giant Solomon's Seal	
	Rhamnus cathartica	Common Buckthorn	
	Ribes cynosbati	Prickley Gooseberry	
	Smilacina racemosa	False Solomon's seal	
	Streptopus amplexifolius	Clasping leaved Twistedstalk	
	Thalictrum dioicum	Early Meadow-rue	
	Thalictrum thalictroides	Flase Meadow Rue	
	Toxicodendron radicans	Common Poison Ivy	
	Triosteum aurantiacum	Early Horse Gentian	
	Vitis riparia	riverbank Grape	

Notes: Large, and mixed quality Oak Forest with heavy buckthorn invasion throughout. Oaks dominant in closed canopy. Steep slopes provide microhabitats for moist species Interrupted Fern and Wet Sedges, though upland, dry oak forest dominates. Oaks generally tall, forest grown trees. Trails and associated erosion common throughout.

Natural Polygon ID	2F	MLCCS Code	61110
Community Description	Mesic Prairie	Quality Ranking	D
Field Check Level	3	Invasives	409-3,413-2
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Picea pungens*	Colorado Blue Spruce
	Pinus resinosa	Red Pine
	Fraxinus pennsylvanica	Green Ash
Ground	*Poa pratensis*	Kentucky Bluegrass
	Bromus inermis	Smooth Brome
	Andropogon gerardii	Big Bluestem
	Schizachyrium scoparium	Little Bluestem
	Sorghastrum nutans	Indian Grass
	Panicum oligosanthes(cf.)	Scribner's Panic Grass
	Rudbeckia hirta	Black Eyed Susan
	Medicago sativa	Alfalfa
	Antennaria neglecta	Field Pussytoes
	Melilotus sp.	Sweet Clover
	Asclepias syriaca	Common Milkweed
	Potentilla sp.	Potentilla
	Verbascum thapsus	Mullien

Notes: Prairie restoration dominated by tall grasses at the edge of city park. Big and Little Bluestem dominant. This is a planted/maintained prairie with natives dominant. Kentucky Bluegrass common throughout, though this and other non-native species are not dominant.

Natural Polygon ID	2G	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	D
Field Check Level	4	Invasives	406-3, 412-3
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Ground	*Scirpus fluviatalis*	River Bulrush
	Carex languinosa	Woolly Sedge
	Phalaris arundinacea	Reed Canary Grass
	Carex lupulina (cf.)	Hop umbrella sedge
	Alisma subcordatum	Heart-leaved Water Plantain

Notes: Heavily sedimented stormwater wetland with River Bulrush dominant in center, and at the margins of sediment load. Mixed Cattail and Woolly Sedge dominate margins. Deep basin located within mature oak forest has two stormwater inlets. One from road is culvert with riprap and obvious road sediment, other is deepening ravine with engineered outlet at top of slope and deeply eroding portion through forest.

Natural Polygon ID	2H	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5
Surveyor	TR	Date	5/30/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus alba	White Oak
	Populus tremuloides	Quaking Alpen
	Quercus rubra	Red Oak
Subcanopy	*Populus tremuloides*	Quaking Alpen
	Ulmus americana	American Elm
	Acer negundo	Boxelder
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Fraxinus pennsylvanica	Green Ash
	Prunus virginiana	Common Chokecherry
Ground	*Acer negundo*	Boxelder
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex - ovales type	An Ovales type sedge
	Carex gracillima	Graceful Sedge
Ground	*Carex pennsylvanica*	Sun Loving Sedge

	Carex rosea	Starry Sedge
	Geranium maculatum	Wild Geranium
	Parthenocicus inserta	Woodbine
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common Buckthorn
	Vitis riparia	riverbank Grape

Notes: Mesic oak forest on steep slopes. Canopy dominated by large mixed oak forest community with tall forest grown trees and scattered open grown oaks. Highly disturbed by erosion, stormwater management pracitces, paved trail and abundant, well established Common Buckthorn.

Natural Polygon ID	2I	**MLCCS Code**	32112
Community Description	Oak Forest - Mesic subtype	**Quality Ranking**	D
Field Check Level	4	**Invasives**	408-5, 411-3
Surveyor	TR	**Date**	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus rubra	Red Oak
	Populus deltoides	Cottonwood
	Carya cordiformis	Bitternut Hickory
Subcanopy	*Acer negundo*	Boxelder
	Carya cordiformis	Bitternut Hickory
	Populus deltoides	Cottonwood
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
	Rhamnus cathartica	Common Buckthorn
	Ulmus americana	American Elm
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Rubus idaeus	Red Raspberry
	Sambucus canadensis	Common Elder
Ground	*Acer negundo*	Boxelder
	Circaea lutetiana	Common Enchanter's Nightshade
	Alliaria petiolata	Garlic Mustard
	Arisaema triphyllum	Jack-in-the-pulpit
	Atherium felix-femina	Lady Fern
Ground	*Carex* - ovales type	An Ovales type sedge
	Carex gracillima	Graceful Sedge

Natural Polygon ID	2I	**MLCCS Code**	32112
	Carex pennsylvanica	Sun Loving Sedge	
	Carex rosea	Starry Sedge	
	Leonurus cardiaca	Motherwort	
	Osmunda claytoniana	Interrupted Fern	
	Geranium maculatum	Wild Geranium	
	Parthenocicus inserta	Woodbine	
	Pilea pumila	Dwarf Clearweed	
	Rhamnus cathartica	Common Buckthorn	
	Sambucus canadensis	Common Elder	
	Smilacina racemosa	False Solomon's Seal	
	Toxicodendron radicans	Poison Ivy	
	Vitis riparia	riverbank Grape	

Notes: Mesic oak forest on steep slopes. Managed as open public space. Deeply cut, highly eroded ravines present throughout coming from development areas on top of slope. Trails with wide canopy openings very weed. Consider tree planting to reclose canopy along trails. Many areas of past excavation and erosion. Overstory is a diverse mix including a few bitternut hickory. Understory dominated by ash, boxelder and elm with oaks common.

Natural Polygon ID	2J	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 411-2
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus rubra	Red Oak
	Populus deltoides	Cottonwood
	Tilia americana	Basswood
Subcanopy	*Acer negundo*	Boxelder
	Populus deltoides	Cottonwood
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
	Prunus serotina	Black Cherry
	Tilia americana	Basswood
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Rubus idaeus	Red Raspberry
	Sambucus canadensis	Common Elder
Ground	*Acer negundo*	Boxelder
	Circaea lutetiana	Common Enchanter's Nightshade
	Alliaria petiolata	Garlic Mustard
	Arisaema triphyllum	Jack-in-the-pulpit
	Atherium felix-femina	Lady Fern
	Carex - ovales type	An Ovales type sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex rosea	Starry Sedge
	Leonurus cardiaca	Motherwort
	Geranium maculatum	Wild Geranium
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Sambucus canadensis	Common Elder
	Smilacina racemosa	False Solomon's Seal
	Toxicodendron radicans	Poison Ivy

Notes: Mesic oak forest on steep slopes located between backyards. Relatively wide stand with variable use (and misuse). Mix of open and canopy grown oaks dominate overstory. Buckthorn heavy.

Natural Polygon ID	2K	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 411-2
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus rubra	Red Oak
	Populus deltoides	Cottonwood
	Tilia americana	Basswood
Subcanopy	*Acer negundo*	Boxelder
	Populus deltoides	Cottonwood
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
Subcanopy	*Quercus rubra*	Red Oak
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Rubus idaeus	Red Raspberry
	Sambucus canadensis	Common Elder
Ground	*Acer negundo*	Boxelder
	Circaea lutetiana	Common Enchanter's Nightshade
	Alliaria petiolata	Garlic Mustard
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex pennsylvanica	Sun Loving Sedge
	Geranium maculatum	Wild Geranium
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Toxicodendron radicans	Poison Ivy

Notes: Very narrow strip of Mesic Oak forest between backyards. Privately owned land is mostly very poor quality forest with existing remnant canopy.

Natural Polygon ID	2L	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 411-3
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus rubra	Red Oak
	Populus deltoides	Cottonwood
	Tilia americana	Basswood
Subcanopy	*Acer negundo*	Boxelder
	Populus deltoides	Cottonwood
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Rubus idaeus	Red Raspberry
	Syringa vulgaris	Common Lilac
	Sambucus canadensis	Common Elder
Ground	*Acer negundo*	Boxelder
	Circaea lutetiana	Common Enchanter's Nightshade
	Alliaria petiolata	Garlic Mustard
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex pennsylvanica	Sun Loving Sedge
	Geranium maculatum	Wild Geranium
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Toxicodendron radicans	Poison Ivy

Notes: Very narrow strip of Mesic Oak forest between backyards. Very low quality. Abundant buckthorn.

Natural Polygon ID	4A	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	D
Field Check Level	4	Invasives	412-3
Surveyor	TR	Date	5/22/2007

Shrubs	*Salix exigua*	Sandbar Willow
	Salix discolor	Pussy Willow
	Rhamnus frangula	Glossy Buckthorn
Ground	*Carex lacustris*	Lake Sedge
	Carex stricta	Tussock Sedge
	Lythrum salicaria	Purple Loosestrife
	Phalaris arundinacea	Reed Canary Grass
	Typha x glauca	Hybrid Cattail
	Urtica dioica	Stinging Nettle

Notes: Poor quality sedge meadow with sandbar willow component. Lots of Reed Canary Grass and purple loosestrife throughout.

Natural Polygon ID	4B	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	C
Field Check Level	4	Invasives	412-3
Surveyor	TR	Date	5/22/2007

Shrubs	*Acer ginnela*	Amur Maple
	Cornus serecia	Red Osier Dogwood
	Rhamnus frangula	Glossy Buckthorn
	Salix bebbiana	Bebb's Willow
	Salix discolor	Pussy Willow
	Salix exigua	Sandbar Willow
Shrubs	*Salix nigra*	Black Willow
	Salix petiolaris	Slender Willow
Ground	*Carex lacustris*	Lake Sedge
	Carex stricta	Tussock Sedge
	Lythrum salicaria	Purple Loosestrife
	Phalaris arundinacea	Reed Canary Grass
	Typha x glauca	Hybrid Cattail
	Urtica dioica	Stinging Nettle
	Carex utriculata	Common Yellow Lake Sedge
	Carex vulpinoidea	Fox Sedge
	Aslepias incarnata	Marsh Milkweed
	Onoclea sensibilis	Sensitive Fern
	Theliptis palustris	Marsh Fern
	Campanula aparinoides	Marsh Bellflower
	Calamagrostis canadensis	Canada Bluejoint
	Polygonum amphibium	Water Smartweed

Notes: Moderate Quality Willow swamp with diverse ground layer and limited invasive species. Diverse willow community maintains diversity of understory in wet, and partially shaded conditions. Adjacent to ditched portion of Nine Mile Creek within larger wetland complex.

Natural Polygon ID	5B	**MLCCS Code**	52420
Community Description	Wet Meadow - Shrub Subtype	**Quality Ranking**	C/D
Field Check Level	4	**Invasives**	412-3, 406-3
Surveyor	TR	**Date**	5/22/2007
Shrubs	*Cornus serecia*	Red Osier Dogwood	
	Fraxinus pennsylvanica	Green Ash	
	Rhamnus frangula	Glossy Buckthorn	
	Salix amygdaloides	Peach Leaved Willow	
	Salix discolor	Pussy Willow	
	Salix pedicellaris	Bog Willow	
Ground	*Calamagrostis canadensis*	Canada Bluejoint	
	Carex stricta	Tussock Sedge	
	Carex vulpinoidea	Fox Sedge	
	Circium muticum	Swamp Thistle	
	Impatiens capensis	Spotted Touch-me-not	
	Lythrum salicaria	Purple Loosestrife	
	Phalaris arundinacea	Reed Canary Grass	
	Theliptis palustris	Marsh Fern	
	Typha x glauca	Hybrid Cattail	
	Urtica dioica	Stinging Nettle	
	Verbena hastata	Blue Vervain	

Notes: Remnant Shrub Swamp with Reed Canary Grass/Cattail wetland on one side and thick buckthorn dominated woods on the upland side. Shade and hydrology presumably provide conditions for Tussock Sedge, Fox Sedge and Canada Bluejoint to persist as dominants.

Natural Polygon ID	9A	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 411-4
Surveyor	FH	Date	8/1/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
Subcanopy	*Acer negundo*	Box elder
	Fraxinus pennsylvanica	Green ash
	Rhamnus cathartica	Common buckthorn
	Tilia americana	Basswood
Ground	*Alliaria petiolata*	Garlic mustard
	Phryma leptostachya	Lopseed
	Smilacina racemosa	Common false Solomon's seal
	Solidago flexicaulis	Zigzag goldenrod

Notes: Large, scattered open grown Bur oaks in a matrix of young Green ash, Box elder, and Basswood. Common buckthorn is found throughout the site.

Natural Polygon ID	9B	MLCCS Code	32220
Community Description	Lowland Hardwood	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 411-4
Surveyor	FH	Date	8/1/2006

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus nigra	Black ash
	Fraxinus pennsylvanica	Green ash
	Populus deltoides var. occidentalis	Cottonwood
	Tilia americana	Basswood
Subcanopy	*Ulmus americana*	American elm
Ground	*Aster ontarionis*	Ontario aster
	Equisetum hyemale var. affine	Tall scouring rush
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Pilea fontana	Black-fruited clearweed
	Ribes sp.	Gooseberry
	Myosotis sp.	Forget-me-not

Notes: Ravine bottom and northern slope dominated by large Basswoods, Hackberries, and Box elders with Gooseberries dominating the ground-cover. Creek bottom upstream from the "Bass ponds" dominated by Black ash, Basswood, and Cottonwoods. Ground cover dominated by Spotted touch-me-not, and Forget-me-nots with Wood nettle, Black-fruited clearweed, Ontario aster, and Tall scouring rush found in abundance.

Natural Polygon ID	10A	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	DC
Field Check Level	3	Invasives	408-5, 410-2
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Canopy	*Celtis occidentalis*	Hackberry
	Fraxinus pennsylvanica	Green ash
	Picea glauca	White spruce
	Pinus resinosa	Red pine
	Populus deltoides var. occidentalis	Cottonwood
	Prunus serotina	Black cherry
	Quercus ellipsoidalis	Northern pin oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Acer negundo*	Box elder
	Fraxinus pennsylvanica	Green ash
	Ostrya virginiana	Ironwood
	Prunus serotina	Black cherry
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
	Prunus serotina	Black cherry
	Rhamnus cathartica	Common buckthorn
	Ribes missouriense	Missouri gooseberry
	Sambucus racemosa	Red-berried elder
	Zanthoxylum americanum	Prickly ash
Ground	*Arisaema triphyllum*	Jack-in-the-pulpit
	Carex blanda	Charming sedge
	Carex rosea	Starry sedge
	Carex tenera	Marsh straw sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Hackelia virginiana	Virginia stickseed
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Leonurus cardiaca	Common motherwort
	Menispermum canadense	Canada moonseed
	Parthenocissus vitacea	Virginia creeper
	Viola sororia	Common blue violet

Notes: Overgrown oak woodland dominated by large open-grown, interrupted to continuous canopy of Bur oaks. High subcanopy comprised primarily of Box elders. Dense shrub layer dominated by Common buckthorn and sparse herbaceous layer with numerous spots of bare soil.

Natural Polygon ID	10B	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D/C
Field Check Level	3	Invasives	408-5, 410-2
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Canopy	*Celtis occidentalis*	Hackberry
	Fraxinus pennsylvanica	Green ash
	Picea glauca	White spruce
	Pinus resinosa	Red pine
	Populus deltoides	Cottonwood
	Prunus serotina	Black cherry
	Quercus ellipsoidalis	Northern pin oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Acer negundo*	Box elder
	Fraxinus pennsylvanica	Green ash
	Ostrya virginiana	Ironwood
	Prunus serotina	Black cherry
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
	Prunus serotina	Black cherry
	Rhamnus cathartica	Common buckthorn
	Ribes missouriense	Missouri gooseberry
	Sambucus racemosa	Red-berried elder
	Zanthoxylum americanum	Prickly ash
Ground	*Arisaema triphyllum*	Jack-in-the-pulpit
	Carex blanda	Charming sedge
	Carex rosea	Starry sedge
	Carex tenera	Marsh straw sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Hackelia virginiana	Virginia stickseed
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Leonurus cardiaca	Common motherwort
	Menispermum canadense	Canada moonseed
	Parthenocissus vitacea	Virginia creeper
	Viola sororia	Common blue violet

Notes: Overgrown oak woodland dominated by large open-grown, interrupted to continuous canopy of Bur oaks. High subcanopy comprised primarily of Box elders. Dense shrub layer dominated by Common buckthorn and sparse herbaceous layer with numerous spots of bare soil.

Natural Polygon ID	10C	MLCCS Code	61620
Community Description	Mixed emergent marsh	Quality Ranking	B
Field Check Level	3	Invasives	
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake sedge
	Carex stipata	Awl-fruited sedge
	Cicuta bulbifera	Bulb-bearing water hemlock
	Eleocharis palustris	Red-stalked spikerush
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus acutus	Hardstem bulrush
	Scirpus fluviatilis	River bulrush
	Sparganium eurycarpum	Giant bur reed
	Zizania sp.	Wild rice

Notes: Outermost zone of marsh dominated by Giant bur reed with Hardstem bulrush, River bulrush, and Broad-leaved arrowhead found throughout. Wild rice found within the marsh and extending into the lake.

Natural Polygon ID	10D	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
Shrubs	*Rhamnus cathartica*	Common buckthorn
Ground	*Carex amphibola*	Ambiguous sedge
	Leersia virginica	White grass

Notes: Narrow zone along marsh with Silver maple comprising the canopy and dense thickets of Common buckthorn found throughout.

Natural Polygon ID	10G	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-2, 412-2
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green ash
	Salix nigra	Black willow
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Viburnum trilobum	Highbush cranberry
Ground	*Apios americana*	Groundnut
	Carex lacustris	Lake sedge
	Impatiens capensis	Spotted touch-me-not
	Iris virginica var. shrevei	Southern blue flag
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed

Notes: Seepage swamp dominated by large, scattered, Green ash without the presence of Black ash. Water table was below the surface and seepage resulted in a small stream. Sparse subcanopy with ground cover consisting of dense, tall Spotted touch-me-not and patches of Reed canary grass.

Natural Polygon ID	10H	MLCCS Code	32112
Community Description	Oak forset mesic subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-5, 410-2, 411-3, 420-2
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Juglans cinerea	Butternut
	Populus deltoides var. Cottonwood	Cottonwood
	Quercus rubra	Northern red oak
	Robinia pseudoacacia	Black locust
	Tilia americana	Basswood
	Ulmus rubra	Red elm
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus nigra	Black ash
	Tilia americana	Basswood
	Ulmus americana	American elm
	Ulmus rubra	Red elm
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
	Rhamnus cathartica	Common buckthorn
Ground	*Alliaria petiolata*	Garlic mustard
	Carex blanda	Charming sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Menispermum canadense	Canada moonseed
	Teucrium canadense	Germander
	Tilia americana	Basswood
	Zizia aurea	Golden alexanders

Notes: Mesic oak forest with interrupted to contiguous canopy dominated by Green ash, Basswood, and Red elm with occassional large Northern red oaks, Butternuts, Cottonwoods, and Box elders. Old cattle fence present.

Natural Polygon ID	10I	MLCCS Code	61620
Community Description	Mixed emergent marsh	Quality Ranking	C
Field Check Level	3	Invasives	402-2, 406-2
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Ground	*Scirpus fluviatilis*	River bulrush
	Lythrum salicaria	Purple loosestrife
	Sagittaria latifolia	Broad-leaved arrowhead
	Typha angustifolia	Narrow-leaved cattail

Notes: Dense marsh of River bulrush, with occassinal individuals of Purple loosestrife and Broad-leaved arrowhead. Low density of Narrow-leaved cattail.

Natural Polygon ID	10J	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	D
Field Check Level	3	Invasives	412-6
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black ash
Ground	*Phalaris arundinacea*	Reed canary grass

Notes: Black ash swamp with high levels of groundwater discharge. Ground-cover almost completely dominated by Reed canary grass.

Natural Polygon ID	10L	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	C
Field Check Level	3	Invasives	408-5, 410-2, 411-5, 416-2
Surveyor	FH	Date	7/18/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus ellipsoidalis	Northern pin oak
Subcanopy	*Acer negundo*	Box elder
	Fraxinus pennsylvanica	Green ash
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
	Ulmus pumila	Siberian elm
	Ulmus rubra	Red elm
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
	Prunus virginiana	Chokecherry
	Rhamnus cathartica	Common buckthorn
	Ribes missouriense	Missouri gooseberry
Ground	*Hackelia virginiana*	Virginia stickseed
	Actaea rubra	Red baneberry
	Alliaria petiolata	Garlic mustard
	Arctium minus	Common burdock
	Aster cordifolius	Heart-leaved aster
	Campanula americana	Tall bellflower
	Carex blanda	Charming sedge
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Carex rosea	Starry sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Daucus carota	Queen Anne's lace
	Elymus sp.	Wild rye
	Festuca subverticillata	Nodding fescue
	Osmorhiza claytonii	Clayton's sweet cicely
	Phryma leptostachya	Lopseed

Notes: Overgrown oak-woodland dominated by large, open-grown Bur oaks. Subcanopy dominated by Ironwood. Dense shrubcover dominated by Common buckthorn and Missouri gooseberry. Moderately-high infestation of garlic mustard and appears to have been grazed heavily many years ago. Old roads present.

Natural Polygon ID	10M	**MLCCS Code**	61620
Community Description	Mixed emergent marsh	**Quality Ranking**	C
Field Check Level	3	**Invasives**	412-3
Surveyor	TR	**Date**	8/10/2006

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake sedge
	Leerzia oryzoides	Rice Cut grass
	Phalaris arundinacea	Reed Canary Grass
	Polygonum amphibium	Water Smartweed
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus fluviatalis	River bulrush
	Sparganium eurycarpum	Giant Bur-reed
	Impatiens capensis	Spotted Touch-me-not
	Sium suave	Water parsnip
	Carex stricta	Tussock Sedge
	Polygonum hydropiper	Marsh Waterpepper
	Cicuta bulbifera	Bulb-bearing Water Hemlock
	Cyperus esculentus	Yellow Nut-sedge
	Lycopus americanus	Cut-leaved Bugleweed
	Typha x glauca	Hybrid Cattail

Notes: River Bulrush dominated emergent wetland in the flooded portion of Minnesota River backwater lake.

Natural Polygon ID	10O	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	D
Field Check Level	4	Invasives	412-4, 413-3
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Boxelder
	Acer sacharinum	Silver Maple
	Fraxinus pennsylvanica	Green Ash
	Populus deltoides	Cottonwood
Subcanopy	*Ulmus americana*	American Elm
	Acer negundo	Boxelder
	Fraxinus pennsylvanica	Green Ash
Shrubs	*Sambucus canadensis*	Common Elder
	Vitis riparia	Riverbank Grape
Ground	*Urtica dioica*	Stinging nettle
	Arcteum minus	Common Burdock
	Bromus inermis	Smooth Brome
	Campanula americana	Tall Bellflower
	Laportea canadensis	Wood Nettle
	Phalaris arundinacea	Reed Canary Grass
	Pilea pumila	Dwarf Clearweed
	Rudbeckia laciniata	Tall Coneflower

Notes: Low quality, open floodplain forest with thick ground layer vegetation dominated by Reed Canary Grass and Smooth Brome.

Natural Polygon ID	10N	MLCCS Code	61820
Community Description	Mixed emergent marsh - permanately flooded	Quality Ranking	C
Field Check Level	2	Invasives	
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Ground	*Sagittaria latifolia*	Broad-leaved arrowhead
	Scirpus fluviatalis	River bulrush

Notes: Semipermanently flooded River Bulrush dominated emergent margin of Minnesota River backwater lake.

Natural Polygon ID	10Q	MLCCS Code	61720
Community Description	Mixed emergent marsh - Intermittently Exposed	Quality Ranking	B
Field Check Level	3	Invasives	412-3, 411-2
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake sedge
	Carex stricta	Tussock Sedge
	Cicuta bulbifera	Bulb-bearing Water Hemlock
	Cyperus esculentus	Yellow Nut-sedge
	Equisetum fluviatale	Water horsetail
	Impatiens capensis	Spotted Touch-me-not
	Leerzia oryzoides	Rice Cut grass
	Lycopus americanus	Cut-leaved Bugleweed
	Phalaris arundinacea	Reed Canary Grass
	Polygonum amphibium	Water Smartweed
	Polygonum hydropiper	Marsh Waterpepper
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus fluviatalis	River bulrush
	Sium suave	Water parsnip
	Sparganium eurycarpum	Giant Bur-reed
	Typha x glauca	Hybrid Cattail
	Phragmites australis	Giant Reed Grass
	Salix nigra	Black Willow
	Carex utriculata	Beaked Sedge
	Scuttelaria laterifolia	Mad dog Skullcap
	Mentha arvensis	Common Mint
	Zizania palustris	Wild Rice
	Iris versicolor	Northern Blue Flag Iris
	Scirpus validus	Soft-stemmed Bulrush

Notes: Emergent wetland with large Wild Rice component.

Natural Polygon ID	10R	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	D
Field Check Level	4	Invasives	412-4, 413-3
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Boxelder
	Acer sacharinum	Silver Maple
	Fraxinus pennsylvanica	Green Ash
	Populus deltoides	Cottonwood
Subcanopy	*Ulmus americana*	American Elm
	Acer negundo	Boxelder
	Fraxinus pennsylvanica	Green Ash
Shrubs	*Sambucus canadensis*	Common Elder
	Vitis riparia	Riverbank Grape
Ground	*Urtica dioica*	Stinging nettle
	Arcteum minus	Common Burdock
	Bromus inermis	Smooth Brome
	Campanula americana	Tall Bellflower
	Laportea canadensis	Wood Nettle
	Phalaris arundinacea	Reed Canary Grass
	Pilea pumila	Dwarf Clearweed
	Rudbeckia laciniata	Tall Coneflower

Notes: Low quality, open floodplain forest with thick ground layer vegetation dominated by Reed Canary Grass and Smooth Brome.

Natural Polygon ID	11A	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Boxelder
	Acer sacharinum	Silver Maple
	Fraxinus pennsylvanica	Green Ash
	Populus deltoides	Cottonwood
	Ulmus americana	American Elm
Subcanopy	*Ulmus americana*	American Elm
	Vitis riparia	Riverbank Grape
Shrubs	*Rhamnus cathartica*	Common Buckthorn
Ground	*Amphicarpa bracteata*	Hog Peanut
	Arcteum minus	Common Burdock
	Aster sp.	A species of Aster
	Campanula americana	Tall Bellflower
	Carex emoryi	Emory's Sedge
	Cyperus esculentus	Cocoa cyperus
	Elymus virginicus	Virginia Wild Rye
	Galeopsis tetrahit	Hemp Nettle
	Helenium autumnale	Sneezeweed
	Laportea canadensis	Wood Nettle
	Leersia virginiana	White Grass
	Phalaris arundinacea	Reed Canary Grass
	Pilea pumila	Dwarf Clearweed
	Rudbeckia laciniata	Tall Coneflower
	Setaria viridis	Green Foxtail
	Solidago canadensis	Canada Goldenrod
	Ulmus americana	American Elm

Notes: Floodplain forest dominated by cottonwoods. Bisected by two former railroad berms. Berms and forest edges dominated by Wood Nettle and Burdock. Ground layer nearly continuous Wood nettle during August field survey.

Natural Polygon ID	11B	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver Maple
	Fraxinus pennsylvanica	Green Ash
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Ulmus americana	American Elm
	Vitis riparia	Riverbank Grape
Shrubs	*Acer saccharinum*	Silver Maple
Ground	*Laportea canadensis*	Wood Nettle
	Leersia virginiana	White Grass
	Pilea pumila	Dwarf Clearweed
	Rudbeckia laciniata	Tall coneflower
	Vitis riparia	Riverbank Grape

Notes: Silver maple floodplain forest. Overstory nearly pure Silver Maple. Understory dominated by Green ash, American Elm and Box elder. Ground layer continuous Wood nettle.

Natural Polygon ID	11C	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	B
Field Check Level	3	Invasives	412-3
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Ground	*Boltonia asteroides*	Boltonia
	Carex lacustris	Lake sedge
	Cicuta bulbifera	Bulb-bearing Water Hemlock
	Glyceria grandis	Tall Manna Grass
	Helenium autumnale	Sneezeweed
	Impatiens capensis	Spotted Touch-me-not
	Iris versicolor	Northern Blue Flag Iris
	Leerzia oryzoides	Rice Cut grass
	Lycopus americanus	Cut-leaved bugleweed
	Mentha arvensis	Common mint
	Mimulus ringens	Blue Monkey flower
	Phalaris arundinacea	Reed Canary Grass
	Physostegia virginiana	Obedient plant
	Pilea pumila	Dwarf Clear weed
	Poa palustris	Fowl bluegrass
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus acutus	Hardstem bulrush
	Scirpus fluviatalis	River bulrush
	Sonchus asper	Spiny sow thistle
	Sparganium americanum	Nuttall's Bur reed
	Stachys palustris	Marsh hedge-nettle
	Typha x glauca	Hybrid Cattail
	Verbena hastata	Blue vervain
	Vernonia fasciculata	Bunched Ironweed
	Zizania palustris	Wild Rice

Notes: Good quality, large wetland located within the Minnesota River floodplain. Center dominated by River bulrush. Margins contain a very diverse mix of floodplain and emergent species. Invasive species Reed Canary and Hybrid cattails present but limited.

Natural Polygon ID	11D	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	2	Invasives	420-2, 412-2
Surveyor	TR	Date	8/10/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver Maple
	Populus deltoides	Cottonwood
Subcanopy	*Ulmus americana*	American Elm
	Acer negundo	Box elder
	Fraxinus pennsylvanica	Green Ash
	Robinia pseudoacacia	Black Locust
	Vitis riparia	Riverbank Grape
Ground	*Laportea canadensis*	Wood Nettle
	Pilea pumila	Dwarf Clearweed
	Arcteum minus	Common Burdock
	Phalaris arundinacea	Reed canary grass
	Rudbeckia laciniata	Tall coneflower

Notes: Dense Green ash dominated floodplain forest with single aged overstory. Ground layer shows evidence of frequent flooding with minimal vegetation and limited shrub layer.

Natural Polygon ID	12A	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	B
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Betula papyrifera*	Paper Birch
	Quercus rubra	Red Oak
	Quercus alba	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
Subcanopy	*Fraxinus pennsylvanica*	Green Ash
	Ostrya virginiana	Ironwood
	Ulmus americana	American Elm
	Cornus alternifolia	Alternate Leaved Dogwood
	Tilia americana	Basswood
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Fraxinus pennsylvanica	Green Ash
	Prunus virginiana	Chokecherry
	Ribes cynosbati	Prickly Gooseberry
	Rubus idaeus	Common Red Raspberry
	Cornus racemosa	Gray Dogwood
	Cornus alternifolia	Alternate Leaved Dogwood
	Ribes americanum	Black Currant
Ground	*Arisaema triphyllum*	Jack-in-the-pulpit
	Athyrium felix-femina	Lady Fern
	Carex blanda	Charming Sedge
	Carex gracillima	Graceful Sedge
	Galium aparine	Cleavers
	Geranium maculatum	Wild Geranium
	Maianthemum canadense	Canada May Flower
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Ribes cynosbati	Prickley Gooseberry
	Toxicodendron radicans	Common Poison Ivy
	Thalictrum thalictroides	Rue anemone
	Solidago flexicaulis	Zigzag Goldenrod
	Vitis riparia	Riverbank Grape
	Actea rubra	Red Baneberry
	Carex pennsylvanica	Sun Loving Sedge

Notes: Oak forest maintained by Three Rivers Park District. Sorthern upland portion has very little invasive species, though Buckthorn common near lake and in northern portions. Oaks dominate in overstory, though few in understory.

Natural Polygon ID	12B	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	B
Field Check Level	3	Invasives	406-2
Surveyor	TR	Date	7/11/2007

Location	Scientific Name	Common Name
Shrub	*Cornus serecia*	Red Osier Dogwood
	Salix exigua	Sandbar Willow
	Viburnum trilobum	Highbush Cranberry
	Salix amygdaloides	Peach Leaved Willow
	Ulmus rubra	Red Elm
Ground	*Apocynum androsaemifolium*	Spreading Dogbane
	Asclepias incarnata	Marsh Milkweed
	Asclepias syriaca	Common Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Carex (Ovales type)	Ovales Sedge
	Carex lacustris	Lake Sedge
	Carex languinosa	Wooly Sedge
	Juncus tenuis	Path Rush
	Lycopus americanus	Cut-Leaved Bugleweed
	Melilotus alba	White Sweet Clover
	Phalaris arundinacea	Reed Canary Grass
	Rhus glabra	Smooth Sumac
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad Leaved Arrowhead
	Salix exigua	Sandbar Willow
	Scirpus cyperinus	Woolgrass
	Scirpus validus	Soft Stem Bulrush
	Solidago canadensis	Canada Goldenrod
	Typha x glauca	Hybrid Cattail
	Verbena stricta	Blue Vervain
	Carex comosa	Bottlebrush Sedge
	Rosa sp.	Wild Rose
	Anemone canadensis	Canada Anemone
	Iris versicolor	Blue Flag Iris
	Carex bebii	Bebb's Sedge
	Rubus sp.	Blackberry
	Glyceria grandis	Tall Manna Grass
	Polygonum amphibium	Water Smartweed
	Eupatorium perfoliatum	Boneset
	Tradescantia ohiensis	Ohio Spiderwort
	Panicum virgatum	Switchgrass
	Euthamia graminifolis	Grass leaved Goldenrod

Notes: Lakeshore edge maintained though herbicide and planting. Lakeshore edge of good quality. Some Hybrid Cattails and Reed Canary Grass present, but controlled. Reed Canary dieback due to herbicide appears successful/though ongoing. Plants are a mix of upland and wetland species, though mostly wetland species persist. Appears to be planted edge.

Natural Polygon ID	12C	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	C
Field Check Level	2	Invasives	408-4
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Betula papyrifera*	Paper Birch
	Quercus macrocarpa	Bur Oak
	Quercus alba	White Oak
	Juglans nigra	Black Walnut
	Tilia americana	Basswood
	Populus deltoides	Cottonwood
Subcanopy	*Betula papyrifera*	Paper Birch
	Quercus macrocarpa	Bur Oak
	Tilia americana	Basswood
	Ostrya virginiana	Ironwood
	Prunus serotina	Black Cherry
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Cornus racemosa	Gray Dogwood
	Ribes americana	Wild Black Currant
Ground	*Solidago rigida*	Stiff goldenrod
	Rhamnus cathartica	Common Buckthorn
	Carex blanda	Charming Sedge
	Carex ovales type	Ovales Sedge
	Circaea lutetiana	Common Enchanger's Nightshade

Notes: Lowland hardwood forest between Oak Forest and Bush Lake. Three Rivers Park District maintained. Oak forest kept generally clear of invasives, this lowland HW forest has more buckthorn than above. Mix of oaks and wet tolerant tree species.

Natural Polygon ID	12H	MLCCS Code	32112
Community Description	Oak Forest Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-4
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Tilia americana	Basswood
	Betula papyrifera	Paper Birch
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
Subcanopy	*Rhamnus cathartica*	Common Buckthorn
	Acer saccharum	Sugar maple
	Betula papyrifera	Paper Birch
	Quercus rubra	Red Oak
	Tilia americana	Basswood
	Prunus serotina	Black Cherry
Shrub	*Ribes americanum*	Wild Black Currant
	Rubus sp.	Blackberry
	Rhus glabbra	Smooth Sumac
	Rhamnus cathartica	Common Buckthorn
	Rubus idaeus	Red Raspberry
Ground	*Circaea lutetiana*	Common Enchanger's Nightshade
	Parthenocissus inserta	Woodbine
	Quercus alba	White Oak
	Rhamnus cathartica	Common Buckthorn
	Arcteum minor	Common Burdock
	Fragaria sp	Wild Strawberry
	Carex rosea	Starry Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Toxicodendron radicans	Poison Ivy
	Carex tenera	Marsh Straw Sedge
	Maianthemum canadense	Canada mayflower

Notes: Poor quality oak forest with heavy buckthorn. Nice forest grown oak canopy.

Natural Polygon ID	12I	MLCCS Code	32112
Community Description	Oak Forest Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-4, 410-4
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
Subcanopy	*Fraxinus pennsylvanica*	Green Ash
	Prunus serotina	Black Cherry
	Quercus rubra	Red Oak
	Tilia americana	Basswood
	Ulmus americana	American Elm
Shrub	*Cornus racemosa*	Gray Dogwood
	Lonicera tatarica	Tartarian Honeysuckle
	Prunus virginiana	Common Chokecherry
	Rhamnus cathartica	Common Buckthorn
	Zanthoxylum americanum	Prickly Ash
Ground	*Arisaema triphyllum*	Jack-in-the-Pulpet
	Carex ovales type	Ovales Sedge
	Circaea lutetiana	Common Enchanger's Nightshade
	Galium aparine	Cleavers
	Parthenocissus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Actea rubra	Red Baneberry
	Vitis riparia	Riverbank Grape
	Euphorbia esula	Leafy spurge

Notes: Poor quality oak forest with heavy buckthorn throughout. Good regeneration of oaks species in understory with Red Oak and Basswood regeneration dominant. Honeysuckle very heavy throughout. Ground layer diversity minimal, lots of Tartarian Honeysuckle in ground layer.

Natural Polygon ID	12J	MLCCS Code	61451
Community Description	Poor fen sedge subtype	Quality Ranking	A
Field Check Level	4	Invasives	Purple Loosestrife-2
Surveyor	TR	Date	7/1/2007

Canopy	*Betula papyrifera*	Paper Birch
	Acer rubrum	Red Maple
Shrub	*Spiraea tomentosa*	Steeplebush
	Salix pedicellaris	Bog Willow
	Acer ginnala	Amur Maple
	Pinus strobus	White Pine (single)
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Carex (Ovales type)	Ovales Type Sedge
	Carex lacustris	Lake Sedge
	Carex lasiocarpa (cf)	Wiregrass Sedge
	Carex utriculata	Beaked Sedge
	Carex vulpinoidea	Fox Sedge
	Dryopteris cristata	Crested Fern
	Aster novae-angliae	New England Aster
	Glyceria grandis	Tall Manna Grass
	Iris versicolor	Blue Flag Iris
	Lycopus americanus	Cut-leaved Bugleweed
	Phalaris arundinacea	Reed Canary Grass
	Polygonum amphibium	Water Smartweed
	Polygonum hydropiper	Marsh Waterpepper
	Polygonum sagittatum	Arrow-leaved Tearthumb
	Sagittaria latifolia	Broad Leaved Arrowhead
	Lythrum salicaria	Purple Loosestrife
	Sagittaria rigida	Sessile Fruited Arrowhead
	Scirpus fluviatilis	River Bulrush
	Thelyptris palustris	Marsh Fern
	Eupatorium perfoliatum	Boneset
	Lysimachia terrestris	Yellow Loosestrife
	Rumex orbiculatus	Great Water Dock
	Typha latifolia	Broad Leaved Cattail
	Vaccinium macrocarpon	Large Cranberry
	Lycopus virginicus	Virginia bugleweed
	Triadenum fraseri	Marsh St. John's Wort
	Menyanthes trifoliata	Buckbean
	Potentilla palustris	Marsh Cinquefoil
	Eleocharis sp.	Spikerush species
	Eriophorum gracile	Slender Cottongrass
	Osmunda cinnamomea	Cinnamon Fern

Natural Polygon ID	12J	MLCCS Code	61452
	Pogonia ophioglossoides	Rose pogonia	
	Impatiens capensis	Spotted touch-me-not	

Notes: Open fen community located in basin with development and roads at edges. Reed Canary dominant outside of moat, but not common within community. Sphagnum hummocks populated by cranberry. Encroachment by woody species pervasive, but not dominant.

Natural Polygon ID	12K	MLCCS Code	32112
Community Description	Oak Forest Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-4
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus rubra	Red Oak
	Quercus alba	White Oak
Subcanopy	*Fraxinus pennsylvanica*	Green Ash
	Celtis occidentalis	Hackberry
	Ulmus americana	American Elm
	Populus tremuloides	Quaking Aspen
	Tilia americana	Basswood
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Ribes americana	Wild Black Currant
Ground	*Parthenocissus inserta*	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Trillium cernuum	Nodding Trillium
	Galium aparine	Cleavers
	Arisaema triphyllum	Jack-in-the-Pulpet
	Carex ovales type	Ovales Sedge
	Circaea lutetiana	Common Enchanger's Nightshade

Notes: Poor quality oak forest with heavy buckthorn throughout.

Natural Polygon ID	12L	**MLCCS Code**	61820
Community Description	Emergent Marsh - Permanently Flooded	**Quality Ranking**	C
Field Check Level	2	**Invasives**	406-3
Surveyor	TR	**Date**	8/10/2006

Location	Scientific Name	Common Name
Ground	*Sagittaria latifolia*	Broad-leaved arrowhead
	Typha x glauca	Hybrid Cattail
	Glyceria grandis	Tall Manna Grass
	Eleocharis sp	Spikerush
	Phalaris arundinacea	Reed Canary Grass
	Scirpus cyperinus	Woolgrass
	Nymphaea odorata	American White Water Lily
	Scirpus fluviatalis	River bulrush

Notes: Wetland fringe between Reed Canary Grass and open water.

Natural Polygon ID	13A	**MLCCS Code**	61110
Community Description	Mesic Prairie	**Quality Ranking**	C
Field Check Level	3	**Invasives**	Kentucky Bluegrass - 3
Surveyor	TR	**Date**	5/16/2007

Canopy	*Acer negundo*	Boxelder
	Quercus alba	White Oak
Shrub	*Cornus racemosa*	Gray Dogwood
	Rubus ideaus	Red Raspberry
	Rhus glabra	Smooth Sumac
Ground	*Andropogon gerardii*	Big Bluestem
	Schizachyrium scoparium	Little Bluestem
	Sorghastrum nutans	Indian Grass
	Monarda fistulosa	Wild Bergamot
	Solidago canadensis	Canada Goldenrod
	Solidago speciosa	Showy Goldenrod
	Solidago rigida	Stiff Goldenrod
	Toxicodendron radicans	Common Poison Ivy
	Parthenocissus inserta	Woodbine
	Lotus corniculatus	Bird's Foot Trefoil
	Lithospermum canescens	Hoary Puccoon
	Aster cordifolius	Heart leaved Aster
	Sisyrinchium campestre	Field Blue eyed Grass
	Carex richarsonii	Richardson's Sedge
	Asclepias speciosa	Showy Milkweed
	Amorpha canescens	Leadplant
	Lespedeza capitata	Round Headed Bush Clover
	Hypericum pyramidatum	Great St. John's Wort
	Verbascum thapsus	Common Mullein
	Melilotus alba	White Sweet Clover
	Lupinus perennis	Wild Lupine
	Zizia aurea	Golden Alexanders
	Asclepias verticillata	Whorled Milkweed
	Geum triflorum	Prairie Aven
	Geranium maculatum	Wild Geranium
	Antennaria neglecta	Field Pussytoes

Notes: Mesic Prairie restored and maintained by Three Rivers Park District. Large component of Kentucky Bluegrass, but dominated mosty by native species. Fire is used as maintenance tool, and woody invasives confined mostly to edge, or limited in size.

Natural Polygon ID	13B	MLCCS Code	61640
Community Description	Wet Meadow - Semipermanently Flooded	Quality Ranking	C
Field Check Level	3	Invasives	412-4
Surveyor	TR	Date	5/22/2007

Ground	*Carex lacustris*	Lake Sedge
	Carex languinosa	Woolly Sedge
	Phalaris arundinacea	Reed Canary Grass
	Scirpus fluviatalis	River Bulrush
	Iris versicolor	Northern Blue Flag Iris
	Spartina pectinata	Prairie Cordgrass

Notes: Wet meadow basin located within Oak Forest area within Bush Lake Park preserve. Reed Canary common but not dominant. River bulrush and lake sedge dominate.

Natural Polygon ID	13C	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 411-2
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Populus tremuloides*	Quaking Aspen
	Prunus serotina	Black Cherry
	Quercus alba	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
Subcanopy	*Quercus alba*	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
	Populus tremuloides	Quaking Alpen
	Celtis occidentalis	Hackberry
	Prunus serotina	Black Cherry
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Ribes americanum	Black Currant
Ground	*Acer negundo*	Boxelder
	Aralia nudicaulus	Wild Sarsaparilla
	Arisaema triphyllum	Jack-in-the-pulpit
	Athyrium felix-femina	Lady Fern
	Carex blanda	Charming Sedge
	Carex gracillima	Graceful Sedge
	Galium aparine	Cleavers

Natural Polygon ID	13C	**MLCCS Code**	32113

Galium boreale	Northern bedstraw
Geranium maculatum	Wild Geranium
Maianthemum canadense	Canada May Flower
Onoclea sensibiliss	Sensitive Fern
Parthenocicus inserta	Woodbine
Poa palustris	Kentucky Bluegrass
Polyonatum biflorum	Giant Solomon's Seal
Rhamnus cathartica	Common Buckthorn
Ribes cynosbati	Prickley Gooseberry
Smilacina racemosa	False Solomon's seal
Streptopus roseus	riverbank Grape
Thalictrum dioicum	Early Meadow-rue
Trilium cernuum	Nodding Trillium
Toxicodendron radicans	Common Poison Ivy

Notes: Oak forest with open grown oaks dominating canopy. Formerly oak woodland, this is now forest with nearly continuous canopy closure. Understory a mix of quaking aspen and buckthorn. Historically oak savanna due to open grown nature of oaks in overstory. Heavily infested with buckthorn at all strata.

Natural Polygon ID	13D	**MLCCS Code**	61540
Community Description	Wet meadow	**Quality Ranking**	C/D
Field Check Level	4	**Invasives**	412-3
Surveyor	TR	**Date**	5/22/2007

Ground	*Alysma subcordata*	Water Plantain
	Carex lacustris	Lake Sedge
	Carex languinosa	Woolly Sedge
	Carex stricta	Tussock Sedge
	Iris versicolor	Northern Blue Flag Iris
	Juncus effusus	Soft Rush
	Lemna minor	Lesser Duckweed
	Lycopus americanus	Cut-leaved bugleweed
	Phalaris arundinacea	Reed Canary Grass
	Scirpus fluviatalis	River Bulrush
	Sparganium americana	Bur-reed
	Spartina pectinata	Prairie Cordgrass
	Urtica dioica	Stinging Nettle

Notes: Formerly tussock sedge meadow with tussocks now dominated by Reed Canary Grass. Lower and shadier portions dominated by River Bulrush and Lake Sedge.

Natural Polygon ID	13E	MLCCS Code	61640
Community Description	Wet Meadow - Semipermanentlyl Flooded	Quality Ranking	D
Field Check Level	4	Invasives	412-4
Surveyor	TR	Date	5/22/2007

Ground	*Carex lacustris*	Lake Sedge
	Carex languinosa	Woolly Sedge
	Carex stricta	Tussock Sedge
	Iris versicolor	Northern Blue Flag Iris
	Juncus effusus	Soft Rush
	Lemna minor	Lesser Duckweed
	Lycopus americanus	Cut-leaved bugleweed
	Phalaris arundinacea	Reed Canary Grass
	Scirpus fluviatalis	River Bulrush
	Sparganium americana	Bur-reed
	Spartina pectinata	Prairie Cordgrass
	Urtica dioica	Stinging Nettle

Notes: Formerly tussock sedge meadow with tussocks now dominated by Reed Canary Grass at margins. Lower and shadier portions dominated by River Bulrush and Lake Sedge.

Natural Polygon ID	13F	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	D
Field Check Level	4	Invasives	412-4
Surveyor	TR	Date	5/22/2007

Ground	*Carex lacustris*	Lake Sedge
	Carex languinosa	Woolly Sedge
	Carex stricta	Tussock Sedge
	Iris versicolor	Northern Blue Flag Iris
	Juncus effusus	Soft Rush
	Lemna minor	Lesser Duckweed
	Lycopus americanus	Cut-leaved bugleweed
	Phalaris arundinacea	Reed Canary Grass
	Scirpus fluviatalis	River Bulrush
	Sparganium americana	Bur-reed
	Spartina pectinata	Prairie Cordgrass
	Urtica dioica	Stinging Nettle

Notes: Formerly tussock sedge meadow with tussocks now dominated by Reed Canary Grass at margins. Lower and shadier portions dominated by River Bulrush and Lake Sedge.

Natural Polygon ID	13G	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 411-2
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Populus tremuloides*	Quaking Aspen
	Prunus serotina	Black Cherry
	Quercus alba	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
Subcanopy	*Quercus alba*	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
	Populus tremuloides	Quaking Alpen
	Celtis occidentalis	Hackberry
	Prunus serotina	Black Cherry
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Ribes americanum	Black Currant
Ground	*Acer negundo*	Boxelder
	Aralia nudicaulus	Wild Sarsaparilla
	Arisaema triphyllum	Jack-in-the-pulpit
	Athyrium felix-femina	Lady Fern
	Carex blanda	Charming Sedge
	Carex gracillima	Graceful Sedge
	Galium aparine	Cleavers
	Galium boreale	Northern bedstraw
	Geranium maculatum	Wild Geranium
	Maianthemum canadense	Canada May Flower
	Onoclea sensibiliss	Sensitive Fern
	Parthenocicus inserta	Woodbine
	Poa palustris	Kentucky Bluegrass
	Polyonatum biflorum	Giant Solomon's Seal
	Rhamnus cathartica	Common Buckthorn
	Ribes cynosbati	Prickley Gooseberry
	Smilacina racemosa	False Solomon's seal
	Streptopus roseus	riverbank Grape
	Thalictrum dioicum	Early Meadow-rue
	Trilium cernuum	Nodding Trillium

Natural Polygon ID	13G	MLCCS Code	32113
	Toxicodendron radicans	Common Poison Ivy	

Notes: Oak forest with open grown oaks dominating canopy. Formerly oak woodland, this is now forest with nearly continuous canopy closure. Understory a mix of quaking aspen and buckthorn.

Natural Polygon ID	13H	MLCCS Code	64111
Community Description	Water Lily Open Marsh	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Ground	*Nymphaea Odorata*	American White Water Lily
	Potamageton nodosus	American Pondweed
	Sagittaria rigida	Sessile-Fruited Arrowhead

Notes: Margins of Bush Lake with floating native vegetation.

Natural Polygon ID	13I	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	B
Field Check Level	3	Invasives	412-2
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Shrub	*Populus deltoides*	Cottonwood
	Salix exigua	Sandbar Willow
	Salix nigra	Black Willow
Ground	*Asclepias incarnata*	Marsh Milkweed
	Carex (Ovales type)	Ovales Sedge
	Carex comosa	Bottlebrush Sedge
	Carex languinosa	Wooly Sedge
	Carex ovales (type)	Ovales Sedge
	Carex vupinoidea	Fox Sedge
	Cyperus esculentus	Yellow Nut-sedge
	Eleocharis palustris	Red Stalked Spikerush
	Epilobium angustifolium	Fireweed

Natural Polygon ID	13I	MLCCS Code	61420

Erigeron philidelphicus	Philadelphia Fleabane
Eupatorium maculatum	Spotted Joe-pye-weed
Eupatorium perfoliatum	Boneset
Euthamia graminifolis	Grass leaved Goldenrod
Hordum jubatum	Foxtail Barley
Impatiens capensis	Spotted Touch-me-not
Iris versicolor	Blue Flag Iris
Juncus tenuis	Path Rush
Lycopus americanus	Cut-Leaved Bugleweed
Mimulus ringens	Monkey Flower
Panicum virgatum	Switchgrass
Phalaris arundinacea	Reed Canary Grass
Polygonum hydropiper	Marsh Waterpepper
Ranunculus acris	Tall Buttercup
Rhus glabra	Smooth Sumac
Rumex crispus	Curly Dock
Rumex crispus	Curly Dock
Rumex stenophyllus	Narrow Leaved Dock
Sagittaria latifolia	Broad Leaved Arrowhead
Scirpus cyperinus	Woolgrass
Scirpus validus	Soft Stem Bulrush
Scuttelaria galericulata	Marsh Skullcap
Stellaria aquatica	Giant Chickweed
Typha x glauca	Hybrid Cattail
Verbena hastata	Blue Vervain

Notes: Lakeshore edge maintained though herbicide and planting. Lakeshore edge of good quality. Some Hybrid Cattails and Reed Canary Grass present, but controlled. Reed Canary dieback due to herbicide appears successful/though ongoing. Plants are a mix of upland and wetland species, though mostly wetland species persist. Appears to be planted edge.

Natural Polygon ID	13J	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Red Oak
	Tilia americana	Basswood
	Quercus macrocarpa	Bur Oak

Notes: Fragmented Oak Forest in narrow strip. Heavy buckthorn throughout

Natural Polygon ID	13L	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-4
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Quercus rubra	Red Oak
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Tilia americana	Basswood
Subcanopy	*Prunus serotina*	Black Cherry
	Betula papyrifera	Paper Birch
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
	Ulmus americana	American Elm
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Prunus serotina	Black Cherry
	Prunus virginiana	Chokecherry
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Acer negundo*	Boxelder
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex blanda	Charming Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Circaea lutetiana	Common Enchanter's Nightshade
	Geranium maculatum	Wild Geranium
	Poa palustris	Fowl Bluegrass
	Rhamnus cathartica	Common Buckthorn
	Ribes cynosbati	Prickley Gooseberry
	Thalictrum dioicum	Early Meadow-rue
	Thalictrum thalictroides	Rue anemone
	Toxicodendron radicans	Common Poison Ivy
	Vitis riparia	Riverbank Grape

Notes: Fragmented Oak Forest with lots of buckthorn. Previously cut over with equal parts regeneration of Red Oak and Basswood.

Natural Polygon ID	13M	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-4
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Populus tremuloides	Quaking Aspen
	Quercus rubra	Red Oak
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Tilia americana	Basswood
Subcanopy	*Prunus serotina*	Black Cherry
	Betula papyrifera	Paper Birch
	Ostrya virginiana	Ironwood
	Populus tremuloides	Quaking Aspen
	Rhamnus cathartica	Common Buckthorn
	Tilia americana	Basswood
	Ulmus americana	American Elm
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Prunus serotina	Black Cherry
	Prunus virginiana	Chokecherry
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Acer negundo*	Boxelder
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex blanda	Charming Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Circaea lutetiana	Common Enchanter's Nightshade
	Galium aparine	Cleavers
	Geranium maculatum	Wild Geranium
	Parthenocissus inserta	Woodbine
	Poa palustris	Fowl Bluegrass
	Rhamnus cathartica	Common Buckthorn
	Ribes cynosbati	Prickley Gooseberry
	Thalictrum dioicum	Early Meadow-rue
	Thalictrum thalictroides	Rue anemone
	Toxicodendron radicans	Common Poison Ivy
	Vitis riparia	Riverbank Grape

Notes: Mesic oak forest with very heavy buckthorn infestation and soil disturbance. Mix of open grown and forest grown oaks, with basswood heavy in subcanopy.

Natural Polygon ID	13N	MLCCS Code	61620
Community Description	Mixed emergent marsh	Quality Ranking	C
Field Check Level	2	Invasives	412-3
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Lycopus americanus	Cut-leaved Bugleweed
	Carex vulpinoidea	Fox Sedge
	Carex (Ovales type)	Ovales Type Sedge
	Carex lasiocarpa (cf)	Wiregrass Sedge
	Polygonum hydropiper	Marsh Waterpepper
	Polygonum sagittatum	Arrow-leaved Tearthumb
	Polygonum amphibium	Water Smartweed
	Glyceria grandis	Tall Manna Grass
	Sagittaria rigida	Sessile Fruited Arrowhead
	Scirpus fluviatilis	River Bulrush
	Glyceria borealis	Northern Manna Grass
	Eleocharis palustris	Red Stalked Spikerush
	Iris versicolor	Blue Flag Iris
	Carex lacustris	Lake Sedge
	Carex utriculata	Beaked Sedge
	Phalaris arundinacea	Reed Canary Grass
	Sagittaria latifolia	Broad Leaved Arrowhead

Notes: Edge of shallow, open water body used as stormwater basin. Edge dominated by thriving native species mix with high diversity.

Natural Polygon ID	14A	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Populus deltoides	Cottonwood
Subcanopy	*Prunus serotina*	Black Cherry
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Prunus virginiana	Common Chokecherry
Ground	*Maianthemum canadense*	Canada May Flower
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Galium aparine	Cleavers

Notes: Mixed age oak forest heavily infested with buckthorn. Poor quality, though oaks present at all vertical strata.

Natural Polygon ID	14B	MLCCS Code	32113
Community Description	Oak Forest - Mesic subtype	Quality Ranking	B
Field Check Level	4	Invasives	408-5, 411-2
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus alba	White Oak
	Prunus serotina	Black Cherry
	Populus tremuloides	Quaking Aspen
Subcanopy	*Populus tremuloides*	Quaking Alpen
	Vitis riparia	Riverbank Grape
	Prunus serotina	Black Cherry
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Sambucus canadensis	Common Elder
	Prunus virginiana	Common Chokecherry
Ground	*Maianthemum canadense*	Canada May Flower
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Galium aparine	Cleavers
	Athyrium felix-femina	Lady Fern
	Osmunda claytoniana	Interrpted Fern
	Toxicodendron radicans	Common Poison Ivy
	Streptopus roseus	riverbank Grape
	Thalictrum dioicum	Early Meadow-rue
	Galium boreale	Northern bedstraw
	Geranium maculatum	Wild Geranium
	Polyonatum biflorum	Giant Solomon's Seal
	Smilacina racemosa	False Solomon's seal
	Aralia nudicaulus	Wild Sarsaparilla
	Ribes cynosbati	Prickley Gooseberry
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex gracillima	Graceful Sedge
	Acer negundo	Boxelder

Notes: Good quality mesic oak forest on north facing slope. Some invasion by buckthorn and garlic mustard. Forest edge is a dense mix of quaking aspen and young oaks. Garlic mustard dense in a couple of patches.

Natural Polygon ID	14C	**MLCCS Code**	61100
Community Description	Mesic Prairie	**Quality Ranking**	D
Field Check Level	3	**Invasives**	Kentucky Bluegrass
Surveyor	TR	**Date**	5/22/2007

Canopy	*Acer negundo*	Box Elder
Shrub	*Populus tremuloides*	Quaking Aspen
	Lonicera tatarica	Tartarian Honeysuckle
	Rhus glabbra	Smooth Sumac
Ground	*Amorpha canescens*	Leadplant
	Andropogon gerardii	Big Bluestem
	Achillea millefolium	Yarrow
	Aster laevis	Smooth Aster
	Aster cordifolius	Heart-leaved Aster
	Carex richardsonii	Richardson's Sedge
	Carex sp. (*ovales type)*	A type of Sedge
	Fragaria virginiana	Wild Strawberry
	Geranium maculatum	Wild geranium
	Geum triflorum	Prairie Smoke
	Lespedeza capitata	Round Headed Bushclover
	Lithospermum canescens	Hoary Puccoon
	Euphorbia esula	Leafy Spurge
	Lupinus perennis	Wild Lupine
	Melilotus sp.	Sweet Clover
	Modarda fistulosa	Wild Bergamot
	Parthenocissus inserta	Woodbine
	Poa pratensis	Kentucky bluegrass
	Schizachyrium scoparium	Little Bluestem
	Solidago canadensis	Canada Goldenrod
	Solidago rigida	Stiff Goldenrod
	Sorghastrum nutans	Indian Grass
	Toxicodendron radicans	Poison Ivy

Notes: Maintained prairie by burning, with natives prairie species dominant throughout. Kentucky Bluegrass a major component. Maintained by Bloomington parks.

Natural Polygon ID	14D	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 411-2
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Populus deltoides	Cottonwood
	Populus tremuloides	Quaking Alpen
	Quercus alba	White Oak
	Quercus rubra	Red Oak
Subcanopy	*Juniperus virginiana*	Eastern Red Cedar
	Prunus serotina	Black Cherry
	Acer ginnala	Amur Maple
	Picea glauca	White Spruce
	Rhamnus cathartica	Common Buckthorn
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Prunus virginiana	Common Chokecherry
	Rhus glabbra	Smooth Sumac
	Rubus allegheniensis	Allegheny Blackberry
	Sambucus canadensis	Common Elder
Ground	*Parthenocisus inserta*	Woodbine
	Geranium maculatum	Wild Geranium
	Hydrophyllum virginianum	Virginia waterleaf
	Vitis riparia	Riverbank Grape

Notes: Very narrow strip of Mesic Oak forest strips between backyards. Privately owned land is mostly very poor quality forest with existing remnant canopy and many planted tree and groundlayer species. Mapped as natural areas due to the presence and dominance of remnant oak forest canopy.

Natural Polygon ID	14E	MLCCS Code	61520
Community Description	Mixed emergent marsh - seasonally flooded	Quality Ranking	D
Field Check Level	2	Invasives	412-3
Surveyor	TR	Date	5/22/2007

Canopy	*Salix nigra*	Black Willow
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Carex lacustris	Lake Sedge
	Carex utriculata	Beaked Sedge
	Phalaris arundinacea	Reed Canary Grass
	Sagittaria latifolia	Broad Leaved Arrowhead

Notes: Small wetland basin located at the margins of remant oak forest strip and residential lots. Poor quality though native species still dominant with Reed canary common. New development on east side of basin may contribute sediment.

Natural Polygon ID	15A	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	C
Field Check Level	4	Invasives	402-3, 412-3, 406-3
Surveyor	TR	Date	5/22/2007

Shrub	*Cornus serecia*	Red Osier Dogwood
	Salix planifolia	Diamond Leaved Willow
Ground	*Calamagrostis canadensis*	Canada bluejoint
	Carex languinosa	Woolly Sedge
	Carex stricta	Tussock Sedge
	Impatiens capensis	Spotted Touch-me-not
	Lysimachia terrestris	Yellow Loosestrife
	Lythrum salicaria	Purple Loosestrife
	Phalaris arundinacea	Reed Canary Grass
	Polygonum amphibium	Water Smartweed
	Typha x glauca	Hybrid Cattail

Notes: Moderate quality sedge meadow with minimal invasion by Reed Canary Grass (at margins). Isolated and surrounded by shrub swamp disturbed forest and cattail marsh providing protection from Phalaris. Located within larger wetland complex along ditched Nine Mile Creek.

Natural Polygon ID	15B	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	C
Field Check Level	4	Invasives	412-3
Surveyor	TR	Date	5/22/2007

Shrub	*Betula pumila*	Bog Birch
	Cornus serecia	Red Osier Dogwood
	Salix exigua	Sandbar Willow
	Salix petiolaris	Slender Willow
	Salix planifolia	Diamond Leaved Willow
Ground	*Alysma subcordata*	Heart-leaved water plantain
	Calamagrostis canadensis	Canada bluejoint
	Carex lacustris	Lake Sedge
	Carex languinosa	Woolly Sedge
	Carex stricta	Tussock Sedge
	Carex stricta	Tussock Sedge
	Carex vulpinioidea	Fox Sedge
	Impatiens capensis	Spotted Touch-me-not
	Iris versicolor	Northern Blueflag Iris
	Juncus effusus	Soft Rush
	Lysimachia terrestris	Yellow Loosestrife
	Lythrum salicaria	Purple Loosestrife

Natural Polygon ID	15B	**MLCCS Code**	52430
	Onoclea sensibilis	Sensitive Fern	
	Phalaris arundinacea	Reed Canary Grass	
	Polygonum amphibium	Water Smartweed	
	Theliptis palustris	Marsh Fern	
	Typha x glauca	Hybrid Cattail	

Notes: Moderate Quality Willow Swamp heavily infested by Purple Loosestrife. Shade of Shrub component appears to be keeping invasive Reed Canary and Hybrid Cattails under control. High diversity of sedges present.

Natural Polygon ID	15C	**MLCCS Code**	61540
Community Description	Wet meadow - seasonally flooded	**Quality Ranking**	D
Field Check Level	4	**Invasives**	412-3
Surveyor	TR	**Date**	5/22/2007
Shrub	*Betula pumila*	Bog Birch	
	Cornus serecia	Red Osier Dogwood	
	Salix exigua	Sandbar Willow	
	Salix petiolaris	Slender Willow	
	Salix planifolia	Diamond Leaved Willow	
Ground	*Alysma subcordata*	Heart-leaved water plantain	
	Calamagrostis canadensis	Canada bluejoint	
	Carex lacustris	Lake Sedge	
	Carex languinosa	Woolly Sedge	
	Carex stricta	Tussock Sedge	
	Carex stricta	Tussock Sedge	
	Carex vulpinioidea	Fox Sedge	
	Impatiens capensis	Spotted Touch-me-not	
	Iris versicolor	Northern Blueflag Iris	
	Juncus effusus	Soft Rush	
	Lysimachia terrestris	Yellow Loosestrife	
	Lythrum salicaria	Purple Loosestrife	
	Onoclea sensibilis	Sensitive Fern	
	Phalaris arundinacea	Reed Canary Grass	
	Polygonum amphibium	Water Smartweed	
	Saggitaria graminea	Grass Leaved Arrowhead	
	Theliptis palustris	Marsh Fern	
	Typha x glauca	Hybrid Cattail	

Notes: Moderate Quality Emergent Wetland heavily infested by Purple Loosestrife. Shrub component present but not dominant. Located along drainage ditch.

Natural Polygon ID	15D	MLCCS Code	61540
Community Description	Wet Meadow - seasonally flooded	Quality Ranking	D
Field Check Level	3	Invasives	412-3
Surveyor	TR	Date	5/22/2007
Ground	*Typha x glauca*	Hybrid Cattail	
	Phalaris arundinacea	Reed Canary Grass	
	Calamagrostis canadensis	Canada bluejoint	
	Impatiens capensis	Spotted Touch-me-not	
	Carex stricta	Tussock Sedge	

Notes: Low quality, nearly pure stand of Canada Bluejoint and Tussock Sedge surrounded by Hybrid Cattail and Reed Canary Grass at the edge of a mixed emergent wetland complex

Natural Polygon ID	15E	MLCCS Code	61540
Community Description	Wet Meadow - seasonally flooded	Quality Ranking	D
Field Check Level	3	Invasives	406-3, 412-3
Surveyor	TR	Date	5/22/2007
Shrub	*Salix exigua*	Sandbar Willow	
	Cornus serecia	Red Osier Dogwood	
	Salix petiolaris	Slender Willow	
Ground	*Typha x glauca*	Hybrid Cattail	
	Phalaris arundinacea	Reed Canary Grass	
	Calamagrostis canadensis	Canada bluejoint	
	Impatiens capensis	Spotted Touch-me-not	
	Carex stricta	Tussock Sedge	
	Lysimachia terrestris	Yellow Loosestrife	
	Urtica dioica	Stinging Nettle	

Notes: Low quality, nearly pure stand of Canada Bluejoint and Tussock Sedge surrounded by Hybrid Cattail and Reed Canary Grass located between wooded neighborhood backyards and ditched Nine Mile Creek.

Natural Polygon ID	15F	MLCCS Code	32112
Community Description	Oak Forest mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 410-2
Surveyor	TR	Date	5/22/2007

Canopy	*Quercus alba*	White Oak
	Quercus rubra	Red Oak
	Prunus serotina	Black Cherry
	Acer negundo	Boxelder
	Quercus macrocarpa	Bur Oak
	Pinus resinosa	Red Pine (Planted)
	Salix nigra	Black Willow
	Populus deltoides	Cottonwood
	Quercus ellipsoidalis	Northern Pin Oak
Subcanopy	*Ostrya virginiana*	Ironwood
	Populus tremuloides	Quaking aspen
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Lonicera tatarica	Tartarian honeysuckle
	Vitis riparia	Riverbank Grape
	Ribes cynosbati	Prickly Gooseberry
	Xanthoxylum americanum	Prickly Ash
	Cornus racemosa	Gray Dogwood
Ground	*Impatiens capensis*	Spotted Touch-me-not
	Rhamnus cathartica	Common Buckthorn
	Maianthemum canadensis	Canada mayflower
	Thalicrum thalictroides	Rue anemone
	Parthenocissus inserta	Woodbine
	Acer negundo	Boxelder
	Carex pennsylvanica	Sun Loving Sedge
	Fragaria virginiana	Common Strawberry

Notes: Oak forest with mixed hardwood canopy dominated by oaks and shrub layer thickly dominated by Honeysuckle and Buckthorn. Mixed age and species trees throughout vertical strata. Forest slopes into back yards with mixed maintenance regimes and encroachment by residents into woods.

Natural Polygon ID	15G	MLCCS Code	32112
Community Description	Oak Forest - Mesic Subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-3, 410-3
Surveyor	TR	Date	6/14/2007

Canopy	*Populus deltoides*	Cottonwood
	Quercus alba	White Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
	Tilia americana	Basswood
	Acer negundo	Boxelder
	Fraxinus pennsylvanica	Green Ash
	Ulmus americana	American Elm
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Lonicera tatarica	Tartarian honeysuckle
	Cornus alternifolia	Pagoda Dogwood
	Ribes cynosbati	Prickly Gooseberry
	Sambucus canadensis	Common Elder
Ground	*Toxicodendron radicans*	Poison Ivy
	Thalictrum dioicum	Early Meadow Rue
	Solidago flexicaulis	Zigzag Goldenrod
	Geranium maculatum	Wild Geranium
	Viburnum rafinesquianum	Downy arrowwood
	Matteuccia struthiopteris	Ostrich Fern
	Osmunda claytoniana	Interrupted Fern
	Atherium felix-femina	Lady Fern
	Actea rubra	Red Baneberry
	Hydrophyllum virginianum	Virginia Waterleaf
	Aquilegia canadensis	Columbine
	Uvularia grandiflora	Large Flowered Bellwort
	Alliaria petiolaris	Garlic Mustard
	Viola sp.	Violet
	Rosa sp.	Rose
	Rhamnus cathartica	Common Buckthorn
	Maianthemum canadensis	Canada mayflower
	Thalicrum thalictroides	Rue anemone
	Parthenocissus inserta	Woodbine
	Acer negundo	Boxelder
	Carex pennsylvanica	Sun Loving Sedge
	Fragaria virginiana	Common Strawberry
	Corylus americana	American Hazel
	Acer negundo	Boxelder
	Carex roseus	Starry Sedge
	Apocynum androsaemifolium	Spreading Dogbane

Natural Polygon ID	15G	**MLCCS Code**	32112

Notes: Mesic Oak Forest on steep slopes between arterial road and back yards. Steep slopes have kept landowner encraochment to a minimum. Overstory dominated by forest grown oaks with Tilia component. Basswood and other species dominate understory. Buckthorn common, especially at road edge. Ground layer diversity if very high throughout with multiple micro habitats according to aspect and slope.

Natural Polygon ID	16A	**MLCCS Code**	32113
Community Description	Oak Forest Dry Subtype	**Quality Ranking**	D
Field Check Level	3	**Invasives**	408-2, 411-4
Surveyor	TR	**Date**	5/22/2007

Canopy	*Quercus macrocarpa*	Bur Oak
	Ulmus americana	American Elm
	Acer negundo	Boxelder
	Acer saccharinum	Silver Maple
	Fraxinus pennsylvanica	Green Ash
Subcanopy	*Acer negundo*	Boxelder
Shrub	*Rhamnus cathartica*	Common Buckthorn
Ground	*Alliaria petiolaria*	Garlic Mustard
	Amphicarpaea bracteata	Hog Peanut
	Parthenocissus inserta	Woodbine
	Fraxinus pennsylvanica	Green Ash
	Acer negundo	Boxelder
	Rhamnus cathartica	Common Buckthorn

Notes: Poor quality, small remnant hardwood forest with Buckthorn common thorughout. Isolated within back lots of residential community.

Natural Polygon ID	16B	**MLCCS Code**	61640
Community Description	Wet Meadow - Semipermanently Flooded	**Quality Ranking**	D
Field Check Level	4	**Invasives**	412-3
Surveyor	TR	**Date**	5/22/2007

Ground	*Scirpus fluviatalis*	River Bulrush
	Phalaris arundinacea	Reed Canary Grass

Notes: River Bulrush monotype located between monotype stands of Cattails, Reed Canary Grass and lowland hardwood forest.

Natural Polygon ID	16C	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	411-5
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Acer negundo	Boxelder
	Quercus macrocarpa	Bur Oak
Subcanopy	*Acer negundo*	Boxelder
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Viburnum trilobum	Highbush Cranberry
	Sorbaria sorbifolia	False spiraea
	Ribes americanum	Wild Black Currant
Ground	*Alliaria petiolata*	Garlic Mustard
	Fraxinus pennsylvanica	Green Ash
	Impatiens capensis	Spotted Touch-me-not
	Rhamnus cathartica	Common Buckthorn
	Gallium aparine	Cleavers
	Viola sp	Violet species
	Parthenocissus inserta	Woodbine
	Acer negundo	Boxelder
	Pilea pumila	Dwarf Clearweed
	Laportea canadensis	Wood Nettle

Notes: Very poor quality lowland hardwood forest with Oak Forest remnants on upper slopes. Multiple eroded ravines on slopes and large area of fill and dumping at upper slopes. Ground layer nearly 100% Garlic Mustard. Ravines filled with concrete rubble/blocks, but additional fill on slopes continues to erode into adjacent low basin beyond forest.

Natural Polygon ID	16D	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-4, HS-3, 411-2
Surveyor	TR	Date	5/22/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Populus tremuloides	Quaking Alpen
	Prunus serotina	Black Cherry
	Quercus alba	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak

Natural Polygon ID	16D	**MLCCS Code**	32113
Subcanopy	*Ostrya virginiana*	Ironwood	
	Populus deltoides	Cottonwood	
	Populus tremuloides	Quaking Alpen	
	Prunus serotina	Black Cherry	
	Quercus alba	White Oak	
	Quercus ellipsoidalis	Northern Pin Oak	
	Quercus macrocarpa	Bur Oak	
	Quercus rubra	Red Oak	
	Rhamnus cathartica	Common Buckthorn	
	Tilia americana	Basswood	
Shrub	*Rhamnus cathartica*	Common Buckthorn	
	Lonicera tatarica	Tartarian Honeysuckle	
	Ribes americana	Black Currant	
	Populus tremuloides	Quaking Alpen	
	Fraxinus pennsylvanica	Green Ash	
	Symphorocarpus alba	Snowberry	
Ground	*Alliaria petiolata*	Garlic Mustard	
	Arisaema triphyllum	Jack-in-the-pulpit	
	Aster novae-anliae	New England Aster	
	Athyrium felix-femina	Lady Fern	
	Carex - ovales type	An Ovales type sedge	
	Carex gracillima	Graceful Sedge	
	Carex pennsylvanica	Sun Loving Sedge	
	Fraxinus pennsylvanica	Green Ash	
	Galium aparine	Cleavers	
	Galium boreale	Northern bedstraw	
	Geranium maculatum	Wild Geranium	
	Laportea canadensis	Canadian Wood Nettle	
	Maianthemum canadense	Canada May Flower	
	Parthenocicus inserta	Woodbine	
	Poa pratensis	Kentucky Bluegrass	
	Ranunculus arbortivus	Small Flowered Buttercup	
	Rhamnus cathartica	Common Buckthorn	
	Smilacina racemosa	False Solomon's seal	
	Streptopus roseus	riverbank Grape	
	Thalictrum dioicum	Early Meadow-rue	
	Thalictrum thalictroides	Flase Meadow Rue	
	Toxicodendron radicans	Common Poison Ivy	
	Viola sororia	Hairy Wood Violet	

Notes: Large, and mixed quality Oak Forest with heavy buckthorn invasion throughout. Oaks dominant in closed canopy. Steep slopes provide microhabitats for moist species Interrupted Fern and Wet Sedges. Though upland, dry oak forest dominates.

Natural Polygon ID	20A	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-3, 411-4
Surveyor	FH	Date	8/1/2006

Location	Scientific Name	Common Name
Canopy	*Quercus alba*	White oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Celtis occidentalis*	Hackberry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Ribes cynosbati	Prickly gooseberry
	Sambucus racemosa	Red-berried elder
Ground	*Alliaria petiolata*	Garlic mustard
	Arisaema triphyllum	Jack-in-the-pulpit
	Athyrium filix-femina var. angustum	Lady fern
	Carex sprengelii	Sprengel's sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Parthenocissus vitacea	Virginia creeper
	Smilax ecirrata	Erect carrion flower

Notes: Dominated by Red oaks and Basswood, with dense subcanopy and shrub cover.

Natural Polygon ID	20B	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	CD
Field Check Level	3	Invasives	408-5, 411-4
Surveyor	FH	Date	8/1/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
Subcanopy	*Acer negundo*	Box elder
	Prunus virginiana	Chokecherry
	Tilia americana	Basswood
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Ribes missouriense	Missouri gooseberry
Ground	*Alliaria petiolata*	Garlic mustard
	Athyrium filix-femina var. angustum	Lady fern
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Geum canadense	White avens
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Parthenocissus vitacea	Virginia creeper
	Viola sororia	Common blue violet

Notes: Upper 2/3 of slope dominated by large, open-grown Bur oaks in matrix of young, small Box elders, Basswoods, and American elms. Extremely dense Common buckthorn throughout.

Natural Polygon ID	20C	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-5, 411-3
Surveyor	FH	Date	8/1/2006

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
	Ulmus americana	American elm
	Ulmus rubra	Red elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Sambucus racemosa	Red-berried elder
Ground	*Alliaria petiolata*	Garlic mustard
	Arisaema triphyllum	Jack-in-the-pulpit
	Boehmeria cylindrica	False nettle
	Campanula americana	Tall bellflower
	Carex blanda	Charming sedge
	Carex rosea	Starry sedge
	Galium triflorum	Sweet-scented bedstraw
	Geum canadense	White avens
	Hackelia virginiana	Virginia stickseed
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Quercus rubra	Northern red oak

Notes: Mesic oak forest dominated by Northern red oak and Basswood. High subcanopy dominated by Ironwood. Some young Northern red oak present and dense Common buckthorn throughout.

Natural Polygon ID	20E	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6, 411-5
Surveyor	FH	Date	8/1/2006

Location	Scientific Name	Common Name
Canopy	*Juglans nigra*	Black walnut
	Quercus alba	White oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Tilia americana	Basswood
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Ribes cynosbati	Prickly gooseberry
	Sambucus racemosa	Red-berried elder
Ground	*Alliaria petiolata*	Garlic mustard
	Arctium minus	Common burdock
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex blanda	Charming sedge
	Carex rosea	Starry sedge
	Carex sprengelii	Sprengel's sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Geum canadense	White avens
	Leonurus cardiaca	Common motherwort
	Oryzopsis racemosa	Black-fruited rice grass

Notes: Disturbed mesic oak forest dominated by widely spaced forest-grown Northern red oak and Basswood. Bur oak and White oak are rare. Subcanopy comprised of younger trees. Freuqent patches of young Hackberries, Box elders, Basswoods, and American elms within the mesic oak forest complex.

Natural Polygon ID	20F	MLCCS Code	32220
Community Description	Lowland hardwood forest	Quality Ranking	DC
Field Check Level	3	Invasives	408-6, 411-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black ash
	Tilia americana	Basswood
	Celtis occidentalis	Hackberry
	Quercus macrocarpa	Bur oak
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rhamnus frangula	Glossy buckthorn
	Viburnum trilobum	Highbush cranberry
Ground	*Impatiens capensis*	Spotted touch-me-not
	Boehmeria cylindrica	False nettle
	Carex lacustris	Lake sedge
	Smilacina stellata var. stellata	Starry false Solomon's seal
	Pilea fontana	Black-fruited clearweed
	Asarum canadense	Wild ginger
	Eupatorium rugosum	White snakeroot
	Amphicarpaea bracteata	Hog peanut
	Carex amphibola	Ambiguous sedge
	Menispermum canadense	Canada moonseed
	Vitis riparia	Wild grape
	Ratibida laciniata	Cut-leaved coneflower

Notes: Basswood and Hackberry dominated lowland hardwood with Black ash dominated seeps and dense buckthorn throughout.

Natural Polygon ID	20G	MLCCS Code	32311
Community Description	Blackash swamp seepage subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black ash
	Fraxinus pennsylvanica	Green ash
Shrubs	*Rhamnus cathartica*	Common buckthorn
Ground	*Pilea pumila*	Dwarf clearweed
	Impatiens capensis	Spotted touch-me-not

Notes: Low quality, low diversity Blackash seep, with dense understory of Common buckthorn.

Natural Polygon ID	21A	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-2, 412-4
Surveyor	TR	Date	10/8/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver Maple
	Fraxinus pennsylvanica	Green Ash
	Acer negundo	Boxelder
	Populus deltoides	Cottonwood
	Ulmus americana	American Elm
Subcanopy	*Ulmus americana*	American Elm
	Vitis riparia	Riverbank Grape
Ground	*Amphicarpa bracteata*	Hog Peanut
	Arcteum minus	Common Burdock
	Carex sp.	A Sedge species
	Echinocystis lobata	Wild Cucumber
	Elymus virginicus	Virginia Wild Rye
	Eupatorium rugosum	White Snakeroot
	Leersia virginiana	White Grass
	Phalaris arundinacea	Reed Canary Grass
	Pilea pumila	Dwarf Clearweed
	Rudbeckia laciniata	Tall Coneflower
	Setaria viridis	Green Foxtail
	Smilax tamnoides	Greenbriar
	Solidago canadensis	Canada Goldenrod
	Stachys palustris	Woundwort
	Ulmus americana	American Elm

Notes: Silver maple dominated floodplain forest located on sandy depositional bar on inside bank of Minnesota River. Overstory dominated by very large, mature silver maple with mature green ash and Cottonwood present. No shrub layer present. Ground layer is a mix of native species amidst dominant Reed Canary Grass.

Natural Polygon ID	21B	MLCCS Code	32211
Community Description	Willow Swamp	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	TR	Date	10/8/2006

Location	Scientific Name	Common Name
Canopy	*Salix nigra*	Black Willow
Shrubs	*Salix exigua*	Sandbar Willow
	Salix nigra	Black Willow
	Salix amygdaloides	Peach-leaved willow
	Salix discolor	Pussy Willow
Ground	*Carex sp.*	A species of sedge
	Carex languinosa	Woolly Sedge
	Pilea pumila	Dwarf Clearweed
	Acer rubra	Red Maple
	Leerzia oryzoides	Rice Cutgrass
	Vernonia fasciculata	Bunched Ironweed
	Echinocloa muricata	Rough Barnyard Grass
	Cyperus strigosus	Straw-colored Umbrella Sedge

Notes: Willow swamp located in low mineral soils between oxbow lake and main channel of Minnesota River.

Natural Polygon ID	21C	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	412-3
Surveyor	TR	Date	10/8/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver Maple
	Fraxinus pennsylvanica	Green Ash
	Acer negundo	Boxelder
	Populus deltoides	Cottonwood
	Ulmus americana	American Elm
Subcanopy	*Ulmus americana*	American Elm
	Vitis riparia	Riverbank Grape
Ground	*Amphicarpa bracteata*	Hog Peanut
	Arcteum minus	Common Burdock
	Carex sp.	A Sedge species
	Echinocystis lobata	Wild Cucumber
	Elymus virginicus	Virginia Wild Rye
	Eupatorium rugosum	White Snakeroot
	Leersia virginiana	White Grass
	Phalaris arundinacea	Reed Canary Grass
	Pilea pumila	Dwarf Clearweed
	Rudbeckia laciniata	Tall Coneflower
	Setaria viridis	Green Foxtail
	Smilax tamnoides	Greenbriar
	Solidago canadensis	Canada Goldenrod
	Stachys palustris	Woundwort
	Ulmus americana	American Elm

Notes: Silver maple dominated floodplain forest located along oxbow lake away from main channel of Minnesota River. Overstory dominated by very large, mature silver maple with mature green ash and Cottonwood present. No shrub layer present. Ground layer a mix of native and non-native species. Shaded and wet soils limit ground layer vegetation in some place where bare soil common.

Natural Polygon ID	21D	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	TR	Date	10/8/2006

Location	Scientific Name	Common Name
Canopy	*Acer sacharinum*	Silver Maple
	Fraxinus pennsylvanica	Green Ash
	Populus deltoides	Cottonwood
Subcanopy	*Vitis riparia*	Riverbank Grape
	Fraxinus pennsylvanica	Green Ash
Ground	*Laportea canadensis*	Wood Nettle
	Urtica dioica	Stinging Nettle

Notes: Floodplain forest dominated by cottonwoods. Bisected by two former railroad berms. Berms and forest edges dominated by Wood Nettle and Burdock. Ground layer nearly continuous Wood nettle during August field survey.

Natural Polygon ID	22A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 410-3
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Prunus serotina*	Black Oak
	Quercus alba	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Ulmus americana*	American Elm
	Juniperus virginiana	Eastern Red Cedar
	Quercus alba	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Prunus serotina	Black Cherry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
Shrubs	*Lonicera tatarica*	Tartarian Honeysuckle
	Rhamnus cathartica	Common buckthorn
Ground	*Parthenocissus inserta*	Woodbine
	Quercus macrocarpa	Bur oak
	Circaea lutetiana	Common Enchanter's Nightshade
	Vitis riparia	Riverbank Grape
	Carex pensylvanica	Pennsylvania sedge
	Prunella vulgaris	Heal-all

Natural Polygon ID	22A	**MLCCS Code**	32112

Notes: Poor quality open grown oak canopy with heavy Ironwood in understory. Canopy closed in by Ostrya, Basswood, younger oaks, buckthorn and black cherry. Honeysuckle very heavy, especially at edges.

Natural Polygon ID	22B	**MLCCS Code**	32112
Community Description	Oak Forest, Mesic Subtype	**Quality Ranking**	D
Field Check Level	3	**Invasives**	408-5, 410-3
Surveyor	TR	**Date**	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Prunus serotina*	Black Oak
	Quercus alba	White Oak
	Quercus macrocarpa	Bur oak
	Populus tremuloides	Quaking Aspen
	Quercus rubra	Northern red oak
Subcanopy	*Ulmus americana*	American Elm
	Juniperus virginiana	Eastern Red Cedar
	Populus tremuloides	Quaking Aspen
	Quercus alba	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Prunus serotina	Black Cherry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
		Tartarian
Shrubs	*Lonicera tatarica*	Honeysuckle
	Rhamnus cathartica	Common buckthorn
Ground	*Parthenocissus inserta*	Woodbine
	Actea rubra	Red Baneberry
	Quercus macrocarpa	Bur oak
	Circaea lutetiana	Common Enchanter's Nightshade
	Vitis riparia	Riverbank Grape
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Prunella vulgaris	Heal-all

Notes: Poor quality open grown oak canopy with heavy Ironwood in understory. Canopy closed in by Ostrya, Basswood, younger oaks, buckthorn and black cherry. Honeysuckle very heavy, especially at edges.

Natural Polygon ID	22C	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-3, 410-3, 411-3
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Sugar Maple
	Populus tremuloides	Quaking Aspen
	Prunus serotina	Black Oak
	Quercus alba	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Ulmus americana*	American Elm
	Juniperus virginiana	Eastern Red Cedar
	Ulmus rubra	Red Elm
	Celtis occidentalis	Hackberry
	Populus tremuloides	Quaking Aspen
	Quercus alba	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Prunus serotina	Black Cherry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
Shrubs	*Lonicera tatarica*	Tartarian Honeysuckle
	Rhamnus cathartica	Common buckthorn
Ground	*Parthenocissus inserta*	Woodbine
	Actea rubra	Red Baneberry
	Quercus macrocarpa	Bur oak
	Circaea lutetiana	Common Enchanter's Nightshade
	Vitis riparia	Riverbank Grape
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Arisaema triphyllum	Jack-in-the-Pulpet
	Ribes cynosbati	Prickly Gooseberry
	Sicyos angulatus	Bur cucumber
	Alliaria petiolata	Garlic Mustard
	Blephillia hirsuta	Woodmint
	Leonurus cardiaca	Motherwort
	Prunella vulgaris	Heal-all

Notes: Poor quality open grown oak canopy with heavy Ironwood in understory. Canopy closed in by Ostrya, Basswood, younger oaks, buckthorn and black cherry. Honeysuckle very heavy, especially at edges. Oak wilt present and being controlled (through cutting and removal) by the City of Bloomington.

Natural Polygon ID	22D	MLCCS Code	93220
Community Description	Water Lily Open Marsh	Quality Ranking	C
Field Check Level	2	Invasives	
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Ground	*Nymphaea odorata*	American White Water Lily

Notes: Floating White Water lily edge of open water. Monotype.

Natural Polygon ID	22E	MLCCS Code	61100
Community Description	Mesic Tallgrass Prairie	Quality Ranking	C
Field Check Level	3	Invasives	409-2, 413-3
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Juniperus virginiana*	Eastern Red Cedar
Shrub	*Lonicera tatarica*	Tartarian Honeysuckle
	Juniperus virginiana	Eastern Red Cedar
Ground	*Euphorbia esula*	Leafy Spurge
	Andropogon gerardii	Big Bluestem
	Carex richardsonii	Richardson's Sedge
	Lespedeza capitata	Round Headed Bush Clover
	Lithospermum canescens	Hoary Puccoon
	Monarda fistulosa	Wild Bergamot
	Poa pratensis	Kentucky Bluegrass
	Rhus radicans	Poison Ivy
	Schizachyrium scoparium	Little Bluestem
	Solidago canadensis	Canada Goldenrod
	Solidago rigida	Stiff Goldenrod
	Solidago speciosa	Showy Goldenrod
	Sorghastrum nutans	Indian Grass
	Parthenocisus inserta	Woodbine
	Achellia millefolium	Yarrow
	Rucbeckia hirta	Black-eyed-Susan
	Potentilla argentea	Silvery cinquefoil
	Sporobolus heterolepis	Northern Dropseed
	Phleum pratense	Timothy
	Lotus corniculata	Bird's Foot Trefoil

Notes: Restored/maintained prairie. Roughly half of entire area dominated by native species community. Other half planted prairie still dominated by non-natives Smooth Brome and Kentucky Bluegrass (mapped as 23212). Heavily dominated by grasses with a few forbs scattered throughout.

Natural Polygon ID	22F	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	B
Field Check Level	3	Invasives	412-3
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Shrub	*Salix exigua*	Sandbar Willow
	Salix pedicularis	Meadow willow
	Salix discolor	Pussy Willow
Ground	*Alisma triviale*	Common Water Plantian
	Asclepias incarnata	Marsh Milkweed
	Carex (Ovales type)	Ovales Sedge
	Carex lacustris	Lake Sedge
	Cicuta bulbifera	Bulb-bearing Water Hemlock
	Glyceria grandis	Tall Manna Grass
	Glyceria striata	Fowl Manna Grass
	Impatiens capensis	Spotted Touch-me-not
	Lemna minor	Lesser Duckweed
	Lycopus virginicus	Virginia bugleweed
	Phalaris arundinacea	Reed Canary Grass
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus cyperinus	Woolgrass
	Scirpus validus	Soft Stem Bulrush
	Typha x glauca	Hybrid Cattail

Notes: Wet meadow on floating mat located within open space forest. Floating mat is made up of emergent vegetation, not dominated by sphagnum.

Natural Polygon ID	22G	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	C
Field Check Level	3	Invasives	406-3
Surveyor	TR	Date	7/11/2007

Location	Scientific Name	Common Name
Shrub	*Cornus serecia*	Red Osier Dogwood
	Ulmus rubra	Red Elm
Ground	*Apocynum androsaemifolium*	Spreading Dogbane
	Asclepias incarnata	Marsh Milkweed
	Asclepias syriaca	Common Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Carex (Ovales type)	Ovales Sedge
	Carex lacustris	Lake Sedge
	Carex languinosa	Wooly Sedge
	Juncus tenuis	Path Rush
	Lycopus americanus	Cut-Leaved Bugleweed
	Melilotus alba	White Sweet Clover
	Phalaris arundinacea	Reed Canary Grass
	Rhus glabra	Smooth Sumac
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad Leaved Arrowhead
	Salix exigua	Sandbar Willow
	Scirpus cyperinus	Woolgrass
	Scirpus validus	Soft Stem Bulrush
	Solidago canadensis	Canada Goldenrod
	Typha x glauca	Hybrid Cattail
	Verbena stricta	Blue Vervain
		Bird's Foot Trefoil

Notes: Lakeshore edge maintained though herbicide and planting. Lakeshore edge of good quality. Some Hybrid Cattails and Reed Canary Grass present, but controlled.

Natural Polygon ID	22H	MLCCS Code	61100
Community Description	Mesic Tallgrass Prairie	Quality Ranking	B
Field Check Level	3	Invasives	
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvancia*	Green Ash
	Tilia americana	Basswood
Shrub	*Cornus racemosa*	Gray Dogwood
	Juniperus virginiana	Eastern Red Cedar
Ground	*Euphorbia esula*	Leafy Spurge
	Achellia millefolium	Yarrow
	Andropogon gerardii	Big Bluestem
	Bouteloua curtipendula	Side-oats Grama
	Bromus ciliatus	Prairie Brome
	Bromus kalmii	Kalm's Brome
	Carex richardsonii	Richardson's Sedge
	Dalea candida	White Prairie Clover
	Dalea purpurea	Purple Prairie Clover
	Echinacea purpurea	Purple Coneflower
	Elymus virginicus	Virginia Wild Rye
	Heliopsis helianthoides	Ox-eye
	Lespedeza capitata	Round Headed Bush Clover
	Lithospermum canescens	Hoary Puccoon
	Lotus corniculata	Bird's Foot Trefoil
	Melilotus alba	White Sweet Clover
	Monarda fistulosa	Wild Bergamot
	Parthenocisus inserta	Woodbine
	Phleum pratense	Timothy
	Poa pratensis	Kentucky Bluegrass
	Potentilla argentea	Silvery cinquefoil
	Ratibida pinnata	Gray-headed Coneflower
	Rhus radicans	Poison Ivy
	Rucbeckia hirta	Black-eyed-Susan
	Rumex crispus	Curly Dock
	Schizachyrium scoparium	Little Bluestem
	Silene latifolia	White Campion
	Solidago canadensis	Canada Goldenrod
	Solidago rigida	Stiff Goldenrod
	Solidago speciosa	Showy Goldenrod
	Sorghastrum nutans	Indian Grass
	Sporobolus heterolepis	Northern Dropseed

Verbascum thapsus	Common Mullein

Notes: Restored/maintained prairie. Roughly half of entire area dominated by native species community. Other half planted prairie still dominated by non-natives Smooth Brome and Kentucky Bluegrass (mapped as 23212). Heavily dominated by grasses.

Natural Polygon ID	23A	**MLCCS Code**	42120
Community Description	Oak woodland-brushland	**Quality Ranking**	D
Field Check Level	3	**Invasives**	408-4
Surveyor	TR	**Date**	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus alba*	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Celtis occidentalis*	Hackberry
	Fraxinus pennsylvanica	Green Ash
	Prunus serotina	Black Cherry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
	Rhamnus cathartica	Common buckthorn
Shrubs	*Fraxinus pennsylvanica*	Green Ash
	Rhamnus cathartica	Common buckthorn
Ground	*Arisaema triphyllum*	Jack-in-the-pulpit
	Alliaria petiolata	Garlic mustard
	Aster cordifolius	Heart-leaved aster
	Campanula americana	Tall bellflower
	Carex pennsylvanica	Sun Loving Sedge
	Eupatorium rugosum	White snakeroot
	Galium apraine	Cleavers
	Osmorhiza claytonii	Clayton's sweet cicely
	Geranium maculatum	Wild Geranium
	Tilia americana	Basswood
	Toxicodendron radicans	Poison Ivy
	Smilacina racemosa	False Solomon's Seal

Notes: Highly disturbed oak woodland with open grown Bur oaks and dense, small American elms and Common Buckthorns throughout.

Natural Polygon ID	23B	MLCCS Code	32220
Community Description	Lowland Hardwood	Quality Ranking	D
Field Check Level	4	Invasives	408-4, 412-2
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Populus tremuloides*	Quaking Aspen
	Tilia americana	Basswood
	Ulmus rubra	Red Elm
	Fraxinus pennsylvanica	Green ash
	Populus deltoides	Cottonwood
Subcanopy	*Populus tremuloides*	Quaking Aspen
	Ostrya virginiana	Ironwood
	Rhamnus cathartica	Common Buckthorn
	Tilia americana	Basswood
	Ulmus rubra	Red Elm
	Fraxinus pennsylvanica	Green ash
	Populus deltoides	Cottonwood
	Acer negundo	Box elder
Shrub	*Rhamnus cathartica*	Common Buckthorn
Ground	*Carex retrorsa*	Retrorse Sedge
	Carex deweyana	Dewey's Sedge
	Amphicarpa bracteata	Hog Peanut
	Carex tribuloides	Blunt Broom Sedge
	Erigeron philidelphicus	Philidelphia Fleabane
	Vitis riparia	Riverbank Grape
	Phalaris arundinacea	Reed Canary Grass
	Eupatorium rugosum	White Snakeroot
	Leersia virginica	White Grass
	Poa pratensis	Kentucky Bluegrass
	Carex disperma	Soft-leaved Sedge
	Carex vulpinoidea	Fox Sedge
	Arisaema triphyllum	Jack-in-the-Pulpet
	Pilea pumila	Dwarf Clearweed
	Urtica diocica	Stinging Nettle
	Carex blanda	Charming Sedge
	Laportea canadensis	Wood Nettle
	Carex (Ovales type)	Ovales Sedge

Notes: Lowland hardwood forest heavily invaded by buckthorn. Deeply incised channels typical throughout. Despite dense buckthorn, diverse ground layer is thriving mostly near lowest areas/ravines. Some areas heavily logged in past.

Natural Polygon ID	23C	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-4
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Populus tremuloides*	Quaking Aspen
	Quercus alba	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
Subcanopy	*Quercus alba*	White Oak
	Quercus ellipsoidalis	Northern Pin Oak
	Quercus macrocarpa	Bur Oak
	Quercus rubra	Red Oak
	Populus tremuloides	Quaking Alpen
	Juniperus virginiana	Eastern Red Cedar
	Prunus serotina	Black Cherry
	Tilia americana	Basswood
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Zanthoxylum americana	Prickly Ash
Ground	*Anemone cylindrica*	Long Headed Thimbleweed
	Carex blanda	Charming Sedge
	Carex Ovales type	Ovales Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex roseus	Starry Sedge
	Galium aparine	Cleavers
	Juncus tenuis	Path Rush
	Rhamnus cathartica	Common Buckthorn
	Ribes cynosbati	Prickley Gooseberry
	Toxicodendron radicans	Common Poison Ivy

Notes: Closed canopy Oak Forest with open grown oaks dominating canopy. Mapped as forest due to understory oaks and especially Basswood forming nearly continuous cover. Site is reverting to Basswood dominance in absence of fire. Buckthorn common throughout.

Natural Polygon ID	23D	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-3, 411-3
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Acer sacharinum*	Silver Maple
	Tilia americana	Basswood
	Fraxinus pennsylvanica	Green Ash
	Ulmus americana	American Elm
Subcanopy	*Acer sacharinum*	Silver Maple
	Tilia americana	Basswood
	Fraxinus pennsylvanica	Green Ash
	Ulmus americana	American Elm
	Vitis riparia	Riverbank Grape
Shrub	*Rhamnus cathartica*	Common Buckthorn
Ground	*Leersia oryzoides*	Rice Cut Grass
	Pilea pumila	Dwarf Clearweed
	Leonurus cardiaca	Motherwort
	Alliaria petiolata	Garlic Mustard
	Laportea canadensis	Wood Nettle
	Phalaris arundinacea	Reed Canary Grass
	Galium aparine	Cleavers
	Rhamnus cathartica	Common Buckthorn

Notes: Lowland Hardwood Forest with some floodplain species present. Shrub and gournd layer vegetation dominated by Rhamnus and Garlic Mustard except in lowest.

Natural Polygon ID	23E	MLCCS Code	61620
Community Description	Emergent Marsh	Quality Ranking	B
Field Check Level	4	Invasives	412-3
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake Sedge
	Carex (Ovales type)	Ovales Sedge
	Potentilla palustris	Marsh Cinquefoil
	Carex retrorsa	Retrorse Sedge
	Convovulus arvensis	Field Bindweed
	Glyceria grandis	Tall Manna Grass
	Impatiens capensis	Spotted Touch-me-not
	Lycopus americana	American Water Horehound
	Phalaris arundinacea	Reed Canary Grass
	Polygonum hydropiper	Marsh Waterpepper
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush
	Scirpus validus	Soft Stem Bulrush
	Sparganium eurycarpum	Giant Bur Reed
	Typha x glauca	Hybrid Cattail
	Verbena hastata	Blue Vervain
	Eleocharis ovata	Ovoid Spikerush
	Alisma triviale	Common Water Plantian
	Polygonum amphibium	Water Smartweed
	Ranunculus septentrionalis	Swamp Buttercup
	Stellaria sp.	Chickweed sp.
	Mentha arvensis	Common Mint
	Urtica dioica	Stinging Nettle
	Scirpus cyperinus	Woolgrass

Notes: Shallow basin within Three Rivers Park District Park. Wetland dominated by River Bulrush with mixed emergent community between water and Bulrush. Upper areas dominated by Reed Canary Grass monotype.

Natural Polygon ID	23F	MLCCS Code	32112
Community Description	Oak Forest - Mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-4
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Red Oak
	Tilia americana	Basswood
Subcanopy	*Prunus serotina*	Black Cherry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
	Ulmus americana	American Elm
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Prunus serotina	Black Cherry
	Prunus virginiana	Chokecherry
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Acer negundo*	Boxelder
	Arisaema triphyllum	Jack-in-the-pulpit
	Carex blanda	Charming Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Circaea lutetiana	Common Enchanter's Nightshade
	Geranium maculatum	Wild Geranium
	Poa palustris	Fowl Bluegrass
	Rhamnus cathartica	Common Buckthorn
	Ribes cynosbati	Prickley Gooseberry
	Thalictrum dioicum	Early Meadow-rue
	Thalictrum thalictroides	Rue anemone
	Toxicodendron radicans	Common Poison Ivy
	Vitis riparia	Riverbank Grape

Notes: Fragmented Oak Forest with lots of buckthorn. Previously cut over with equal parts regeneration of Red Oak and Basswood.

Natural Polygon ID	25A	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	TR	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus alba*	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Tilia americana*	Basswood
	Rhamnus cathartica	Common buckthorn
	Ulmus americana	American Elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Zanthoxylum americana	Prickley Ash
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Rhamnus cathartica*	Common buckthorn
	Erigeron philadelphicus	Philadelphia Daisy Fleabane
	Poa pratensis	Kentucky Bluegrass
	Fragaria sp.	Strawberry
	Solidago canadensis	Canada Goldenrod
	Parthenocissus inserta	Woodbine
	Carex pennsylvanica	Sun Loving Sedge

Notes: Open grown oak woodland brushlend with continuous understory of buckthorn. Canopy only open grown oaks. Very poor quality.

Natural Polygon ID	25B	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	TR	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus alba*	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Rhamnus cathartica*	Common buckthorn
	Tilia americana	Basswood
	Ulmus americana	American Elm
Shrubs	*Lonicera tatarica*	Tartarian Honeysuckle
	Rhamnus cathartica	Common buckthorn
	Rubus idaeus	Red Raspberry
	Zanthoxylum americana	Prickley Ash
Ground	*Carex pennsylvanica*	Sun Loving Sedge
	Actea rubra	Red Baneberry
	Alliaria petiolaris	Garlic Mustard
	Leonurus cardiaca	Motherwort
	Solidago flexicaulis	Zigzag Goldenrod
	Atherium felix-femina	Lady Fern
	Erigeron philadelphicus	Philadelphia Daisy Fleabane
	Fragaria sp.	Strawberry
	Parthenocissus inserta	Woodbine
	Poa pratensis	Kentucky Bluegrass
	Rhamnus cathartica	Common buckthorn
	Solidago canadensis	Canada Goldenrod

Notes: Open grown oak woodland brushland with continuous understory of buckthorn. Steep slopes. Mix of open grown and forest grown oaks present. Buckthorn dominant in all layers except canopy. Very poor quality.

Natural Polygon ID	25C	MLCCS Code	61110
Community Description	Mesic Prairie	Quality Ranking	D
Field Check Level	3	Invasives	413-2, 415-2
Surveyor	TR	Date	7/1/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green Ash
Ground	*Andropogon gerardii*	Big Bluestem
	Sorghastrum nutans	Indian Grass
	Sporobolis heterolepis	Northern Dropseed
	Panicum virgatum	Switchgrass
	Poa pratensis	Kentucky Bluegrass
	Hypericum perforatum	Common St. John's wort
	Fraxinus pennsylvanica	Green Ash
	Ratibida pinnata	Gray Headed Coneflower

Notes: Planted prairie entirely dominated by tall grasses. Few invasives present, and solid ground cover throughout. Low diversity.

Natural Polygon ID	25D	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	TR	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus alba*	White Oak
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Tilia americana*	Basswood
	Rhamnus cathartica	Common buckthorn
	Ulmus americana	American Elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Zanthoxylum americana	Prickley Ash
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Rhamnus cathartica*	Common buckthorn
	Erigeron philadelphicus	Philadelphia Daisy Fleabane
	Poa pratensis	Kentucky Bluegrass
	Fragaria sp.	Strawberry
	Solidago canadensis	Canada Goldenrod
	Parthenocissus inserta	Woodbine
	Carex pennsylvanica	Sun Loving Sedge

Notes: Open grown oak woodland brushlend with continuous understory of buckthorn. Canopy only open grown oaks. Very poor quality.

Natural Polygon ID	26A	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 411-3
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Populus tremuloides	Quaking Aspen
	Quercus ellipsoidalis	White Oak
	Quercus rubra	Red Oak
Subcanopy	*Tilia americana*	Basswood
	Prunus serotina	Black Cherry
	Ulmus americana	American Elm
	Vitis riparia	riverbank Grape
	Ostrya virginiana	Ironwood
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Lonicera tatarica	Tartarian Honeysuckle
	Parthenocissus quiquefolia	Woodbine
	Rubus ideaus	Red Raspberry
Ground	*Alliaria petiolaris*	Garlic Mustard
	Athyrium felix-femina	Lady Fern
	Carex cephalophora	Oval-headed Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex rosea	Starry Sedge
	Fraxinus pennsylvanica	Green Ash
	Galium aparine	Cleavers
	Parthenocicus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Vitis riparia	riverbank Grape

Notes: Oak forest with mix of open grown and forest grown oaks in canopy on steep slopes. Subcanopy nearly completely dominated by Ironwood. Ground and Shrub layer dominated by Buckthorn and Sun Loving Sedge. Bike jumps and paths created throughout woods, leaving exposed/erodible slopes.

Natural Polygon ID	26B	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	C
Field Check Level	3	Invasives	408-3,Glossy Buckthorn-2, 412-2, 406-2
Surveyor	TR	Date	6/14/2007

Shrubs	*Cornus serecia*	Red Osier Dogwood
	Spiraea alba	Meadowsweet
	Salix eriocephala	Heart-leaved Willow
	Salix exigua	Sandbar Willow
	Salix petiolaris	Slender Willow
Ground	*Asclepias incarnata*	Marsh Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh Bellflower
	Carex lacustris	Lake Sedge
	Carex stricta	Tussock Sedge
	Carex utriculata	Common Yellow Lake Sedge
	Carex vulpinoidea	Fox Sedge
	Lythrum salicaria	Purple Loosestrife
	Onoclea sensibilis	Sensitive Fern
	Phalaris arundinacea	Reed Canary Grass
	Polygonum amphibium	Water Smartweed
	Theliptis palustris	Marsh Fern
	Typha x glauca	Hybrid Cattail
	Lycopus americana	Water Horehound
	Polygonum hydropiper	Marsh Waterpepper
	Asclepias syriaca	Common Milkweed
	Glyceria grandis	Tall Manna Grass
	Carex normalis	Right-angle Sedge
	Anemone canadensis	Canada Anemone
	Lathyrus sp.	Twining Pea
	Equisetum fluviatale	Water Horsetail
	Urtica dioica	Stinging Nettle

Notes: Moderate Quality Willow swamp with diverse ground layer and limited invasive species. Diverse willow community maintains diversity of understory in wet, and partially shaded conditions. Located between forest heavily overgrown with buckthorn and

Natural Polygon ID	26C	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	B
Field Check Level	3	Invasives	408-3,Glossy Buckthorn-2, 412-2, 406-2
Surveyor	TR	Date	6/14/2007

Shrubs	*Acer ginnela*	Amur Maple
	Cornus serecia	Red Osier Dogwood
	Fraxinus pennsylvanica	Green Ash
	Rhamnus frangula	Glossy Buckthorn
	Spiraea alba	Meadowsweet
	Salix eriocephala	Heart-leaved Willow
	Salix exigua	Sandbar Willow
	Salix nigra	Black Willow
	Salix petiolaris	Slender Willow
Ground	*Anemone canadensis*	Canada Anemone
	Asclepias incarnata	Marsh Milkweed
	Asclepias syriaca	Common Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh Bellflower
	Carex bebbii	Bebb's Sedge
	Carex emoryi	Emory's Sedge
	Leersia oryzoides	Rice Cut Grass
	Impatiens capensis	Spotted Touch-me-not
	Carex lupuliformis	Hop Sedge
	Carex lacustris	Lake Sedge
	Carex normalis	Right-angle Sedge
	Carex pellita	Woolly Sedge
	Carex (Ovales type)	Ovales Sedge
	Carex stricta	Tussock Sedge
	Carex utriculata	Common Yellow Lake Sedge
	Carex vulpinoidea	Fox Sedge
	Equisetum fluviatale	Water Horsetail
	Glyceria grandis	Tall Manna Grass
	Lathyrus sp.	Twining Pea
	Lycopus americana	Water Horehound
	Lythrum salicaria	Purple Loosestrife
	Onoclea sensibilis	Sensitive Fern
	Phalaris arundinacea	Reed Canary Grass
	Polygonum amphibium	Water Smartweed
	Polygonum hydropiper	Marsh Waterpepper
	Sagittaria latifolia	Broad Leaved Arrowhead
	Theliptis palustris	Marsh Fern
	Typha x glauca	Hybrid Cattail
	Urtica dioica	Stinging Nettle

Natural Polygon ID	26C	MLCCS Code	52430

Notes: Good Quality Willow swamp with very diverse ground layer but abundant invasive species. Diverse willow community maintains diversity of understory in wet, and partially shaded conditions. Sedge diversity very high throughout. Located between forest heavily overgrown with buckthorn and Reed Canary Grass/Hybrid Cattail wetlands associated with Nine Mile Creek.

Natural Polygon ID	26D	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 411-2
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus ellipsoidalis	White Oak
Subcanopy	*Tilia americana*	Basswood
	Quercus ellipsoidalis	Northern Pin Oak
	Juniperus virginiana	Eastern Red Cedar
	Prunus serotina	Black Cherry
	Ulmus americana	American Elm
	Vitis riparia	riverbank Grape
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Fraxinus pennsylvanica	Green Ash
	Ribes cynosbati	Prickly Gooseberry
	Prunus virginiana	Common Chokecherry
	Rubus ideaus	Red Raspberry
Ground	*Alliaria petiolaris*	Garlic Mustard
	Athyrium felix-femina	Lady Fern
	Carex blanda	Charming Sedge
	Carex pennsylvanica	Sun Loving Sedge
	Carex rosea	Starry Sedge
	Circaea lutetiana	Enchanter's Nightshade
	Fraxinus pennsylvanica	Green Ash
	Galium aparine	Cleavers
	Hedera helix	English Ivy
	Hydrophyllum virginiana	Virginia Waterleaf
	Juncus tenuis	Path Rush
	Leucanthemum vulgare	Common Daisy
	Parthenocicus inserta	Woodbine
	Poa pratensis	Kentucky Bluegrass
	Ranunculus recurvatus	Hooked Crowfoot
	Smilacina racemosa	False Solomon's Seal
	Verbascum thapsus	Mullien
	Vitis riparia	riverbank Grape

Notes: Highly disturbed oak forest with wide mowed paths and mowed edge will into tree canopy. Open grown oaks dominate canopy, though combination of canopy and undestory has created closed canopy (forest) condition. Shrub and ground layers very poor with multiple garden/weed species. English Ivy present.

Natural Polygon ID	26F	MLCCS Code	32113
Community Description	Oak Forest - Dry subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5
Surveyor	TR	Date	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur Oak
	Quercus alba	White Oak
	Quercus rubra	Red Oak
	Quercus ellipsoidalis	Northern Pin Oak
Subcanopy	*Tilia americana*	Basswood
	Quercus ellipsoidalis	Northern Pin Oak
	Rhamnus cathartica	Common Buckthorn
	Juglans nigra	Black Walnut
	Prunus serotina	Black Cherry
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Ribes americanum	Wild Black Currant
	Symphorocarpus alba	Snowberry
	Lonicera tatarica	Tartarian Honeysuckle
	Fraxinus pennsylvanica	Green Ash
	Ribes cynosbati	Prickly Gooseberry
	Prunus virginiana	Common Chokecherry
	Rubus ideaus	Red Raspberry
Ground	*Carex pennsylvanica*	Sun Loving Sedge
	Circaea lutetiana	Enchanter's Nightshade
	Galium aparine	Cleavers
	Hydrophyllum virginiana	Virginia Waterleaf
	Parthenocicus inserta	Woodbine
	Smilacina racemosa	False Solomon's Seal
	Vitis riparia	riverbank Grape
	Rhamnus cathartica	Common Buckthorn
	Ulmus americana	American Elm
	Carex blanda	Charming Sedge

Notes: Highly disturbed oak forest with many areas of past excavation. Open grown oaks exist within closed canopy condition. Canopy closing with Basswood, Rhamnus and young oaks. Rhamnus near 100% coverage at low margins near open wetlands. Unmaintained trials and bare soils common throughout.

Natural Polygon ID	27A	MLCCS Code	32220
Community Description	Lowland Hardwood	Quality Ranking	D
Field Check Level	3	Invasives	408-4, 411-3, 410-3
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Tilia americana*	Basswood
	Juglans nigra	Black Walnut
	Quercus macrocarpa	Bur Oak
	Fraxinus nigra	Black Ash
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Populus deltoides	Cottonwood
Subcanopy	*Tilia americana*	Basswood
	Ulmus americana	American Elm
	Fraxinus nigra	Black Ash
Shrub	*Lonicera tatarica*	Tartarian honeysuckle
	Ribes cynosbati	Prickley Gooseberry
	Rhamnus cathartica	Common Buckthorn
Ground	*Smilacina racemosa*	False Solomon's Seal
	Parthenocissus inserta	Woodbine
	Amphicarpa bracteata	Hog Peanut
	Leersia virginica	White Grass
	Alliaria petiolaris	Garlic Mustard
	Vitis riparia	Riverbank Grape
	Phalaris arundinacea	Reed Canary Grass
	Uvularia grandiflora	Large Flowered Bellwort
	Arcteum minus	Common Burdock
	Nepeta cataria	Catnip
	Acer negundo	Boxelder
	Leonurus cardiaca	Motherwort
	Galium aparine	Cleavers
	Prunella vulgaris	Self-heal

Notes: Lowland hardwood forest. Ground layer severely disturbed. Overstory comprised of a mix of mature lowland hardwood species. Located along Nine Mile Creek. Openings dominated by invasive Reed Canary grass. Invasive Buckthorn, Honeysuckle and Garlic mustard all present.

Natural Polygon ID	27B	MLCCS Code	32112
Community Description	Oak woodland-brushland	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 411-4, 410-2
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Celtis occidentalis*	Hackberry
	Quercus macrocarpa	Bur oak
	Quercus rubra	Red Oak
	Quercus rubra	Northern red oak
Subcanopy	*Celtis occidentalis*	Hackberry
	Vitis riparia	Riverbank grape
	Juniperus virginiana	Eastern Red Cedar
	Juglans nigra	Black Walnut
Shrubs	*Celtis occidentalis*	Hackberry
	Lonicera tatarica	Tartarian honeysuckle
	Rhamnus cathartica	Common buckthorn
	Rubus idaeus var. strigosus	Red raspberry
	Sambucus canadensis	Common Elder
	Zanthoxylum americana	Prickley Ash
Ground	*Arisaema triphyllum*	Jack-in-the-pulpit
	Alliaria petiolata	Garlic mustard
	Aster cordifolius	Heart-leaved aster
	Geocaulon livida	Northern comandra
	Carex blanda	Charming sedge
	Eupatorium rugosum	White snakeroot
	Impatiens capensis	Spotted Touch-me-not
	Phryma leptostachya	Lopseed
	Arcteum minus	Common Burdock
	Smilacina racemosa	False Solomon's Seal
	Fragaria vesca	Woodland Strawberry
	Carex ovales type	Ovales Type Sedge
	Osmorhiza longisylis	Aniseroot
	Carex rosea	Starry Sedge
	Hackelia virginiana	Virginia Stickseed
	Laportea canadensis	Wood Nettle
	Lactuca biennis	Biennial Blue Lettuce
	Acer negundo	Boxelder
	Parthenocissus inserta	Woodbine
	Viola spp.	Violet

Notes: Variably Disturbed Oak forest on steep slopes above Nine Mile Creek. Many open grown and forest grown oaks present. Invasive Buckthorn, Garlic Mustard and Honeysuckle common. Weeds thickest near mowed openings. Oak canopy and Subcanopy dominant though very few younger oaks noted.

Natural Polygon ID	28A	MLCCS Code	32220
Community Description	Lowland Hardwood	Quality Ranking	D
Field Check Level	4	Invasives	408-4, 412-3
Surveyor	TR	Date	5/16/2007

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Populus deltoides	Cottonwood
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Populus deltoides	Cottonwood
Shrub	*Prunus virginiana*	Common Chokecherry
	Morus alba	Mulberry
	Rhamnus cathartica	Common Buckthorn
Ground	*Smilacina racemosa*	False Solomon's Seal
	Parthenocissus inserta	Woodbine
	Amphicarpa bracteata	Hog Peanut
		Dame's Rocket
		Creeping Charlie
	Vitis riparia	Riverbank Grape
	Phalaris arundinacea	Reed Canary Grass

Notes: Lowland hardwood forest. Ground layer severely disturbed. Overstory comprised of a mix of mature floodplain forest species.

Natural Polygon ID	29A	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	C
Field Check Level	3	Invasives	408-5, 411-5, 420-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Juniperus virginiana var. virginiana*	Eastern red cedar
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Robinia pseudoacacia	Black locust
	Tilia americana	Basswood
Subcanopy	*Celtis occidentalis*	Hackberry
	Prunus virginiana	Chokecherry
Shrubs	*Rubus idaeus var. strigosus*	Red raspberry
	Rhamnus cathartica	Common buckthorn
	Sambucus racemosa	Red-berried elder
Ground	*Arisaema triphyllum*	Jack-in-the-pulpit
	Alliaria petiolata	Garlic mustard
	Aster cordifolius	Heart-leaved aster
	Campanula americana	Tall bellflower
	Carex blanda	Charming sedge
	Eupatorium rugosum	White snakeroot
	Osmorhiza claytonii	Clayton's sweet cicely
	Phryma leptostachya	Lopseed
	Sanicula marilandica	Maryland black snakeroot
	Viola spp.	Violet

Notes: Highly disturbed oak woodland with open grown Bur oaks and dense, small American elms and Common Buckthorns throughout.

Natural Polygon ID	29B	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Celtis occidentalis*	Hackberry
	Fraxinus nigra	Black ash
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
Ground	*Asarum canadense*	Wild ginger
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Elymus virginicus	Virginia wild rye

Notes: Ravine dominated by Northern red oak and Basswood. Dense Common buckthorn throughout and Black ash is restricted to small creek side seeps.

Natural Polygon ID	29C	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 410-3, 411-5
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Juglans nigra	Black walnut
	Ulmus americana	American elm
	Quercus ellipsoidalis	Northern pin oak
Subcanopy	*Acer saccharum*	Sugar maple
	Acer negundo	Box elder
	Fraxinus pennsylvanica	Green ash
	Celtis occidentalis	Hackberry
	Quercus macrocarpa	Bur oak
	Tilia americana	Basswood
	Juglans nigra	Black walnut
	Castanea dentata	American chestnut
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rubus idaeus var. strigosus	Red raspberry
	Sambucus racemosa	Red-berried elder
	Lonicera tatarica	Tartarian honeysuckle
	Ribes missouriense	Missouri gooseberry
	Smilax tamnoides	Greenbrier
Ground	*Laportea canadensis*	Wood nettle
	Alliaria petiolata	Garlic mustard
	Menispermum canadense	Canada moonseed
	Pilea spp.	Clearweed

Notes: Mesic oak forest dominated by Northern red oak, with frequent large, open-grown Bur oaks. Patchy canopy with occassionaly large Basswoods. Dense Common buckthorn and Garlic mustard throughout.

Natural Polygon ID	29D	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green ash
	Populus deltoides var. occidentalis	Cottonwood
Subcanopy	*Celtis occidentalis*	Hackberry
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
Ground	*Amphicarpaea bracteata*	Hog peanut
	Arctium minus	Common burdock
	Aster ontarionis	Ontario aster
	Carex amphibola	Ambiguous sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Elymus virginicus	Virginia wild rye
	Geum canadense	White avens
	Hackelia virginiana	Virginia stickseed
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Menispermum canadense	Canada moonseed
	Pilea spp.	Clearweed
	Scrophularia marilandica	Maryland figwort

Notes: Narrow band of floodplain forest silver maple subtype along marsh edge.

Natural Polygon ID	29F	MLCCS Code	32220
Community Description	Lowland hardwood forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 416-3, 420-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green ash
	Robinia pseudoacacia	Black locust
	Tilia americana	Basswood
Subcanopy	*Salix exigua*	Sandbar willow
	Salix x rubens	Red willow
	Ulmus pumila	Siberian elm
	Rhamnus cathartica	Common buckthorn
Ground	*Arctium minus*	Common burdock
	Aster ontarionis	Ontario aster
	Carex lacustris	Lake sedge
	Equisetum hyemale var. affine	Tall scouring rush
	Impatiens capensis	Spotted touch-me-not
	Pilea spp.	Clearweed
	Scirpus atrovirens	Dark green bulrush

Notes: Shallow ravine with narrow bottom dominated by Basswood and Green ash. Black ash free seeps on both sides of trail running down the ravine bottom. Dense Common buckthorn throughout.

Natural Polygon ID	29G	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 410-2, 411-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Acer saccharum*	Sugar maple
	Celtis occidentalis	Hackberry
	Fraxinus nigra	Black ash
	Juglans cinerea	Butternut
	Juniperus virginiana var. virginiana	Eastern red cedar
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
	Prunus virginiana	Chokecherry
	Rhamnus cathartica	Common buckthorn
Ground	*Alliaria petiolata*	Garlic mustard
	Allium tricoccum	Wild leek
	Arctium minus	Common burdock
	Carex blanda	Charming sedge
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Carex rosea	Starry sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Cryptotaenia canadensis	Honewort
	Eupatorium rugosum	White snakeroot
	Galium triflorum	Sweet-scented bedstraw
	Hackelia virginiana	Virginia stickseed
	Leersia virginica	White grass
	Osmorhiza claytonii	Clayton's sweet cicely
	Viola sororia	Common blue violet

Notes: Mesic oak forest dominated by large Northern red oaks with dense understory of Sugar maple. Densely shaded, bare soils common, with patches of dense Ironwood.

Natural Polygon ID	29H	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
Subcanopy	*Acer saccharum*	Sugar maple
	Fraxinus nigra	Black ash
	Celtis occidentalis	Hackberry
	Rhamnus cathartica	Common buckthorn
Ground	*Aster cordifolius*	Heart-leaved aster
	Carex blanda	Charming sedge
	Galium triflorum	Sweet-scented bedstraw
	Leonurus cardiaca	Common motherwort
	Phryma leptostachya	Lopseed

Notes: Oak woodland dominated by open-grown Bur oaks with young Eastern red cedars and Sugar maples. Densely shaded with bare soils common.

Natural Polygon ID	30A	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 410-2
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Salix nigra	Black Willow
	Populus deltoides var. occidentalis	Cottonwood
Subcanopy	*Acer saccharinum*	Silver maple
	Salix nigra	Black Willow
	Populus deltoides var. occidentalis	Cottonwood
	Fraxinus pennsylvanica	Green Ash
	Ulmus americana	American Elm
Shrubs	*Rhamnus cathartica*	Common Buckthorn
Ground	*Agrimonia gryposepala*	Common agrimony
	Campanula americana	Tall Bellflower
	Aster ontarionis	Ontario aster
	Cryptotaenia canadensis	Honewort
	Rudbeckia laciniata	Tall Coneflower
	Hackelia virginiana	Virginia stickseed
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Rhamnus cathartica	Common Buckthorn
	Leersia oryzoides	Rice Cut Grass
	Cicuta bulbifera	Bulb-bearing water hemlock
	Ulmus americana	American Elm
	Vitis riparia	Riverbank Grape
	Smilax herbacea	Smooth carrion flower
	Equisetum fluviatale	Water horsetail
	Eupatorium rugosum	White Snakeroot
	Elymus virginicus	Virginia Wild Rye
	Parthenocissus inserta	Woodbine

Notes: Moderate quality Silver Maple floodplain forest with large scattered Cottonwoods. Dense thickets of Wood nettle throughout with some Common Buckthorn. Highly variable stand between Minnesota River and Floodplain wetlands along bluff base.

Natural Polygon ID	30B	MLCCS Code	61720
Community Description	Mixed Emergent Marsh - Intermittently Exposed	Quality Ranking	C
Field Check Level	3	Invasives	412-3, 406-3
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Shrub	*Salix exigua*	Sandbar Wilow
	Fraxinus pennsylvanica	Green Ash
	Cornus amomum	Silky Dogwood
Ground	*Carex lacustris*	Lake sedge
	Acorus calamus	Sweet-flag
	Anemone canadensis	Canada Anemone
	Asclepias incarnata	Swamp Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh bellflower
	Carex amphibola	Ambiguous Sedge
	Carex stricta	Tussock Sedge
	Carex vulpinoidea	Fox Sedge
	Eupatorium maculatum	Spotted Joe-pye Weed
	Erigeron philadelphicus	Philadelphia fleabane
	Impatiens capensis	Spotted touch-me-not
	Leersia oryzoides var. oryzoides	Rice cut grass
	Leersia virginica	White grass
	Lycopus americanus	Cut-leaved Bugleweed
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad-leaved Arrowhead
	Scirpus acutus	Hardstem Bulrush
	Scirpus atrovirens	Dark green bulrush
	Scutellaria lateriflora	Mad Dog Skullcap
	Solidago gigantea	Giant Goldenrod
	Sparganium eurycarpum	Giant Bur-reed
	Stachys palustris	Woundwort
	Thelyptris palustris	Marsh Fern
	Typha x glauca	Hybrid Cattail

Notes: Emergent Marsh with shrub component located in former Minnesota River channel. Diverse mix of forbs present with some Reed Canary Grass and Hybrid Cattail present. Shrubs common but scattered.

Natural Polygon ID	30C	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	D
Field Check Level	3	Invasives	412-3, 406-3
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Shrub	*Salix exigua*	Sandbar Wilow
	Fraxinus pennsylvanica	Green Ash
	Cornus amomum	Silky Dogwood
Ground	*Carex lacustris*	Lake sedge
	Acorus calamus	Sweet-flag
	Anemone canadensis	Canada Anemone
	Asclepias incarnata	Swamp Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh bellflower
	Carex amphibola	Ambiguous Sedge
	Carex stricta	Tussock Sedge
	Carex vulpinoidea	Fox Sedge
	Eupatorium maculatum	Spotted Joe-pye Weed
	Erigeron philadelphicus	Philadelphia fleabane
	Impatiens capensis	Spotted touch-me-not
	Leersia oryzoides var. oryzoides	Rice cut grass
	Leersia virginica	White grass
	Lycopus americanus	Cut-leaved Bugleweed
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad-leaved Arrowhead
	Scirpus acutus	Hardstem Bulrush
	Scirpus atrovirens	Dark green bulrush
	Scutellaria lateriflora	Mad Dog Skullcap
	Solidago gigantea	Giant Goldenrod
	Sparganium eurycarpum	Giant Bur-reed
	Stachys palustris	Woundwort
	Thelyptris palustris	Marsh Fern
	Typha x glauca	Hybrid Cattail

Notes: Sandbar willow dominated wet meadow located in former Minnesota River channel. Adjacent to with same species mix as 30B, but with Sandbar willow dominant. Diverse mix of forbs present with some Reed Canary Grass and Hybrid Cattail present.

Natural Polygon ID	30D	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	D
Field Check Level	3	Invasives	408-2, 420-3
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides var. occidentalis*	Cottonwood
Subcanopy	*Acer negundo*	Boxelder
	Robinia pseudoacacia	Black Locust
	Populus deltoides var. occidentalis	Cottonwood
	Fraxinus pennsylvanica	Green Ash
Shrubs	*Rhamnus cathartica*	Common Buckthorn
Ground	*Elymus virginicus*	Virginia Wild Rye
	Fraxinus pennsylvanica	Green Ash
	Hackelia virginiana	Virginia stickseed
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Parthenocissus inserta	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Rudbeckia laciniata	Tall Coneflower

Notes: Floodplain forest with large scattered Cottonwoods. Lots of Black Locust in understory. Much bare soil. Some Common Buckthorn.

Natural Polygon ID	30E	MLCCS Code	61620
Community Description	Mixed emergent marsh	Quality Ranking	C
Field Check Level	3	Invasives	402-2, 406-2
Surveyor	FH	Date	7/31/2006

Location	Scientific Name	Common Name
Ground	*Acorus calamus*	Sweet Flag
	Lythrum salicaria	Purple loosestrife
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus fluviatilis	River bulrush
	Sparganium eurycarpum	Giant Bur Reed
	Typha angustifolia	Narrow-leaved cattail

Notes: Dense marsh of River bulrush, with occassinal individuals of Purple loosestrife and Broad-leaved arrowhead. Low density of Narrow-leaved cattail.

Community Plant Species Lists

Area	31A	**MLCCS Code**	32211
Community Description	Floodplain forest Silver maple subtype	**Quality Ranking**	D
Field Check Level	3	**Invasives**	408-2, 412-5
Surveyor	TR	**Date**	7/15/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green ash
	Salix nigra	Black willow
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Ground	*Aster ontarionis*	Ontario aster
	Bidens sp.	Beggarticks
	Carex lacustris	Lake sedge
	Elymus virginicus	Virginia wild rye
	Equisetum pratense	Meadow horsetail
	Eupatorium maculatum	Spotted Joe pye weed
	Impatiens capensis	Spotted touch-me-not
	Phalaris arundinacea	Reed canary grass
	Pilea sp.	Clearweed

Notes: Floodplain forest Silver maple subtype characterized comprised of mostly young Silver maple with a few scattered large individuals. Reed Canary grass dominates near openings.

Natural Polygon ID	32A	MLCCS Code	32211
Community Description	Floodplain forest silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	412-2
Surveyor	TR	Date	7/15/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green ash
	Acer negundo	Boxelder
	Salix nigra	Black Willow
	Populus deltoides var. occidentalis	Cottonwood
Subcanopy	*Fraxinus pennsylvanica*	Green ash
	Acer negundo	Boxelder
	Acer saccharinum	Silver maple
	Ulmus americana	American elm
Shrubs	*Fraxinus pennsylvanica*	Green ash
	Vitis riparia	Riverbank Grape
Ground	*Amphicarpaea bracteata*	Hog peanut
	Arctium minus	Common burdock
	Carex amphibola	Ambiguous sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Elymus virginicus	Virginia wild rye
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Lycopus americanus	Cut-leaved Bugleweed
	Mentha arvensis	Common Mint
	Parthenocissus inserta	Woodbine
	Pilea spp.	Clearweed
	Scuttelaria lateriflora	Mad Dog Skullcap
	Sicyos angulatus	Bur Cucumber
	Ulmus americana	American elm
	Vernonia fasciculata	Ironweed

Notes: Narrow band of floodplain forest silver maple subtype between marsh edge and Minnesota River. Few shrubs present.

Natural Polygon ID	33A	MLCCS Code	61210
Community Description	Dry Prairie, Barrens Subtype	Quality Ranking	A
Field Check Level	4	Invasives	416-2, 409-2, 413-2, 407-2 Kentucky Bluegrass
Surveyor	TR	Date	6/14/2007

Canopy	*Ulmus pumila*	Siberian Elm
	Juniperus virginiana	Eastern Red Cedar
Subcanopy	*Ulmus pumila*	Siberian Elm
Shrub	*Populus tremuloides*	Quaking Aspen
Ground	*Achillea millefolium*	Yarrow
	Amorpha canescens	Leadplant
	Andropogon gerardii	Big Bluestem
	Anemone cylindrica	Long Headed Thimbleweed
	Antennaria neglecta	Field Pussytoes
	Asclepias tuberosa	Butterfly Milkweed
	Aster cordifolius	Heart-leaved Aster
	Aster laevis	Smooth Aster
	Bromus inermis	Smooth Brome
	Bromus sp.	Brome species
	Carex richardsonii	Richardson's Sedge
	Carex sp. (*ovales type)*	A type of Sedge
	Coreopsis palmata	Prairie Coreopsis
	Coronilla varia	Crown Vetch
	Dalea candida	White Prairie Clover
	Dalea purpurea	Purple Prairie Clover
	Equisetum sp.	Horsetail species
	Erigeron philidelphicus	Philidelphia Fleabane
	Euphorbia esula	Leafy Spurge
	Fragaria virginiana	Wild Strawberry
	Geranium maculatum	Wild geranium
	Geum triflorum	Prairie Smoke
	Lespedeza capitata	Round Headed Bushclover
	Liatris sp.	Blazing Star
	Lithospermum canescens	Hoary Puccoon
	Lupinus perennis	Wild Lupine
	Melilotus sp.	Sweet Clover
	Modarda fistulosa	Wild Bergamot
	Panicum oligosanthes	Scribner's Panic Grass
	Parthenocissus inserta	Woodbine
	Poa pratensis	Kentucky bluegrass
	Rudbeckia hirta	Black-eyed Susan
	Schizachyrium scoparium	Little Bluestem
	Sisyrinchium campestre	Field Blue-eyed Grass
	Solidago canadensis	Canada Goldenrod
	Solidago rigida	Stiff Goldenrod
	Sorghastrum nutans	Indian Grass

Natural Polygon ID	33A	**MLCCS Code**	61211
	Sporobilis heterolepis	Prairie Dropseed	
	Stipa spartea	Porcupine Grass	
	Toxicodendron radicans	Poison Ivy	
	Tradescantia occidentalis	Western Spiderwort	
	Verbascum thapsus	Common Mullein	

Notes: Maintained prairie by burning, with natives prairie species dominant throughout. Invasive species present, but none problematic. Very diverse prairie mix of grass and forbs. Low grasses dominant with tall grass species present throughout. Forb mix very diverse. Invasive Siberian Elm and Eastern Red Cedar present throughout, but appear to be under control based on management practices.

Natural Polygon ID	33B	**MLCCS Code**	61451
Community Description	Poor fen sedge subtype	**Quality Ranking**	B
Field Check Level	2	**Invasives**	
Surveyor	TR	**Date**	6/14/2007

Location	Scientific Name	Common Name
Canopy	*Acer sacharinum*	Silver Maple
	Fraxinus pennsylvanica	Green Ash
Shrub	*Salix petiolaris*	Marsh Willow
	Cornus serecia	Red Osier Dogwood
	Ulmus americana	American Elm
Ground	*Carex lacustris*	Lake Sedge
	Asclepias incarnata	Marsh Milkweed
	Lemna minor	Lesser Duckweed
	Matteuccia struthiopteris (cf.)	Ostrich Fern
	Theliptis palustris	Marsh Fern
	Iris versicolor	Blue Flag Iris
	Carex sp.	Carex species
	Lycopus americana	Water Horehound
	Lythrum salicaria	Purple Loosestrife
	Carex retrorsa	Retrorse Sedge
	Sagitarria latifolia	Broad Leaved Arrowhead
	Glyceria grandis	Tall manna Grass
	Impatiens capensis	Spotted Touch-me-not
	Cicuta sp.	Water Hemlock species
	Onoclea sensibilis	Sensitive Fern
	*Carex tenera (*cf)	Marsh Straw Sedge
	*Carex lasiocarpa (*cf)	Wiregrass Sedge

Notes: Floating center island located in isolated depression. Depression is surrounded by moat, and inaccessible by foot. Floating mat protected from surrounding backyards (mowed to water) by 6'-12' wide moat. Site not visited, but species diversity appears very high with minimal invasive species present.

Natural Polygon ID	34A	MLCCS Code	61820
Community Description	Mixed Emergent Marsh - Permanently Flooded	Quality Ranking	C
Field Check Level	4	Invasives	
Surveyor	TR	Date	6/29/2007

Location	Scientific Name	Common Name
Ground	*Lemna Minor*	Lesser Duckweed
	Sagittaria rigida	

Notes: Single species emergent community of *Sagittaria rigida.* No species diversity, but dominated entirely by native species.

Natural Polygon ID	35A	MLCCS Code	61520
Community Description	Mixed Emergent Marsh - Seasonally Flooded	Quality Ranking	B
Field Check Level	4	Invasives	412-1
Surveyor	TR	Date	6/29/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake Sedge
	Asclepias incarnata	Marsh Milkweed
	Scirups fluviatalis	River Bulrush
	Mimulus ringens	Monkey Flower
	Mentha arvensis	Common Mint
	Galium labradorium	
	Polygonum amphibium	Water Smartweed
	Verbena hastata	Blue Vervain
	Impatiens capensis	Spotted Touch-me-not
		Poison Nightshade
	Potentilla sp.	Cinquefoil
	Carex utriculata	Beaked Sedge

Notes: Small isolated wetland depression with backyards on upper slope and protected/disturbed forest on lower side. Not particularly diverse species composition. Entire basin dominated by Lake Sedge with a smaller patch of River Bulrush. Virtually no invasive/non-native species noted except for a handful of Reed Canary Grass clumps.

Natural Polygon ID	35B	**MLCCS Code**	61451
Community Description	Poor fen sedge subtype	**Quality Ranking**	B
Field Check Level	4	**Invasives**	408-3(Glossy Buckthorn)
Surveyor	TR	**Date**	6/29/2007

Location	Scientific Name	Common Name
Canopy	*Betula papyrifera*	Paper Birch
	Populus tremuloides	Quaking Aspen
Subcanopy	*Rhamnus frangula*	Glossy Buckthorn
Shrub	*Acer ginnala*	Amur Maple
	Alnus incana(cf)	Speckled Alder
	Cornus serecia	Red Osier Dogwood
	Fraxinus pennsylvanica	Green Ash
	Rhamnus frangula	Glossy Buckthorn
	Salix pedicullaris	Bog Willow
	Salix petiolaris	Meadow Willow
	Spiraea tomentosa	Steeplebush
	Viburnum rafinesquianum	Arrowood Viburnum
Ground	*Carex lacustris*	Lake Sedge
	Alisma plantago-aquatica	Water Plantain
	Apocynum cannabinum (sibericum)	Spreading Dogbane
	Asclepias incarnata	Marsh Milkweed
	Carex lasiocarpa	Wiregrass Sedge
	Carex sp.	Carex species
	*Carex tenera (*cf)	Marsh Straw Sedge
	Carex vulpinoidea	Fox Sedge
	Dryopteris cristata	Crested Fern
	Eriophorum gracile	Slender cottongrass
	Eupatorium maculatum	Spotted Joe-pye-weed
	Eupatorium perfoliatum	Boneset
	Galium tinctorum	Small Bedstraw
	Glyceria grandis	Tall manna Grass
	Glyceria striata	Fowl manna Grass
	Impatiens capensis	Spotted Touch-me-not
	Iris versicolor	Blue Flag Iris
	Lemna minor	Lesser Duckweed
	Lycopus americana	Water Horehound
	Lysimachia thrysiflorum	Tufted Loosestrife
	Menyanthes trifoliata	Buckbean

Natural Polygon ID	35B	**MLCCS Code**	61452
	Parthenocissus inserta	Woodbine	
	Polygonum sagittatum	Arrow-leaved Tearthumb	
	Potentilla palustris	Marsh Cinquefoil	
	Sagitarria latifolia	Broad Leaved Arrowhead	
	Scuttelaria galericulata	Marsh Skullcap	
	Solidago uliginosa	Bog Goldenrod	
	Sphagnum	Sphagnum Moss	
	Theliptis palustris	Marsh Fern	
	Toxicodendron radicans	Poison Ivy	
	Triadenum fraseri	St. John's Wort	
	Vaccinium macrocarpon	Large Cranberry	

Notes: High quality poor fen with very high species diversity. Significant invasion by glossy buckthorn throughout. Stormwater inputs from adjacent roads and development appear to have little effect on species richness or hydrology. Lower than highest rating due to presence of invasive shrub species.

Natural Polygon ID	37A	**MLCCS Code**	32113
Community Description	Oak Forest Dry Subtype	**Quality Ranking**	D
Field Check Level	3	**Invasives**	408-2, 411-4
Surveyor	TR	**Date**	5/22/2007

Canopy	*Quercus macrocarpa*	Bur Oak
	Ulmus americana	American Elm
	Acer negundo	Boxelder
	Acer saccharinum	Silver Maple
	Fraxinus pennsylvanica	Green Ash
Subcanopy	*Acer negundo*	Boxelder
Shrub	*Rhamnus cathartica*	Common Buckthorn
Ground	*Alliaria petiolaria*	Garlic Mustard
	Amphicarpaea bracteata	Hog Peanut
	Parthenocissus inserta	Woodbine
	Fraxinus pennsylvanica	Green Ash
	Acer negundo	Boxelder
	Rhamnus cathartica	Common Buckthorn

Notes: Poor quality, small remnant hardwood forest with Buckthorn common thorughout. Isolated within back lots of residential community.

Natural Polygon ID	37B	MLCCS Code	32112
Community Description	Oak forest mesic subype	Quality Ranking	C
Field Check Level	3	Invasives	408-4,411-4
Surveyor	TR	Date	7/1/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Juniperus virginiana	Eastern Red Cedar
	Pinus resinosa	Planted Red Pin
	Acer Saccharum	Sugar Maple
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
	Prunus virginiana	Chokecherry
	Rhamnus cathartica	Common buckthorn
Shrubs	*Cornus alternifolia*	Pagoda dogwood
	Ribes cynosbati	Prickly gooseberry
Ground	*Asarum canadense*	Wild ginger
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Rhamnus cathartica	Common buckthorn
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf

Notes: Large ravine comprised of mesic oak forest dominated by Northern red oak, Bur oak, and Basswood. Ironwood dominant in portions of understory. Highly variable with variable maintenance. Buckthorn common throughout. C rank given based on size of polygons, and presence of many large canopy oaks.

Natural Polygon ID	37C	MLCCS Code	32220
Community Description	Lowland hardwood	Quality Ranking	D
Field Check Level	3	Invasives	408-4, 412-2
Surveyor	TR	Date	7/1/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharum*	Sugar maple
	Celtis occidentalis	Hackberry
	Juniperus virginiana	Eastern red cedar
	Populus deltoides	Cottonwood
	Salix nigra	Black Willow
	Tilia americana	Basswood
Subcanopy	*Acer saccharum*	Sugar maple
	Celtis occidentalis	Hackberry
	Juniperus virginiana	Eastern red cedar
	Juglans nigra	Black Walnut
	Ostrya virginiana	Ironwood
	Populus deltoides	Cottonwood
	Rhamnus cathartica	Common buckthorn
	Salix nigra	Black Willow
	Tilia americana	Basswood
Shrubs	*Cornus racemosa*	Gray dogwood
	Cornus serecia	Red Osier Dogwood
	Fraxinus pennsylvanica	Green Ash
	Ribes missouriense	Missouri gooseberry
	Ulmus pumila	Siberian Elm
Ground	*Acer saccharum*	Sugar maple
	Asarum canadense	Wild ginger
	Carex emoryi (cf)	Riverbank Sedge
	Echinacea purpurea	Purple Coneflower
	Equisetum fluviatale	Water Horsetail
	Geum canadense	White avens
	Hydrophyllum virginianum	Virginia waterleaf
	Laportea canadensis	Wood nettle
	Phalaris arundinacea	Reed canary grass
	Poa pratensis	Kentucky Bluegrass
	Ribes cynosbati	Prickley gooseberry
	Rudbeckia laciniata	Tall Coneflower
	Solidago flexicaulis	Zigzag goldenrod

Notes: Lowland hardwood forest dominated by Green ash and Basswood. Planted pines and herbaceous material scattered. Reed Canary common at edges near Nine Mile Creek. Common Buckthorn common throughout.

Natural Polygon ID	37D	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharum*	Sugar maple
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Acer saccharum*	Sugar maple
	Celtis occidentalis	Hackberry
	Fraxinus nigra	Black ash
	Prunus serotina	Black Cherry
	Ostrya virginiana	Ironwood
	Tilia americana	Basswood
Shrubs	*Ribes americanum*	Wild Black Current
	Prunus virginiana	Chokecherry
	Rhamnus cathartica	Common buckthorn
Ground	*Solidago flexicaulis*	Zigzag Goldenrod
	Quercus rubra	Northern red oak
	Asarum canadense	Wild Ginger
	Carex blanda	Charming sedge
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Atherium felix-femina	Lady Fern
	Dryopteris carthusiana	Spinulose Oak Fern
	Trillium sp.	Trillium Species
	Arisaema triphyllum	Jack in the Pulpet
	Rudbeckia laciniata	Tall Coneflower
	Equisetum fluviatale	Water Horsetail

Notes: Former oak forest, now with a continuous canopy of Sugar Maple in subcanopy and more than 50% coverage in canopy. Overstory has a few large remnant oaks. Deep shade with minimal ground layer vegetation. Sandy soils with many bare areas. Virtually no ground layer Maples present. Black Ash Seepages present within this stand.

Natural Polygon ID	37E	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	B
Field Check Level	4	Invasives	406-2
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Green ash
	Acer saccharum	Sugar Maple
Shrub	*Rhamnus cathartica*	Common buckthorn
	Ribes americanum	Wild Black Currant
	Prunus serotina	Black Cherry
Ground	*Asarum canadense*	Wild Ginger
	Hedera helix (cf.)	English Ivy
	Equisetum fluviatale	River Horsetail
	Arisaema triphyllum	Jack-in-the-Pulpet
	Symplocarpus foetidus	Skunk Cabbage
	Laportea canadensis	Wood Nettle
	Circaea luteteana	Enchanter's Nightshade
	Carex sp.	A Sedge Species
	Impatiens capensis	Spotted touch-me-not
	Solanum dulcamara	Bittersweet Nightshade

Notes: Good quality black ash swamp located in deep shade of Oak/Sugar Maple forest. Skunk cabbage dominates ground layer. Very few invasives, though minimal diversity deep in transitional forest.

Natural Polygon ID	37F	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	B
Field Check Level	4	Invasives	406-2
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green ash
	Acer saccharum	Sugar Maple
Shrub	*Rhamnus cathartica*	Common buckthorn
	Ribes americanum	Wild Black Currant
	Sambucus canadensis	Common Red Elder
	Prunus serotina	Black Cherry
Ground	*Arisaema triphyllum*	Jack-in-the-Pulpet
	Asarum canadense	Wild Ginger
	Hydrophyllum virginianum	Virginia waterleaf
	Sphagnum sp.	Sphagnum moss
	Carex sp.	A Sedge Species
	Circaea luteteana	Enchanter's Nightshade
	Equisetum fluviatale	River Horsetail
	Hedera helix (cf.)	English Ivy
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood Nettle
	Rudbeckia laciniata	Tall Conflower
	Solanum dulcamara	Bittersweet Nightshade
	Symplocarpus foetidus	Skunk Cabbage

Notes: Good quality black ash swamp located in deep shade of Oak/Sugar Maple forest. Skunk cabbage dominates ground layer. Very few invasives, though minimal diversity deep in transitional forest.

Natural Polygon ID	37G	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	B
Field Check Level	4	Invasives	406-2
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green ash
	Acer saccharum	Sugar Maple
Shrub	*Rhamnus cathartica*	Common buckthorn
	Ribes americanum	Wild Black Currant
	Sambucus canadensis	Common Red Elder
	Prunus serotina	Black Cherry
Ground	*Arisaema triphyllum*	Jack-in-the-Pulpet
	Asarum canadense	Wild Ginger
	Hydrophyllum virginianum	Virginia waterleaf
	Sphagnum sp.	Sphagnum moss
	Carex sp.	A Sedge Species
	Circaea luteteana	Enchanter's Nightshade
	Equisetum fluviatale	River Horsetail
	Hedera helix (cf.)	English Ivy
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood Nettle
	Rudbeckia laciniata	Tall Conflower
	Solanum dulcamara	Bittersweet Nightshade
	Symplocarpus foetidus	Skunk Cabbage

Notes: Good quality black ash swamp located in deep shade of Oak/Sugar Maple forest. Skunk cabbage dominates ground layer. Very few invasives, though minimal diversity deep in transitional forest.

Natural Polygon ID	37H	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	B
Field Check Level	4	Invasives	406-2
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green ash
	Acer saccharum	Sugar Maple
Shrub	*Rhamnus cathartica*	Common buckthorn
	Ribes americanum	Wild Black Currant
	Prunus serotina	Black Cherry
Ground	*Asarum canadense*	Wild Ginger
	Hedera helix (cf.)	English Ivy
	Equisetum fluviatale	River Horsetail
	Arisaema triphyllum	Jack-in-the-Pulpet
	Symplocarpus foetidus	Skunk Cabbage
	Laportea canadensis	Wood Nettle
	Circaea luteteana	Enchanter's Nightshade
	Carex sp.	A Sedge Species
	Impatiens capensis	Spotted touch-me-not
	Solanum dulcamara	Bittersweet Nightshade

Notes: Good quality black ash swamp located in deep shade of Oak/Sugar Maple forest. Skunk cabbage dominates ground layer. Very few invasives, though minimal diversity deep in transitional forest.

Natural Polygon ID	37I	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	B
Field Check Level	4	Invasives	408-3, 412-2
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Green ash
	Malus sp.	Planted Apple
	Tilia americana	Basswood
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Asarum canadense*	Wild Ginger
	Eupatorium maculatum	Spotted Joe-pye-weed
	Caltha palustris	Marsh Marigold
	Carex comosa	Bottlebrush Sedge
	Vitis riparia	Riverbank Grape
	Iris versicolor	Northern Blue Flag Iris
	Arisaema triphyllum	Jack-in-the-pulpet
	Glyceria striata	Fowl manna Grass
	Rudbeckia laciniata	Tall Coneflower
	Equisetum fluviatale	River Horsetail
	Arisaema triphyllum	Jack-in-the-Pulpet
	Symplocarpus foetidus	Skunk Cabbage
	Laportea canadensis	Wood Nettle
	Carex sp.	A Sedge Species
	Impatiens capensis	Spotted touch-me-not
	Aster novae-angleae	New England Aster

Notes: Good quality black ash swamp located located downslope of open seepage. Seep continues into Black ash swamp where Reed Canary grass fades in shade. Buckthorn present. Planted Apples present, though senescing.

Natural Polygon ID	37J	MLCCS Code	63210
Community Description	Seepage meadow	Quality Ranking	D
Field Check Level	4	Invasives	412-4
Surveyor	TR	Date	7/6/2007

Location	Scientific Name	Common Name
Ground	*Sium suave*	Water Parsnip
	Symplocarpus foetidus	Skunk Cabbage
	Phalaris arundiacea	Reed Canary Grass
	Urtica dioica	Stinging Nettle
	Carex lacustris	Lake Sedge
	Impatiens capensis	Spotted touch-me-not
	Carex sp.	Unk. Sedge

Notes: Poor quality seepage meadow dominated by reed canary grass.

Natural Polygon ID	38A	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	CD
Field Check Level	3	Invasives	408-5, 411-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Northern red oak
Subcanopy	*Ostrya virginiana*	Ironwood
	Tilia americana	Basswood
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rubus idaeus var. strigosus	Red raspberry
Ground	*Alliaria petiolata*	Garlic mustard
	Arctium minus	Common burdock
	Campanula americana	Tall bellflower
	Carex blanda	Charming sedge
	Carex penslyvanica var. pensylvanica	Pennsylvania sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Eupatorium rugosum	White snakeroot
	Galium triflorum	Sweet-scented bedstraw
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Leonurus cardiaca	Common motherwort
	Osmorhiza claytonii	Clayton's sweet cicely

Natural Polygon ID	38A	MLCCS Code	32112
	Phryma leptostachya	Lopseed	
	Sanicula marilandica	Maryland black snakeroot	

Notes: Mesic oak forest dominated by Northern red oak in matrix of young subcanopy trees.

Natural Polygon ID	38B	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Juniperus virginiana var. virginiana	Eastern red cedar
Subcanopy		
Shrub	*Rhamnus cathartica*	Common buckthorn

Notes: Oak woodland dominated by open-grown Bur oaks.

Natural Polygon ID	38C	MLCCS Code	61540
Community Description	Wet meadow - seasonally flooded	Quality Ranking	C
Field Check Level	3	Invasives	412-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake sedge
	Eupatorium perfoliatum var. perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Leersia oryzoides var. oryzoides	Rice cut grass
	Leersia virginica	White grass
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed
	Scirpus atrovirens	Dark green bulrush

Notes: Seep in ravine bottom dominated by Spotted touch-me-not and Dark green bulrush.

Natural Polygon ID	38D	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	408-5
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Populus deltoides var. occidentalis*	Cottonwood
	Salix nigra	Black willow
	Ulmus americana	American elm
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Sicyos angulatus	Bur cucumber
	Vitis riparia	Wild grape
Ground	*Arctium minus*	Common burdock
	Arisaema triphyllum	Jack-in-the-pulpit
	Aster ontarionis	Ontario aster
	Carex amphibola	Ambiguous sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Cryptotaenia canadensis	Honewort
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Parthenium integrifolium	Wild quinine
	Pilea sp.	Clearweed
	Rudbeckia laciniata var. laciniata	Tall coneflower
	Sanicula marilandica	Maryland black snakeroot

Notes: Floodplain forest on shallow toe slope dominated by Cottonwoods, Black willows, and American elm. Dense thickets of Common buckthorn and Wood nettle throughout.

Natural Polygon ID	38E	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	DC
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Celtis occidentalis*	Hackberry
	Junglans cinerea	Butternut
	Juniperus virginiana var. virginiana	Eastern red cedar
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rubus idaeus var. strigosus	Red raspberry
	Symphoricarpos sp.	Snowberry
	Viburnum lentago	Nannyberry
	Zanthoxylum americanum	Prickly ash
Ground	*Aster cordifolius*	Heart-leaved aster
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Eupatorium rugosum	White snakeroot
	Sanicula marilandica	Maryland black snakeroot

Notes: Oak woodland that has been cut-over by landowner near the top of the slope, dominated by Northern red oak and Bur oak within a matrix of Eastern red cedars and dense Common buckthorn.

Natural Polygon ID	38F	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Celtis occidentalis*	Hackberry
	Juniperus virginiana var. virginiana	Eastern red cedar
	Ostrya virginiana	Ironwood

Natural Polygon ID	38F	MLCCS Code	32112
	Ulmus americana	American elm	
Shrubs	*Rhamnus cathartica*	Common buckthorn	
Ground	*Eupatorium rugosum*	White snakeroot	
	Carex pensylvanica	Pennsylvania sedge	
	Phryma leptostachya	Lopseed	
	Sanicula marilandica	Maryland black snakeroot	

Notes: Dry-mesic oak forest dominated by Northern red oak with occassional large, open-grown Bur oaks. Dense Common buckthorn thickets and bare soil common.

Natural Polygon ID	38G	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 412-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Populus deltoides var. occidentalis*	Cottonwood
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Populus tremuloides	Quaking aspen
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
Ground	*Arctium minus*	Common burdock
	Arisaema triphyllum	Jack-in-the-pulpit
	Aster ontarionis	Ontario aster
	Carex amphibola	Ambiguous sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Cryptotaenia canadensis	Honewort
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Parthenium integrifolium	Wild quinine
	Pilea sp.	Clearweed
	Rudbeckia laciniata var. laciniata	Tall coneflower
	Sanicula marilandica	Maryland black snakeroot

Notes: Floodplain forest dominated by scattered, extremely large Cottonwoods in a matrix of small subcanopy trees. Dense Common buckthorn thickets, low herb cover. Some seeps present.

Natural Polygon ID	38H	MLCCS Code	61213
Community Description	Dry prairie sand-gravel subtype	Quality Ranking	D
Field Check Level	3	Invasives	409-3, 416-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Ulmus pumila*	Siberian elm
	Fraxinus pennsylvanica	Green ash
Subcanopy	*Juniperus virginiana var. virginiana*	Eastern red cedar
Shrubs	*Amorpha canescens*	Leadplant
	Rubus idaeus var. strigosus	Red raspberry
Ground	*Bouteloua curtipendula*	Side-oats grama
	Poa compressa	Canada bluegrass
	Panicum oligosanthes	Scribner's panic grass
	Poa pratensis	Kentucky bluegrass
	Bouteloua hirsuta	Hairy grama
	Cyperus lupulinus	Slender nut sedge
	Artemisia canadensis	Canada wormwood
	Artemisia frigida	Sage wormwood
	Melilotus alba	White sweet clover
	Penstemon grandiflorus	Large-flowered beard tongue
	Ambrosia artemisiifolia	Common ragweed
	Asclepias viridiflora	Green milkweed
	Verbascum thapsus	Common mullein
	Euphorbia esula	Leafy spurge
	Lithospermum incisum	Narrow-leaved puccoon
	Verbena stricta	Hoary vervain
	Berteroa incana	Hoary alyssum
	Mirabilis hirsuta	Hairy four o'clock
	Dalea purpurea var. purpurea	Purple prairie clover

Notes: Highly degraded Dry prairie sand-gravel subtype with numerous weeds and exotics such as Leafy spurge and White sweet Clover. Soil erosion evident.

Natural Polygon ID	38I	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	DC
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Celtis occidentalis*	Hackberry
	Junglans cinerea	Butternut
	Juniperus virginiana var. virginiana	Eastern red cedar
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rubus idaeus var. strigosus	Red raspberry
	Symphoricarpos sp.	Snowberry
	Viburnum lentago	Nannyberry
	Zanthoxylum americanum	Prickly ash
Ground	*Aster cordifolius*	Heart-leaved aster
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Eupatorium rugosum	White snakeroot
	Sanicula marilandica	Maryland black snakeroot

Notes: Oak woodland dominated by Northern red oak and Bur oak within a matrix of Eastern red cedars and dense Common buckthorn.

Natural Polygon ID	38K	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	B
Field Check Level	3	Invasives	412-2, 420-2
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver Maple
	Ulmus americana	American Elm
Subcanopy	*Salix amygdaloides*	Peach-leaved Willow
	Salix petiolaris	Slender willow
Shrub	*Cornus amomum*	Silky Dogwood
Ground	*Carex lacustris*	Lake sedge
	Acorus calamus	Sweet-flag
	Asclepias incarnata	Swamp Milkweed
	Campanula aparinoides	Marsh bellflower
	Carex amphibola	Ambiguous Sedge
	Carex stricta	Tussock Sedge
	Carex vulpinoidea	Fox Sedge
	Eupatorium maculatum	Spotted Joe-pye Weed
	Eupatorium perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Leersia oryzoides var. oryzoides	Rice cut grass
	Leersia virginica	White grass
	Lycopus americanus	Cut-leaved Bugleweed
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad-leaved Arrowhead
	Scirpus acutus	Hardstem Bulrush
	Scirpus atrovirens	Dark green bulrush
	Scutellaria lateriflora	Mad Dog Skullcap
	Solidago gigantea	Giant Goldenrod
	Sparganium eurycarpum	Giant Bur-reed
	Stachys palustris	Woundwort
	Thelyptris palustris	Marsh Fern
	Typha x glauca	Hybrid Cattail

Notes: Wilow Swamp located in former Minnesota River channel. Diverse mix of forbs present with very few non-native invasive species. Shrubs and trees common throughout, but abundent openings filled with mix of wet meadow forbs and grasses. Floodplain trees scattered and stunted.

Natural Polygon ID	38J	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	408-5, 410-2
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Salix nigra	Black Willow
	Populus deltoides var. occidentalis	Cottonwood
	Fraxinus pennsylvanica	Green Ash
Subcanopy	*Acer negundo*	Boxelder
Shrubs	*Acer negundo*	Boxelder
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Agrimonia gryposepala*	Common agrimony
	Campanula americana	Tall Bellflower
	Aster ontarionis	Ontario aster
	Cryptotaenia canadensis	Honewort
	Rudbeckia laciniata	Tall Coneflower
	Hackelia virginiana	Virginia stickseed
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass

Notes: Low quality floodplain forest dominated by large scattered Cottonwoods and occasional Silver maples within matrix of small subcanopy trees. Dense thickets of Wood nettle throughout with Tartarian Honeysuckle scattered throughout. Highly variable stand.

Natural Polygon ID	38L	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	B
Field Check Level	3	Invasives	412-2
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake sedge
	Acorus calamus	Sweet-flag
	Asclepias incarnata	Swamp Milkweed
	Campanula aparinoides	Marsh bellflower
	Carex sp.	Unknown Sedge
	Carex stricta	Tussock Sedge
	Carex vulpinoidea	Fox Sedge
	Eupatorium maculatum	Spotted Joe-pye Weed
	Eupatorium perfoliatum var. perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Leersia oryzoides var. oryzoides	Rice cut grass
	Leersia virginica	White grass
	Lycopus americanus	Cut-leaved Bugleweed
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad-leaved Arrowhead
	Scirpus acutus	Hardstem Bulrush
	Scirpus atrovirens	Dark green bulrush
	Scutellaria lateriflora	Mad Dog Skullcap
	Solidago gigantea	Giant Goldenrod
	Sparganium eurycarpum	Giant Bur-reed
	Stachys palustris	Woundwort
	Thelyptris palustris	Marsh Fern
	Typha x glauca	Hybrid Cattail

Notes: High quality wet meadow with minimal invasive species. Overall high diversity in wetland with patches of monotypes of Giant Bur-Reed and Sweet Flag. Most of community is dominated by broad-leaved sedges Lake and Tussock Sedge. Shrubs and Floodplain trees encroaching in patches and from edges due to combination of removal of fire but also due to wetter conditions.

Natural Polygon ID	38M	MLCCS Code	32211
Community Description	Floodplain forest - Silver Maple Subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-5, 410-2
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Salix nigra	Black Willow
	Populus deltoides var. occidentalis	Cottonwood
Subcanopy	*Acer saccharinum*	Silver maple
	Salix nigra	Black Willow
	Populus deltoides var. occidentalis	Cottonwood
	Fraxinus pennsylvanica	Green Ash
	Ulmus americana	American Elm
Shrubs	*Rhamnus cathartica*	Common Buckthorn
Ground	*Agrimonia gryposepala*	Common agrimony
	Campanula americana	Tall Bellflower
	Aster ontarionis	Ontario aster
	Cryptotaenia canadensis	Honewort
	Rudbeckia laciniata	Tall Coneflower
	Hackelia virginiana	Virginia stickseed
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Rhamnus cathartica	Common Buckthorn
	Leersia oryzoides	Rice Cut Grass
	Cicuta bulbifera	Bulb-bearing water hemlock
	Ulmus americana	American Elm
	Vitis riparia	Riverbank Grape
	Smilax herbacea	Smooth carrion flower
	Equisetum fluviatale	Water horsetail
	Eupatorium rugosum	White Snakeroot
	Elymus virginicus	Virginia Wild Rye
	Parthenocissus inserta	Woodbine

Notes: Moderate quality Silver Maple floodplain forest with large scattered Cottonwoods. Dense thickets of Wood nettle throughout with some Common Buckthorn. Highly variable stand between Minnesota River and Floodplain wetlands along bluff base.

Natural Polygon ID	38N	MLCCS Code	61640
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	B
Field Check Level	3	Invasives	412-2
Surveyor	TR	Date	7/31/2007

Location	Scientific Name	Common Name
Ground	*Acorus calamus*	Sweet-flag
	Asclepias incarnata	Swamp Milkweed
	Carex lacustris	Lake sedge
	Carex Ovales type	Ovales type sedge
	Carex sp.	Unknown Sedge
	Cicuta bulbifera	Bulb-bearing Water Hemlock
	Eupatorium maculatum	Spotted Joe-pye Weed
	Impatiens capensis	Spotted touch-me-not
	Leersia oryzoides var. oryzoides	Rice cut grass
	Lemna minor	Lesser Duckweed
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed
	Rumex crispus	Curly Dock
	Sagittaria latifolia	Broad-leaved Arrowhead
	Scutellaria lateriflora	Mad Dog Skullcap
	Solidago gigantea	Giant Goldenrod
	Sparganium eurycarpum	Giant Bur-reed
	Typha x glauca	Hybrid Cattail

Notes: Good quality wet meadow dominated by Lake Sedge with patterned streams running throughout. Very wet community with pockets of Sweet Flag, Broad Leaved Arrowhead and River bulrush scattered among sedge dominants.

Natural Polygon ID	39A	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 411-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Ribes cynosbati	Prickly gooseberry
Ground	*Alliaria petiolata*	Garlic mustard
	Aster ontarionis	Ontario aster
	Campanula americana	Tall bellflower
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Smilacina racemosa	Common false Solomon's seal

Notes: Mesic oak forest dominated by Northern red oak and Basswood. Open canopy areas occupied with dense patches of Common buckthorn and Garlic mustard.

Natural Polygon ID	39B	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 411-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Populus deltoides var. occidentalis	Cottonwood
	Tilia americana	Basswood
Subcanopy	*Acer saccharinum*	Silver maple
	Celtis occidentalis	Hackberry
	Fraxinus nigra	Black ash
	Juglans nigra	Black walnut
	Salix x rubens	Red willow
	Tilia americana	Basswood
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rhamnus frangula	Glossy buckthorn
	Ribes cynosboti	Prickly gooseberry
	Vitis riparia	Wild grape
Ground	*Agrimonia gryposepala*	Common agrimony
	Alliaria petiolata	Garlic mustard
	Aster ontarionis	Ontario aster
	Cryptotaenia canadensis	Honewort
	Elymus virginicus	Virginia wild rye
	Geum canadense	White avens
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Phryma leptostachya	Lopseed
	Pilea spp.	Clearweed
	Ribes missouriense	Missouri gooseberry
	Thalictrum dasycarpum	Tall meadow-rue

Notes: Low quality floodplain forest dominated by large scattered Cottonwoods and occasional Silver maples within matrix of small subcanopy trees. Dense thickets of Common and Glossy buckthorn with Wood nettle throughout.

Natural Polygon ID	39C	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	411-5
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green ash
	Juglans nigra	Black walnut
	Populus deltoides var. occidentalis	Cottonwood
	Ulmus americana	American elm
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus nigra	Black ash
	Fraxinus pennsylvanica	Green ash
	Juglans cinera	Butternut
	Juglans nigra	Black walnut
	Tilia americana	Basswood
	Ulmus americana	American elm
Shrubs	*Parthenocissus vitacea*	Virginia creeper
	Vitis riparia	Wild grape
Ground	*Alliaria petiolata*	Garlic mustard
	Aster ontarionis	Ontario aster
	Carex amphibola	Ambiguous sedge
	Hackelia virginiana	Virginia stickseed
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Osmorhiza claytonii	Clayton's sweet cicely
	Pilea spp.	Clearweed
	Ranunculus abortivus	Kidney-leaved buttercup

Notes: Floodplain terrace forest dominated by Green ash, Basswood and Hackberry with scattered large Cottonwoods. Ground cover dominated by Wood nettle.

Natural Polygon ID	39D	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 410-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Juniperus virginiana var. virginiana	Eastern red cedar
Subcanopy	*Quercus rubra*	Northern red oak
	Ulmus americana	American elm
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
	Rhamnus cathartica	Common buckthorn
	Zanthoxylum americanum	Prickly ash
Ground	*Carex blanda*	Charming sedge
	Carex pensylvanica var. pennsylvanica	Pennsylvania sedge
	Eupatorium rugosum	White snakeroot
	Muhlenbergia mexicana	Mexican muhly grass

Notes: Oak woodland with scattered, open-grown Bur oaks. Numerous small trees, dense shrub layer, and sparse ground cover. Lower part of slope dominated by small Northern red oaks and Eastern red cedars.

Natural Polygon ID	39E	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Northern red oak
	Tilia americana	Basswood
Shrubs	*Rhamnus cathartica*	Common buckthorn
Ground	*Carex blanda*	Charming sedge
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Eupatorium rugosum	White snakeroot

Notes: Degraded mesic oak forest dominated by young Northern red oaks and Basswoods. Dense Common buckthorn and low diversity within the ground-cover.

Natural Polygon ID	39G	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	BC
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharum*	Sugar maple
	Fraxinus nigra	Black ash
	Fraxinus pennsylvanica	Green ash
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rhamnus frangula	Glossy buckthorn
	Ribes americanum	Wild black currant
	Viburnum trilobum	Highbush cranberry
Ground	*Angelica atropurpurea*	Angelica
	Bidens sp.	Beggarticks
	Caltha palustris	Common marsh marigold
	Carex lacustris	Lake sedge
	Carex ovales Type	A species of sedge
	Carex stricta	Tussock sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Cuscuta sp.	Dodder
	Equisetum sp.	Horsetail
	Impatiens capensis	Spotted touch-me-not
	Iris virginica var. shrevei	Southern blue flag
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Lilium michiganense	Michigan lily
	Lysimachia thyrsiflora	Tufted loosestrife
	Onoclea sensibilis	Sensitive fern
	Pilea sp.	Clearweed
	Rubus pubescens	Dwarf raspberry
	Rudbeckia laciniata	Tall coneflower
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus atrovirens	Dark green bulrush
	Scutellaria lateriflora	Mad dog skullcap
	Sium suave	Water parsnip
	Smilacina stellata var. stellata	Starry false Solomon's seal
	Symplocarpus foetidus	Skunk cabbage
	Toxicodendron radicans	Poison ivy

Notes: Black ash seep on the toe slope dominated by young to mid-size Black ash. Dense thickets of buckthorn, but high diversity ground-cover.

Natural Polygon ID	39H	MLCCS Code	32311
Community Description	Black ash swamp seepagesubtype	Quality Ranking	BC
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharum*	Sugar maple
	Fraxinus nigra	Black ash
	Fraxinus pennsylvanica	Green ash
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Rhamnus frangula	Glossy buckthorn
	Ribes americanum	Wild black currant
	Viburnum trilobum	Highbush cranberry
Ground	*Angelica atropurpurea*	Angelica
	Bidens sp.	Beggarticks
	Caltha palustris	Common marsh marigold
	Carex lacustris	Lake sedge
	Carex ovales Type	A species of sedge
	Carex stricta	Tussock sedge
	Circaea lutetiana var. canadensis	Common enchanter's nightshade
	Cuscuta sp.	Dodder
	Equisetum sp.	Horsetail
	Impatiens capensis	Spotted touch-me-not
	Iris virginica var. shrevei	Southern blue flag
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Lilium michiganense	Michigan lily
	Lysimachia thyrsiflora	Tufted loosestrife
	Onoclea sensibilis	Sensitive fern
	Pilea sp.	Clearweed
	Rubus pubescens	Dwarf raspberry
	Rudbeckia laciniata var. laciniata	Tall coneflower
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus atrovirens	Dark green bulrush
	Scutellaria lateriflora	Mad dog skullcap
	Sium suave	Water parsnip
	Smilacina stellata var. stellata	Starry false Solomon's seal
	Symplocarpus foetidus	Skunk cabbage
	Toxicodendron radicans	Poison ivy

Notes: Black ash seep on the toe slope dominated by young to mid-size Black ash. Dense thickets of buckthorn, but high diversity ground-cover.

Natural Polygon ID	41A	MLCCS Code	61420
Community Description	Wet Meadow - Saturated Soils	Quality Ranking	D
Field Check Level	4	Invasives	412-4
Surveyor	TR	Date	6/29/2007

Location	Scientific Name	Common Name
Ground	*Apocynum androsaemifolium*	Spreading Dogbane
	Carex bebbii	Bebb's Sedge
	Carex lacustris	Lake sedge
	Carex tenera	Marsh Straw Sedge
	Carex utriculata	Beaked Sedge
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum var. perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Leersia virginica	White grass
	Phalaris arundinacea	Reed canary grass
	Rumex crispus	Curly Dock
	Scirpus fluviatalis	River Bulrush
	Urtica dioica	Stinging Nettle
	Vernonia fasciculata	Bunched Ironweed

Notes: Wet meadow located in city park. Opening in disturbed, maintained forested area between yards and park area. Reed Canary grass dominant at margins.

Natural Polygon ID	41B	MLCCS Code	32211
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Salix nigra	Black Willow
	Populus deltoides	Cottonwood
Subcanopy	*Acer saccharinum*	Silver maple
	Ulmus americana	American elm
Shrubs	*Rhamnus cathartica*	Common Buckthorn
	Vitis riparia	Wild grape
Ground	*Campanula americana*	Tall Bellflower
	Carex amphibola	Ambiguous sedge
	Carex hystericina	Porcupine Sedge
	Elymus virginicus	Virginia Wild Rye
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia oryzoides	Rice Cut Grass
	Leersia virginica	White grass
	Pilea spp.	Clearweed
	Rudbeckia laciniata	Tall Coneflower
	Urtica dioica	Stinging Nettle

Notes: Silver maple dominated Floodplain forest. Multiple linear depressions scattered throughout. Canopy and subcanopy dominated by mixed age Silver Maple with some Black Willow and Cottonwoods present. Few invasive species. Most ground layer areas dominated by Wood Nettle.

Natural Polygon ID	41C	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	D
Field Check Level	3	Invasives	408-3
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Salix nigra	Black Willow
	Quercus macrocarpa	Bur Oak
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Juglans nigra	Black walnut
	Populus deltoides	Cottonwood
	Ulmus americana	American elm
Subcanopy	*Acer negundo*	Box elder
	Celtis occidentalis	Hackberry
	Fraxinus pennsylvanica	Green ash
	Juglans nigra	Black walnut
	Tilia americana	Basswood
	Ulmus americana	American elm
Shrubs	*Parthenocissus inserta*	Woodbine
	Rhamnus cathartica	Common Buckthorn
	Vitis riparia	Wild grape
Ground	*Andropogon gerardii*	Big Bluestem - planted near trail
	Campanula americana	Tall Bellflower
	Elymus virginicus	Virginia Wild Rye
	Carex amphibola	Ambiguous sedge
	Solidago giantea	Giant Goldenrod
	Solidago canadensis	Canada Goldenrod
	Hackelia virginiana	Virginia stickseed
	Carex hystericina	Porcupine Sedge
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Leersia virginica	White grass
	Spartina pectinata	Prairie Cordgrass - at edge
	Pilea spp.	Clearweed
	Urtica dioica	Stinging Nettle
	Rudbeckia laciniata	Tall Coneflower

Notes: Floodplain forest dominated by scattered large Cottonwoods with mix of other tree upland and floodplain forest species throughout. Openings filled with seeded trail mix (Goldenrods, Bluestem and other forbs and grasses). Shaded ground cover dominated by Wood nettle.

Natural Polygon ID	41D	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	D
Field Check Level	4	Invasives	412-4
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Ground	*Sparganium eurycarpum*	Giant Bur Reed
	Cicuta bulbifera	Bulb-bearing Water Hemlock
	Setaria veridis	Green Foxtail
	Asclepias incarnata	Marsh Milkweed
	Impatiens capensis	Spotted touch-me-not
	Echinochloa sp.	Barnyard Grass
	Phalaris arundinacea	Reed canary grass
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush
	Polygonum amphibium	Water Smartweed

Notes: Wet meadow located below freeway underpass. Small, dominated by native species with lots Reed Canary. Low quality

Natural Polygon ID	41E	MLCCS Code	61720
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	B
Field Check Level	4	Invasives	412-2, 402-2
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake Sedge
	Impatiens capensis	Spotted touch-me-not
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Polygonum amphibium	Water Smartweed
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush
	Scutellaria laterifolia	Mad Dog Skullcap
	Sonchus oleraceous	Common Sow Thistle
	Sparganium eurycarpum	Giant Bur Reed

Notes: Good quality open wet meadow community dominated by River Bulrush. Few invasives. Located under Hwy. 169 overpass.

Natural Polygon ID	41G	MLCCS Code	61720
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	B
Field Check Level	4	Invasives	412-2, 402-2
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Canopy	*Dead Silver Maples*	
Subcanopy	*Ulmus americana*	American Elm
	Acer negundo	Boxelder
	Salix nigra	Black Willow
	Acer Saccharinum	Silver Maple
Ground	*Carex lacustris*	Lake Sedge
	Convovulus arvensis	Field Bindweed
	Eupatorium maculatum	Spotted Joe-pye-weed
	Helenium autumnale	Sneezeweed
	Impatiens capensis	Spotted touch-me-not
	Lythrum salicaria	Purple Loosestrife
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Polygonum amphibium	Water Smartweed
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush
	Scutellaria laterifolia	Mad Dog Skullcap
	Sonchus oleraceous	Common Sow Thistle
	Sparganium eurycarpum	Giant Bur Reed
	Spartina pectinata	Prairie Cordgrass
	Stachys palustris	Woundwort
	Urtica dioica	Stinging Nettle
	Verbena hastata	Blue Vervain
	Vernonia fasciculata	Bunched Ironweed
	Physostegia virginiana	Obedient Plant
	Aster ontarionis	Ontario Aster

Notes: Good quality wet meadow with many flooded trees, fallen logs. Dominated by Lake Sedge

Natural Polygon ID	41N	MLCCS Code	61640
Community Description	Wet Meadow - Semipermanently Flooded	Quality Ranking	B
Field Check Level	4	Invasives	412-3, 406-3
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Shrub	*Amorpha fruticosa*	False Indigo
Ground	*Carex lacustris*	Lake sedge
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum var. perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Leersia virginica	White grass
	Phalaris arundinacea	Reed canary grass
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush
	Scutellaria laterifolia	Mad Dog Skullcap
	Stachys palustris	Marsh Hedge Nettle
	Typha x glauca	Hybrid Cattail

Notes: Good quality small wet meadow along Minnesota River backwater. Dominated by Lake Sedge with strong arrowhead component. Reed Canary and Hybrid Cattail present, but not dominant.

Natural Polygon ID	41O	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	B
Field Check Level	4	Invasives	412-3, 406-3
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Shrub	*Amorpha fruticosa*	False Indigo
Ground	*Carex lacustris*	Lake sedge
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum var. perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Leersia virginica	White grass
	Phalaris arundinacea	Reed canary grass
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush

Natural Polygon ID	41O	**MLCCS Code**	61540
	Scutellaria laterifolia	Mad Dog Skullcap	
	Stachys palustris	Marsh Hedge Nettle	
	Typha x glauca	Hybrid Cattail	

Notes: Good quality small wet meadow along Minnesota River backwater. Dominated by Lake Sedge with strong arrowhead component. Reed Canary and Hybrid Cattail present, but not dominant.

Natural Polygon ID	41P	**MLCCS Code**	61640
Community Description	Wet Meadow - Semipermanently Flooded	**Quality Ranking**	B
Field Check Level	3	**Invasives**	406-2
Surveyor	TR	**Date**	8/20/2007

Location	**Scientific Name**	**Common Name**
Canopy	*Salix nigra*	Black Willow
Shrub	*Amorpha fruticosa*	False Indigo
	Cornus serecia	Red Osier Dogwood
Ground	*Carex lacustris*	Lake sedge
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum var. perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Leersia virginica	White grass
	Phalaris arundinacea	Reed canary grass
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush
	Scutellaria laterifolia	Mad Dog Skullcap
	Stachys palustris	Marsh Hedge Nettle
	Typha x glauca	Hybrid Cattail
	Scirpus atrovirens	Dark Green Bulrush
	Carex stricta	Tussock Sedge
	Thelyptris palustris	Marsh Fern
	Sparganium eurycarpum	Giant Bur Reed
	Calamagrostis canadensis	Canada Bluejoint
	Rumex orbiculatus	Great Water Dock
	Asclepias incarnata	Marsh Milkweed

Notes: Good quality emergent wetland at base of Minnisota River valley bluff. Dominated by Lake Sedge with high diversity throughout. Shrubs present but not dominant. Reed Canary and Hybrid Cattail present, but not dominant. Black ash seepage swamp located upslope and downslope of Marsh

Natural Polygon ID	41Q	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-4, 410-3
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black Ash
Subcanopy	*Fraxinus nigra*	Black Ash
	Salix nigra	Black Willow
Shrub	*Rhamnus cathartica*	Common Buckthorn
	Lonicera tatarica	Tartarian Honeysuckle
Ground	*Impatiens capensis*	Spotted touch-me-not
	Carex lacustris	Lake Sedge
	Fraxinus pennsylvanica	Green Ash
	Toxicodendron radicans	Poison Ivy
	Arisaema triphyllum	Jack in the pulpet
	Laportea canadensis	Wood Nettle
	Eupatorium rugosum	White Snakeroot
	Amphicarpaea bracteata	Hog-peanut
	Parthenocissus inserta	Woodbine
	Elymus virginicus	Virginia Wild Rye
	Trillium sp.	Trillium

Notes: Degraded Black Ash Swamp with significant invasion by Common Buckthorn and Honeysuckle. Overstory pure Black Ash.

Natural Polygon ID	41S	MLCCS Code	61720
Community Description	Mixed emergent marsh - Intermittently Exposed	Quality Ranking	B
Field Check Level	3	Invasives	
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Sagittaria latifolia*	Broad-leaved arrowhead
	Scirpus fluviatalis	River bulrush
	Zizania palustris	Wild Rice
	Typha x glauca	Hybrid Cattail
	Carex lacustris	Lake Sedge
	Phalaris arundinacea	Reed Canary Grass
	Carex stricta	Tussock Sedge
	Carex sp.	Sedge
	Impatiens capensis	Spotted Touch-me-not
	Scuttelaria galericulata	Marsh Skullcap
	Lemna minor	Lesser Duckweed
	Urtica dioica	Stinging Nettle
	Stachys palustris	Marsh Hedge-nettle
	Sparganium eurycarpum	Giant Bur Reed
	Carex retrorsa	Retrorse Sedge - edge of woods
	Physostegia virginiana	Obedient Plant
	Lythrum salicaria	Purple Loosestrife
	Iris versicolor	Northern Blue Flag Iris

Notes: Good quality wet meadow with significant Reed Canary Grass invasion and purple loosestrife present.

Natural Polygon ID	41T	MLCCS Code	61820
Community Description	Mixed emergent marsh - Permanently Flooded	Quality Ranking	B
Field Check Level	3	Invasives	402-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Sagittaria latifolia*	Broad-leaved arrowhead
	Scirpus fluviatalis	River bulrush
	Zizania palustris	Wild Rice
	Nymphaea odorata	American White Water Lily
	Sparganium eurycarpum	Giant Bur Reed
	Lythrum salicaria	Purple Loosestrife

Notes: Intermittently exposed River Bulrush/Wild Rice dominated emergent margin of Minnesota River backwater lake. Wild Rice and Water Lily thriving during dry year, apparently more widespread than during normal years. Purple loosestrife present.

Natural Polygon ID	44A	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	D
Field Check Level	3	Invasives	406-6, 412-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green ash
	Tilia americana	Basswood
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Ground	*Aster puniceus*	Red-stemmed aster
	Carex lacustris	Lake sedge
	Impatiens capensis	Spotted touch-me-not
	Phalaris arundinacea	Reed canary grass
	Typha angustifolia	Narrow-leaved cattail

Notes: Highly degraded Blash ash seep, with no Black ash remaining presently. Northwest corner is an open seep occupied completely with Narrow-leaved cattail. Smaller seeps throughout comprised entirely of Reed canary grass, with drier areas occupied by dense thickets of Common buckthorn.

Natural Polygon ID	44C	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	D
Field Check Level	3	Invasives	
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Populus deltoides var. occidentalis*	Cottonwood
	Salix nigra	Black willow

Notes: Narrow, zone of Cottonwoods and Black willows.

Natural Polygon ID	44E	MLCCS Code	61213
Community Description	Dry prairie sandgravel subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-3, 409-2, 410-2, 413-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus ellipsoidalis*	Northern pin oak
	Rhamnus cathartica	Common buckthorn
Shrub	*Lonicera tartarica*	Tartarian honeysuckle
Ground	*Achillea millefolium*	Yarrow
	Ambrosia psilostachya	Western ragweed
	Aster sericeus	Silky aster
	Bouteloua curtipendula	Side-oats grama
	Bromus inermis	Smooth brome
	Chrysopsis villosa	Hairy golden aster
	Euphorbia esula	Leafy spurge
	Liatris punctata	Dotted blazing star
	Panicum oligosanthes	Long-leaved panic grass
	Panicum virgatum	Switchgrass
	Poa pratensis	Kentucky bluegrass
	Schizachyrium scoparium var. scoparium	Little bluestem
	Setaria viridis	Green foxtail
	Sorghastrum nutans	Indian grass

Notes: Small dry prairie sandgravel subtype dominated by Little bluestem, Side-oats grama, and Indian grass. Some Leafy spurge has invaded as well as Swithgrass from the field above. Starting to become overgrown by the tree and shrub layer.

Natural Polygon ID	44F	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Juniperus virginiana var. virginiana	Eastern red cedar
Subcanopy		
Shrubs	*Rhamnus cathartica*	Common buckthorn

Notes: Scattered, large, open-grown Bur oaks on south facing slope. Dense thickets of large and small Common buckthorn.

Natural Polygon ID	44G	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-4, 411-3, 410-2
Surveyor	TR	Date	6/29/2007

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Northern red oak
	Quercus macrocarpa	Bur Oak
	Quercus alba	White Oak
	Ulmus americana	American Elm
	Prunus serotina	Black Cherry
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
	Tilia americana	Basswood
	Acer saccharum	Sugar Maple
	Fraxinus pennsylvanica	Green Ash
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Ribes americanum	Wild Black Current
	Ribes cynosbati	Prickly gooseberry
Ground	*Alliaria petiolata*	Garlic mustard
	Rhamnus cathartica	Common buckthorn
	Circaea lutetiana	Common Enchanter's Nightshade
	Galium aparine	Cleavers
	Laportea canadensis	Wood Nettle
	Hystrix patula	Bottlebrush Grass
	Viola sp.	Violet
	Parthenocissus inserta	Woodbine
	Carex blanda	Charming Sedge
	Atherium felix-femina	Lady Fern
	Osmorhiza longistylis	Aniseroot
	Arcteum minor	Common Burdock

Notes: Mesic oak forest heavily disturbed by erosion, invasive species and past cutting. Scattered open grown oaks present throughout. Overstory dominated by Black Cherry. Deep ravine present caused by direct runoff from adjacent parking area. Parking runoff diverted through forest to lowland basin at center of polygon. Small, fragmented stand.

Natural Polygon ID	44I	MLCCS Code	61720
Community Description	Mixed emergent marsh - Intermittently Exposed	Quality Ranking	B
Field Check Level	3	Invasives	
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Sagittaria latifolia*	Broad-leaved arrowhead
	Scirpus fluviatalis	River bulrush
	Zizania palustris	Wild Rice
	Typha x glauca	Hybrid Cattail
	Carex lacustris	Lake Sedge

Notes: Intermittently exposed River Bulrush/Wild Rice dominated emergent margin of Minnesota River backwater lake. Wild Rice and Water Lily thriving during dry year, apparently more widespread than during normal years.

Natural Polygon ID	44J	MLCCS Code	61820
Community Description	Mixed emergent marsh - Permanently Flooded	Quality Ranking	B
Field Check Level	3	Invasives	
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake Sedge
	Nymphaea odorata	American White Water Lily
	Sagittaria latifolia	Broad-leaved arrowhead
	Scirpus fluviatalis	River bulrush
	Typha x glauca	Hybrid Cattail
	Zizania palustris	Wild Rice

Notes: Intermittently exposed River Bulrush/Wild Rice dominated emergent margin of Minnesota River backwater lake. Wild Rice and Water Lily thriving during dry year, apparently more widespread than during normal years.

Natural Polygon ID	45A	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 412-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black ash
	Fraxinus pennsylvanica	Green ash
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Ground	*Aster ontarionis*	Ontario aster
	Calamagrostis canadensis	Bluejoint
	Carex lacustris	Lake sedge
	Cinna arundinacea	Stout woodreed
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Phalaris arundinacea	Reed canary grass
	Pilea sp.	Clearweed
	Scirpus atrovirens	Dark green bulrush

Notes:

Natural Polygon ID	45B	MLCCS Code	61620
Community Description	Mixed emergent marsh - semipermanently flooded	Quality Ranking	B
Field Check Level	3	Invasives	412-2, 417-4, 406-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Shrub	*Salix exigua*	Sandbar Willow
Ground	*Scirpus fluviatilis*	River bulrush
	Leersia oryzoides var. oryzoides	Rice cut grass
	Phalaris arundinacea	Reed canary grass
	Pilea pumila	Dwarf clearweed
	Polygonum punctatum	Dotted smartweed

Notes: River bulrush dominated marsh with small areas of integrated Reed canary grass and Rice cut grass.

Natural Polygon ID	45C	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-3, 412-5
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green ash
	Salix nigra	Black willow
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Ground	*Aster ontarionis*	Ontario aster
	Bidens sp.	Beggarticks
	Carex lacustris	Lake sedge
	Elymus virginicus	Virginia wild rye
	Equisetum pratense	Meadow horsetail
	Eupatorium maculatum	Spotted Joe pye weed
	Impatiens capensis	Spotted touch-me-not
	Phalaris arundinacea	Reed canary grass
	Pilea sp.	Clearweed

Notes: Floodplain forest Silver maple subtype characterized by young trees comprised of Silver maples, Green ash, and Black willows. Ground-cover comprised primarily of Lake sedge, Virginia wild rye, and Reed canary grass. Seeps present.

Natural Polygon ID	45D	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Juniperus virginiana var. virginiana	Eastern red cedar
Subcanopy		
Shrubs	*Rhamnus cathartica*	Common buckthorn

Notes: Scattered, large, open-grown Bur oaks on south facing slope. Dense thickets of large and small Common buckthorn.

Natural Polygon ID	45E	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	B
Field Check Level	4	Invasives	
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Salix nigra*	Black Willow
		Scattered Dead Silver Maple
Ground	*Polygonum hydropiper*	Marsh Waterpepper
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus fluviatalis	River Bulrush

Notes: Emergent Marsh among flooded trees. Beaver activity common in the area, and may have caused floodout of Floodplain Forest. Backwater basin of Nine Mile Creek

Natural Polygon ID	45F	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	C
Field Check Level	3	Invasives	412-3
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Salix nigra*	Black Willow
Shrub	*Acer saccharinum*	Silver Maple
	Salix exigua	Sandbar Willow
Ground	*Leersia oryzoides*	Rice Cut Grass
	Asclepias incarnata	Marsh Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh Bellflower
	Carex hystericina	Porcupine Sedge
	Carex lacustris	Lake sedge
	Carex stricta	Tussock Sedge
	Cyperus esculentus	Yellow Nut Sedge
	Impatiens capensis	Spotted touch-me-not
	Iris versicolor	Northern Blue Flag Iris
	Lycopus americanus	Cut-leaved Bugleweed
	Lycopus virginicus	Virginia Bugleweed

Natural Polygon ID	45F	MLCCS Code	61540
	Mentha arvensis	Common Mint	
	Phalaris arundinacea	Reed canary grass	
	Physostegia virginica	Obedient Plant	
	Polygonum amphibium	Water Smartweed	
	Polygonum pennsylvanicum	Pennsylvania smartweed	
	Sagittaria latifolia	Broad Leaved Arrowhead	
	Scirpus cyperinus	Woolgrass	
	Scirpus fluviatalis	River Bulrush	
	Scuttellaria galericulata	Mad Dog Skullcap	
	Sium suave	Water Parsnip	
	Theliptris palustris	Marsh Fern	
	Urtica dioica	Stinging Nettle	
	Vernonia fasciculata	Bunched Ironweed	
	Xanthium strumarium	Cocklebur	

Notes: Wet meadow with high species diversity but many early successional invasives. Flooded forest evidenced by many fallen trunks buried under herbaceous material. Wet Meadow species dominate. Sandbar willow in patches scattered throughout.

Natural Polygon ID	45G	MLCCS Code	61720
Community Description	Mixed Emergent Marsh - Intermittently Exposed	Quality Ranking	B
Field Check Level	4	Invasives	
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Sagittaria latifolia*	Broad Leaved Arrowhead
	Polygonum hydropiper	Marsh Waterpepper
	Scirpus fluviatalis	River Bulrush

Notes: Emergent Marsh along edges of Mississippi River Backwater Lakes.

Natural Polygon ID	45H	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Populus deltoides	Cottonwood
Subcanopy	*Acer negundo*	Boxelder
	Acer saccharinum	Silver maple
	Fraxinus pennsylvanica	Green Ash
	Populus deltoides	Cottonwood
	Vitis riparia	Riverbank Grape
Shrub	*Rhamnus cathartica*	Common buckthorn
	Fraxinus pennsylvanica	Green Ash
Ground	*Aster ontarionis*	Ontario Aster
	Elymus virginicus	Virginia Wild Rye
	Laportea canadensis	Wood nettle
	Leersia virginica	White Grass
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common buckthorn
	Rubus sp.	Raspberry species
	Sicyos angulatus	Bur Cucumber
	Urtica dioica	Stinging Nettle
	Parthenocissus inserta	Woodbine
	Solidago flexicaulis	Zigzag Goldenrod
	Solidago gigantea	Giant Goldenrod
	Stachys palustris	Woundwort
	Physostegia virginiana	Obedient Plant
	Vitis riparia	Riverbank Grape
	Lycopus americanus	Cut-leaved Bugleweed
	Ambrosia trifida	Giant Ragweed
	Fraxinus pennsylvanica	Green Ash
	Ambrosia artemesifolia	Common Ragweed
	Rudbeckia lacineata	Tall Coneflower

Notes: Floodplain forest with equal mix of Cottonwoods and Silver Maple. Cottonwood dominant in canopy. Variable. Trail and some clear leave openings for annual weeds, though mostly continuous canopy.

Natural Polygon ID	45I	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	412-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Salix nigra*	Black Willow
	Populus deltoides	Cottonwood
	Salix exigua	Sandbar Willow
Subcanopy	*Populus deltoides*	Cottonwood
	Salix exigua	Sandbar Willow
Ground	*Asclepias incarnata*	Marsh Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh Bellflower
	Carex hystericina	Porcupine Sedge
	Carex lacustris	Lake sedge
	Carex stipata	Awl-fruited Sedge
	Carex stricta	Tussock Sedge
	Echinochloa muricata	Rough Barnyard Grass
	Galium triflorum	Sweet-scented Bedstraw
	Impatiens capensis	Spotted touch-me-not
	Leersia oryzoides	Rice Cut Grass
	Lycopus americanus	Cut-leaved Bugleweed
	Mentha arvensis	Common Mint
	Mimulus ringens	Monkey Flower
	Phalaris arundinacea	Reed canary grass
	Sicyos angulatus	Bur Cucumber
	Sium suave	Water Parsnip
	Urtica dioica	Stinging Nettle

Notes: Young, very wet forest of small caliper Black willow (trees). Disturbed overstory provides enough shading to create diverse, sedge based understory with very little Reed Canary or other invasives invasion. Ground cover dominated by Rice Cut Grass with large patches of Broad Leaved Arrowhead.

Natural Polygon ID	45J	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Populus deltoides	Cottonwood
Subcanopy	*Acer negundo*	Boxelder
	Acer saccharinum	Silver maple
	Populus deltoides	Cottonwood
	Vitis riparia	Riverbank Grape
Shrub	*Rhamnus cathartica*	Common buckthorn
	Fraxinus pennsylvanica	Green Ash
Ground	*Aster ontarionis*	Ontario Aster
	Elymus virginicus	Virginia Wild Rye
	Fraxinus pennsylvanica	Green Ash
	Laportea canadensis	Wood nettle
	Leersia virginica	White Grass
	Lycopus americanus	Cut-leaved Bugleweed
	Parthenocissus inserta	Woodbine
	Physostegia virginiana	Obedient Plant
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common buckthorn
	Rubus sp.	Raspberry species
	Rudbeckia lacineata	Tall Coneflower
	Sicyos angulatus	Bur Cucumber
	Solidago flexicaulis	Zigzag Goldenrod
	Solidago gigantea	Giant Goldenrod
	Stachys palustris	Woundwort
	Urtica dioica	Stinging Nettle
	Vitis riparia	Riverbank Grape

Notes: Floodplain forest with Silver Maple dominant. Sugar Maple dominant in canopy. Variable. Trail and some clear leave openings for annual weeds, though mostly continuous canopy.

Natural Polygon ID	45L	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-6
Surveyor	TR	Date	8/19/2007

Location	Scientific Name	Common Name
Canopy	*Quercus rubra*	Northern red oak
	Quercus macrocarpa	Bur Oak
	Quercus alba	White Oak
	Celtis occidentalis	Hackberry
	Salix nigra	Black Willow
Subcanopy	*Ostrya virginiana*	Ironwood
	Celtis occidentalis	Hackberry
	Fraxinus nigra	Black Ash
	Juniperus virginiana	Eastern Red Cedar
	Rhamnus cathartica	Common buckthorn
	Fraxinus pennsylvanica	Green Ash
Shrubs	*Rhamnus cathartica*	Common buckthorn
	Lonicera tatarica	Tartarian Honeysuckle
	Vitis riparia	Riverbank Grape
Ground	*Eupatorium rugosum*	White Snakeroot
	Solidago flexicaulis	Zigzag Goldenrod
	Lonicera tatarica	Tartarian Honeysuckle
	Carex blanda	Charming Sedge
	Carex rosea	Starry Sedge
	Carex pennsylvanica	Sun Loving Sedge

Notes: Mesic oak forest heavily disturbed by erosion, dumping and invasive species, particularly Common Buckthorn. Scattered open grown oaks present throughout. Lowland Hardwood species common in canopy.

Natural Polygon ID	45M	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-3
Surveyor	TR	Date	8/19/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Populus deltoides	Cottonwood
	Salix nigra	Black Willow
Subcanopy	*Fraxinus nigra*	Black Ash
	Acer saccharinum	Silver maple
	Ulmus americana	American Elm
	Populus deltoides	Cottonwood
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Amphicarpaea bracteata*	Hog Peanut
	Arcteum minor	Common Burdock
	Aster ontarionis	Ontario Aster
	Carex amphibola	Ambiguous Sedge
	Carex blanda	Charming Sedge
	Elymus virginicus	Virginia Wild Rye
	Eupatorium rugosum	White Snakeroot
	Hackelia virginiana	Virginia stickseed
	Impatiens capensis	Spotted Touch Me Not
	Laportea canadensis	Wood nettle
	Leersia oryzoides	Rice Cut Grass
	Leersia virginica	White Grass
	Leonurus cardiaca	Motherwort
	Parthenocissus inserta	Woodbine
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common buckthorn
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scutellaria lateriflora	Mad Dog Skullcap
	Stachys tenuifolia	Narrow-leaved hedge nettle
	Vitis riparia	Riverbank Grape

Notes: Mature Silver maple floodplain forest dominated by Silver maple with occassional Black Willow. Common buckthorn density is low. Areas of dense Wood Nettle are common, with bare soil common in other areas.

Natural Polygon ID	45N	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-4
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black ash
Subcanopy	*Fraxinus nigra*	Black ash
	Vitis riparia	Riverbank Grape
	Rhamnus cathartica	Common buckthorn
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Carex lacustris*	Lake Sedge
	Vernonia fasciculata	Bunched Ironwee
	Eupatorium maculatum	Spotted Joe-pye-weed
	Rudbeckia lacineata	Tall Coneflower
	Scirpus atrovirens	Dark Green Bulrush
	Leersia virginicus	White Grass
	Leersia oryzoides	Rice Cut Grass
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Scutellaria galericulata	Marsh Skullcap
	Syplocarpus foetidus	Skunk Cabbage

Notes: Black ash seep.

Natural Polygon ID	46A	MLCCS Code	61213
Community Description	Dry Prairie sand-gravel subtype	Quality Ranking	C
Field Check Level	3	Invasives	409-4, 410-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Juniperus virginiana var. virginiana*	Eastern red cedar
	Ulmus pumila	Siberian elm
Shrubs	*Amorpha canescens*	Leadplant
	Lonicera tatarica	Tartarian honeysuckle
Ground	*Bouteloua curtipendula*	Side-oats grama
	Asclepias viridiflora	Green milkweed
	Aster sericeus	Silky aster
	Calylophus serrulatus	Toothed evening primrose
	Erigeron strigosus	Daisy fleabane
	Liatris punctata	Dotted blazing star
	Panicum oligosanthes	Scribner's panic grass
	Schizachyrium scoparium var. scoparium	Little bluestem
	Solidago nemoralis	Gray goldenrod
	Verbena stricta	Hoary vervain

Notes: Dry prairie dominated by by Side-oats grama and Little bluestem. Infested with Leafy spruge and some Siberian elm.

Natural Polygon ID	46B	MLCCS Code	61213
Community Description	Dry Prairie sand-gravel subtype	Quality Ranking	B
Field Check Level	4	Invasives	
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus ellipsoidalis*	Northern pin oak
Subcanopy	*Juniperus virginiana var. virginiana*	Eastern red cedar
	Rhus glabra	Smooth sumac
Shrubs	*Amorpha canescens*	Leadplant
Ground	*Achillea millefolium*	Yarrow

Natural Polygon ID	46B	**MLCCS Code**	61213

Ambrosia coronopifolia	Ragweed
Andropogon gerardii	Big bluestem
Anemone patens var. multifida	Pasqueflower
Antennaria plantaginifolia	Plantain-leaved pussytoes
Asclepias verticillata	Whorled milkweed
Asclepias viridiflora	Green milkweed
Aster ericoides	Heath aster
Aster oblongifolius	Aromatic aster
Aster sericeus	Silky aster
Bouteloua curtipendula	Side-oats grama
Bouteloua hirsuta	Hairy grama
Calylophus serrulatus	Toothed evening primrose
Conyza canadensis var. canadensis	Horseweed
Dalea purpurea var. purpurea	Purple prairie clover
Erigeron sp.	Fleabane
Hedeoma hispida	Pennyroyal
Heterotheca villosa	Golden aster
Koeleria pyramidata	Junegrass
Kuhnia eupatorioides var. corymbulosa	False boneset
Liatris punctata	Dotted blazing star
Linum sp.	Yellow flax
Lithospermum incisum	Narrow-leaved puccoon
Muhlenbergia cuspidata	Plains muhly
Onosmodium molle	False gromwell
Panicum oligosanthes	Scribner's panic grass
Physalis heterophylla var. heterophylla	Clammy ground cherry
Poa pratensis	Kentucky bluegrass
Potentilla arguta	Tall cinquefoil
Schizachyrium scoparium var. scoparium	Little bluestem
Solidago nemoralis	Gray goldenrod
Sorghastrum nutans	Indian grass
Sporobolus heterolepis	Prairie dropseed
Stipa spartea	Porcupine grass
Verbena stricta	Hoary vervain
Viola palmata var. pedatifida	Bearded birdfoot violet

Notes:

Natural Polygon ID	46C	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6, 411-5, 410-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Tilia americana	Basswood
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
Ground	*Alliaria petiolata*	Garlic mustard
	Arctium minus	Common burdock
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf

Notes: Oak woodland dominated by Burk oaks with some Basswoods located on the mid-slope. Dense thickets of Common buckthorn and Garlic mustard throughout.

Natural Polygon ID	46D	MLCCS Code	32220
Community Description	Lowland hardwood	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 411-5, 410-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Celtis occidentalis*	Hackberry
	Fraxinus pennsylvanica	Green ash
	Quercus macrocarpa	Bur oak
	Tilia americana	Basswood
	Ulmus americana	American elm
Subcanopy	*Prunus virginiana*	Chokecherry
	Rhamnus cathartica	Common buckthorn
Shrub	*Lonicera tatarica*	Tartarian honeysuckle
Ground	*Alliaria petiolata*	Garlic mustard
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Eupatorium rugosum	White snakeroot

Notes: Lowland hardwood forest with dense thickets of Common buckthorn and Garlic mustard throughout.

Natural Polygon ID	46E	MLCCS Code	32220
Community Description	Lowland hardwood	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 412-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer negundo*	Box elder
	Fraxinus nigra	Black ash
	Fraxinus pennsylvanica	Green ash
	Juniperus virginiana var. virginiana	Eastern red cedar
	Populus deltoides var. occidentalis	Cottonwood
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
	Prunus virginiana	Chokecherry
	Rhamnus cathartica	Common buckthorn
Shrubs	*Cornus racemosa*	Gray dogwood
	Ribes missouriense	Missouri gooseberry
	Vitis riparia	Wild grape
Ground	*Asarum canadense*	Wild ginger
	Geum canadense	White avens
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Laportea canadensis	Wood nettle
	Phalaris arundinacea	Reed canary grass
	Rudbeckia laciniata var. laciniata	Tall coneflower
	Solidago flexicaulis	Zigzag goldenrod

Notes: Lowland hardwood forest dombinated by middle-aged Black ash, Green ash, and Basswood comprising a patchy canopy. Dense thickets of Common buckthorn especially near seeps along toe slope of valley. Wood nettle and Virginia waterleaf dominate the ground-cover.

Natural Polygon ID	46F	MLCCS Code	61213
Community Description	Dry prairie sand-gravel subtype	Quality Ranking	B
Field Check Level	3	Invasives	407-3, 409-3, 416-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
Subcanopy	*Ulmus pumila*	Siberian elm
Shrubs	*Amorpha canescens*	Leadplant
	Rosa arkansana	Prairie rose
Ground	*Achillea millefolium*	Yarrow
	Andropogon gerardii	Big bluestem
	Anemone patens	Pasqueflower
	Artemisia ludoviciana	White sage
	Asclepias viridiflora	Green milkweed
	Aster ericoides	Heath aster
	Aster oolentangiensis	Skyblue aster
	Astragalus crassicarpus	Ground plum
	Bouteloua curtipendula	Side-oats grama
	Bouteloua hirsuta	Hairy grama
	Calylophus serrulatus	Toothed evening primrose
	Campanula rotundifolia	Harebell
	Carex brevior	Short sedge
	Chrysopsis villosa	Hairy golden aster
	Coronilla varia	Crownvetch
	Dalea candida var. candida	White prairie clover
	Dalea purpurea	Purple prairie clover
	Delphinium carolinianum var. virescens	Prairie larkspur
	Elymus canadensis	Nodding wild rye
	Equisetum laevigatum	Smooth scouring rush
	Erigeron strigosus	Daisy fleabane
	Euphorbia esula	Leafy spurge
	Geum triflorum	Prairie smoke
	Koeleria pyramidata	Junegrass
	Lespedeza capitata	Round-headed bush clover
	Liatris punctata	Dotted blazing star
	Linum sulcatum	Grooved yellow flax
	Lithospermum canescens	Hoary puccoon
	Lithospermum incisum	Narrow-leaved puccoon

Natural Polygon ID	46F	**MLCCS Code**	61213
	Melilotus alba	White sweet clover	
	Monarda fistulosa	Wild bergamot	
	Muhlenbergia cuspidata	Plains muhly	
	Panicum oligosanthes	Scribner's panic grass	
	Penstemon gracilis	Slender beard tongue	
	Penstemon grandiflorus	Large-flowered beard tongue	
	Poa compressa	Canada bluegrass	
	Poa pratensis	Kentucky bluegrass	
	Potentilla arguta	Tall cinquefoil	
	Psoralea argophylla	Silver-leaved scurfpea	
	Rudbeckia hirta	Black-eyed Susan	
	Schizachyrium scoparium var. scoparium	Little bluestem	
	Senecio plattensis	Prairie ragwort	
	Sisyrhinchium campestre	Field blue-eyed grass	
	Sorghastrum nutans	Indian grass	
	Sporobolis heterolepis	Prairie dropseed	
	Stipa spartea	Porcupine grass	
	Tragopogon dubius	Yellow goat's beard	
	Verbascum thapsus	Common mullein	
	Verbena stricta	Hoary vervain	

Notes: Dry prairie sand-gravel subtype in good condition dominated by Little bluestem, Side-oats grama, and Indian grass. Excellent species diversity, except for dense patch of Crown vetch, which should be treated aggressively.

Natural Polygon ID	46G	MLCCS Code	61213
Community Description	Dry prairie sand-gravel subtype	Quality Ranking	AB
Field Check Level	3	Invasives	409-2, 416-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
Subcanopy	*Ulmus pumila*	Siberian elm
Shrubs	*Amorpha canescens*	Leadplant
	Rosa arkansana	Prairie rose
Ground	*Achillea millefolium*	Yarrow
	Andropogon gerardii	Big bluestem
	Anemone patens	Pasqueflower
	Artemisia ludoviciana	White sage
	Asclepias viridiflora	Green milkweed
	Aster ericoides	Heath aster
	Aster oolentangiensis	Skyblue aster
	Astragalus crassicarpus	Ground plum
	Bouteloua curtipendula	Side-oats grama
	Bouteloua hirsuta	Hairy grama
	Calylophus serrulatus	Toothed evening primrose
	Campanula rotundifolia	Harebell
	Carex brevior	Short sedge
	Chrysopsis villosa	Hairy golden aster
	Dalea candida var. candida	White prairie clover
	Dalea purpurea	Purple prairie clover
	Delphinium carolinianum var. virescens	Prairie larkspur
	Elymus canadensis	Nodding wild rye
	Equisetum laevigatum	Smooth scouring rush
	Erigeron strigosus	Daisy fleabane
	Euphorbia esula	Leafy spurge
	Geum triflorum	Prairie smoke
	Koeleria pyramidata	Junegrass
	Lespedeza capitata	Round-headed bush clover
	Liatris punctata	Dotted blazing star
	Linum sulcatum	Grooved yellow flax
	Lithospermum canescens	Hoary puccoon
	Lithospermum incisum	Narrow-leaved puccoon
	Melilotus alba	White sweet clover
	Monarda fistulosa	Wild bergamot

Natural Polygon ID	46G	MLCCS Code	61213
	Muhlenbergia cuspidata	Plains muhly	
	Panicum oligosanthes	Scribner's panic grass	
	Penstemon gracilis	Slender beard tongue	
	Penstemon grandiflorus	Large-flowered beard tongue	
	Poa compressa	Canada bluegrass	
	Poa pratensis	Kentucky bluegrass	
	Potentilla arguta	Tall cinquefoil	
	Psoralea argophylla	Silver-leaved scurfpea	
	Rudbeckia hirta	Black-eyed Susan	
	Schizachyrium scoparium var. scoparium	Little bluestem	
	Senecio plattensis	Prairie ragwort	
	Sisyrhinchium campestre	Field blue-eyed grass	
	Sorghastrum nutans	Indian grass	
	Sporobolis heterolepis	Prairie dropseed	
	Stipa spartea	Porcupine grass	
	Tragopogon dubius	Yellow goat's beard	
	Verbascum thapsus	Common mullein	
	Verbena stricta	Hoary vervain	

Notes: Dry prairie sand-gravel subtype in excellent condition. Dominated by Side-oats grama and Little bluestem. Big bluestem and Hairy grama also abundant. High species diversity with few exotics. Leafy spurge needs to be monitored and controlled.

Natural Polygon ID	46H	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
Subcanopy	*Rhamnus cathartica*	Common buckthorn

Notes: Extremely dense Common buckthorn.

Natural Polygon ID	46I	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	CD
Field Check Level	3	Invasives	408-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
	Prunus virginiana	Chokecherry
	Rhamnus cathartica	Common buckthorn
Shrubs	*Cornus alternifolia*	Pagoda dogwood
	Ribes cynosbati	Prickly gooseberry
Ground	*Asarum canadense*	Wild ginger
	Carex pensylvanica	Pennsylvania sedge
	Desmodium glutinosum	Pointed-leaved tick trefoil
	Hydrophyllum virginianum	Virginia waterleaf

Notes: Large ravine comprised of mesic oak forest dominated by Northern red oak, Bur oak, and Basswood. Dense Ironwood in the subcanopy and Common buckthorn throughout.

Natural Polygon ID	46K	MLCCS Code	32112
Community Description	Oak forest mesic subype	Quality Ranking	CD
Field Check Level	3	Invasives	408-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
	Prunus virginiana	Chokecherry
	Rhamnus cathartica	Common buckthorn
Shrubs	*Cornus alternifolia*	Pagoda dogwood
	Ribes cynosbati	Prickly gooseberry
Ground	*Asarum canadense*	Wild ginger
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Desmodium glutinosum	Pointed-leaved tick trefoil
	Hydrophyllum virginianum	Virginia waterleaf

Notes: Large ravine comprised of mesic oak forest dominated by Northern red oak, Bur oak, and Basswood. Dense Ironwood in the subcanopy and Common buckthorn throughout.

Natural Polygon ID	46J	MLCCS Code	32220
Community Description	Lowland hardwood	Quality Ranking	C
Field Check Level	3	Invasives	408-5, 412-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharum*	Sugar maple
	Fraxinus nigra	Black ash
	Fraxinus pennsylvanica	Green ash
	Tilia americana	Basswood
	Ulmus americana	American elm
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Ground	*Carex amphibola*	Ambiguous sedge
	Geum canadense	White avens
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Laportea canadensis	Wood nettle
	Oryzopsis racemosa	Black-fruited rice grass
	Phalaris arundinacea	Reed canary grass
	Sanguinaria canadensis	Bloodroot
	Urtica dioica ssp. gracilis	Stinging nettle
	Viola pubescens	Yellow violet

Notes: Even-aged lowland hardwood forest comprised of young trees 30-40 cm DBH. Common buckthorn and Wood nettle dominate the subcanopy and ground-cover respectively. Groundwater seeps present and composed primarily of Reed canary grass.

Natural Polygon ID	46L	MLCCS Code	32220
Community Description	Lowland hardwood	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 412-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black ash
	Fraxinus pennsylvanica	Green ash
	Juglans nigra	Black walnut
	Tilia americana	Basswood
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Ground	*Carex rosea*	Starry sedge
	Elymus virginicus	Virginia wild rye
	Equisetum hyemale var. affine	Tall scouring rush
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Phalaris arundinacea	Reed canary grass
	Rudbeckia laciniata var. laciniata	Tall coneflower

Notes: Low quality lowland hardwood forest with patchy canopy cover and heavy Common buckthorn concentrations. Seeps present and comprised primarily of Reed canary grass.

Natural Polygon ID	46M	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	CB
Field Check Level	3	Invasives	408-4, 410-2, 411-3
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Prunus serotina*	Black cherry
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
Subcanopy	*Juniperus virginiana var. virginiana*	Eastern red cedar
	Ostrya virginiana	Ironwood
	Rhamnus cathartica	Common buckthorn
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
	Zanthoxylum americanum	Prickly ash

Natural Polygon ID	46M	MLCCS Code	42120

Ground	*Agrimonia gryposepala*	Common agrimony
	Aster cordifolius	Heart-leaved aster
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Eupatorium rugosum	White snakeroot
	Fragaria virginiana	Common strawberry
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Oryzopsis racemosa	Black-fruited rice grass
	Osmorhiza claytonii	Clayton's sweet cicely
	Sanicula marilandica	Maryland black snakeroot
	Uvularia grandiflora	Large-flowered bellwort

Notes: Oak woodland dominated by short, open-grown Bur oak. Small patches of high quality mesic oak forest dominated by Northern red oak present in draws. Dry prairie species present on ridge tops.

Natural Polygon ID	46N	MLCCS Code	61213
Community Description	Dry Prairie sand-gravel subtype	Quality Ranking	C
Field Check Level	4	Invasives	413-3, 410-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Populus tremuloides*	Quaking aspen
Shrubs	*Amorpha canescens*	Leadplant
	Lonicera tatarica	Tartarian honeysuckle
	Zanthoxylum americanum	Prickly ash
Ground	*Agastache foeniculum*	Blue giant hyssop
	Andropogon gerardii	Big bluestem
	Bouteloua curtipendula	Side-oats grama
	Bromus inermis	Smooth brome
	Dalea purpurea var. purpurea	Purple prairie clover
	Erigeron strigosus	Daisy fleabane
	Helianthus pauciflorus	Stiff sunflower
	Lithospermum canescens	Hoary puccoon
	Monarda fistulosa	Wild bergamot
	Muhlenbergia cuspidata	Plains muhly
	Schizachyrium scoparium var. scoparium	Little bluestem

Natural Polygon ID	46N	**MLCCS Code**	61213
	Solidago canadensis	Canada goldenrod	
	Sorghastrum nutans	Indian grass	
	Sporobolus heterolepis	Prairie dropseed	
	Verbascum thapsus	Common mullein	

Notes: Small dry prairie dominated by Side-oats grama, Little bluestem and Indian grass. Smooth brome present, but low diversity due mainly to invasion of Quaking aspen and brush.

Natural Polygon ID	46O	**MLCCS Code**	32112
Community Description	Oak forest mesic subtype	**Quality Ranking**	C
Field Check Level	3	**Invasives**	408-3, 411-3
Surveyor	FH	**Date**	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Celtis occidentalis*	Hackberry
	Fraxinus pennsylvanica	Green ash
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Ostrya virginiana*	Ironwood
	Rhamnus cathartica	Common buckthorn
Ground	*Agrimonia gryposepala*	Common agrimony
	Alliaria petiolata	Garlic mustard
	Aster cordifolius	Heart-leaved aster
	Carex pensylvanica var. pensylvanica	Pennsylvania sedge
	Eupatorium rugosum	White snakeroot
	Fragaria virginiana	Common strawberry
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Oryzopsis racemosa	Black-fruited rice grass
	Osmorhiza claytonii	Clayton's sweet cicely
	Sanicula marilandica	Maryland black snakeroot
	Uvularia grandiflora	Large-flowered bellwort

Notes: Mesic oak forest found in the ravines and lower slopes to the east of Nine-mile creek. Dominated by Northern red oak and Basswood. Ironwood is the sole understory species.

Natural Polygon ID	46P	MLCCS Code	32112
Community Description	Oak forest mesic subtype	Quality Ranking	B
Field Check Level	3	Invasives	408-4, 410-3, 411-4
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Celtis occidentalis*	Hackberry
	Fraxinus pennsylvanica	Green ash
	Quercus macrocarpa	Bur oak
	Quercus rubra	Northern red oak
	Tilia americana	Basswood
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Shrubs	*Lonicera tatarica*	Tartarian honeysuckle
Ground	*Alliaria petiolata*	Garlic mustard
	Asarum canadense	Wild ginger
	Adiantum pedatum	Maidenhair fern
	Athyrium filix-femina var. angustum	Lady fern
	Carex pedunculata	Long-stalked sedge
	Solidago flexicaulis	Zigzag goldenrod
	Elymus hystrix	Bottlebrush grass
	Hydrophyllum virginianum var. virginianum	Virginia waterleaf
	Glechoma hederacea	Creeping Charlie
	Aquilegia canadensis	Columbine

Notes: Mesic oak forest dominated by Northern red oak and Basswood on north facing slope. Moderate Common buckthorn and Garlic mustard invasion.

Natural Polygon ID	46Q	MLCCS Code	61213
Community Description	Dry Prairie sand-gravel subtype	Quality Ranking	
Field Check Level	4	Invasives	
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy		
	Access Denied	
Subcanopy		
Shrubs		
Ground		
Notes:		

Natural Polygon ID	46R	MLCCS Code	42120
Community Description	Oak woodland-brushland	Quality Ranking	D
Field Check Level	3	Invasives	408-5
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Quercus macrocarpa*	Bur oak
	Juniperus virginiana var. virginiana	Eastern red cedar
Subcanopy	*Prunus virginiana*	Chokecherry
	Rhamnus cathartica	Common buckthorn
Shrubs	*Cornus racemosa*	Gray dogwood
	Rubus idaeus var. strigosus	Red raspberry
Ground	*Carex pensylvanica var. pensylvanica*	Pennsylvania sedge

Notes: Oak woodland dominated by open-grown Bur oaks and Eastern red cedars. Dense Common buckthorn thickets and low species diversity with Pennsylvania sedge comprising the entire ground-cover.

Natural Polygon ID	46S	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	B
Field Check Level	3	Invasives	408-2
Surveyor	FH	Date	8/2/2006

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Populus deltoides var. occidentalis	Cottonwood
Subcanopy	*Rhamnus cathartica*	Common buckthorn
Ground	*Laportea canadensis*	Wood nettle

Notes: Mature Silver maple floodplain forest dominated by Silver maple with occassional Cottonwoods. Common buckthorn density is low, but dense Wood nettle covers the ground.

Natural Polygon ID	46V	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 412-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
Subcanopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green Ash
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Carex sp.*	Sedge
	Circium vugare	Bull Thistle
	Impatiens capensis	Spotted Touch-me-not
	Laportea canadensis	Wood nettle
	Leersia oryzoides	Rice Cut Grass
	Leersia virginica	White Grass
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common buckthorn
	Smilax tamnoides	Greenbriar
	Urtica dioica	Stinging Nettle

Notes: Mostly monotype even-aged Cottonwood stand below 35W Freeway berm with ditch running to Stormwater Pond at River edge. Beaver Activity present.

Natural Polygon ID	46W	MLCCS Code	61720
Community Description	Mixed Emergent Marsh - Intermittently Exposed	Quality Ranking	B
Field Check Level	3	Invasives	412-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Carex lacustris*	Lake sedge
	Carex sp.	Sedge
	Iris versicolor	Northern Blue Flag Iris
	Laportea canadensis	Wood Nettle
	Lemna minor	Lesser Duckweed
	Phalaris arundinacea	Reed Canary Grass
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scuttellaria galericulata	Mad Dog Skullcap
	Sparganium eurycarpum	Giant Bur Reed
	Sparganium eurycarpum	Giant Bur Reed

Notes: Wet meadow, intermittently exposed. Dominated by patches of Bur Reed and Arrowhead. Evidence of open water during early part of growing season. Leersia species appear to be annual on mudflat.

Natural Polygon ID	46X	MLCCS Code	32211
Community Description	Floodplain forest	Quality Ranking	B
Field Check Level	3	Invasives	408-2, 412-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Populus deltoides*	Cottonwood
	Acer saccharinum	Silver maple
	Fraxinus pennsylvanica	Green Ash
Subcanopy	*Acer saccharinum*	Silver maple
	Populus deltoides	Cottonwood
	Fraxinus nigra	Black Ash
	Fraxinus pennsylvanica	Green Ash
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Carex sp.*	Sedge
	Circium vugare	Bull Thistle
	Impatiens capensis	Spotted Touch-me-not
	Laportea canadensis	Wood nettle
	Leersia oryzoides	Rice Cut Grass

Natural Polygon ID	46X	**MLCCS Code**	32211
	Leersia virginica	White Grass	
	Pilea pumila	Dwarf Clearweed	
	Rhamnus cathartica	Common buckthorn	
	Smilax tamnoides	Greenbriar	
	Urtica dioica	Stinging Nettle	
	Carex hystericina	Porcupine Sedge	
	Vitis riparia	Riverbank Grape	
	Sium suave	Wild Cucumber	
	Physostegia virginica	Obedient Plant	
	Stachys tenuifolia	Narrow-leaved Hedge Nettle	
	Scuttelaria laterifolia	Mad Dog Skullcap	
	Vernonia fasciculata	Bunched Ironweed	
	Iris versicolor	Northern Blue Flag Iris	
	Viola sp.	Violet	
	Elymus virginicus	Virginia Wild Rye	
	Lysimachia ciliata	Fringed Loosestrife	
	Circium arvensis	Canada Thistle	
	Aster ontarionis	Ontario Aster	

Notes: Good quality Silver Maple Floodplain forest away from flows and weed sources of river. Scattered Silver Maple over thick ground layer vegetation dominated by sedge species. Irregular polygon shape reflects position of this forest on sandbars between Minnesota River and river backwater areas. Surrounded by emergent wet openings.

Natural Polygon ID	46Y	**MLCCS Code**	61620
Community Description	Mixed Emergent Marsh	**Quality Ranking**	B
Field Check Level	3	**Invasives**	
Surveyor	TR	**Date**	8/9/2007

Location	**Scientific Name**	**Common Name**
Canopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green Ash
Ground	*Scirpus fluviatalis*	River Bulrush
	Impatiens capensis	Spotted touch-me-not
	Pilea pumila	Dwarf Clearweed
	Sagittaria latifolia	Broad Leaved Arrowhead
	Mentha arvensis	Common Mint

Notes: Flooded scattered trees in Emergent Marsh setting. Dominated by River Bulrush and Arrowhead.

Natural Polygon ID	46Z	MLCCS Code	61640
Community Description	Wet Meadow - Semipermanently Flooded	Quality Ranking	B/C
Field Check Level	3	Invasives	406-3,412-3, 408-3 (Glossy Buckthorn
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus pennsylvanica*	Green Ash
Shrub	*Salix discolor*	Pussy Willow
	Salix sp	A Willow Species
	Amorpha fruticosa	False Indigo
	Cornus serecia	Red Osier Dogwood
	Rhamnus frangula	Glossy Buckthorn
Ground	*Acorus calamus*	Sweet Flag
	Asclepias incarnata	Marsh Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Caltha palustris	Marsh Marigold
	Campanula aparinoides	Marsh Bellflower
	Carex hystericina	Porcupine Sedge
	Carex lacustris	Lake sedge
	Carex stipata	Awl-fruited Sedge
	Carex stricta	Tussock Sedge
	Convovulus arvensis	Field Bindweed
	Cypreipidium calceolus	Large Yellow Lady's Slipper
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Iris versicolor	Northern Blue Flag Iris
	Lycopus americanus	Cut-leaved Bugleweed
	Lycopus virginicus	Virginia Bugleweed
	Lysimachia thrisiflora	Swamp Candles
	Mentha arvensis	Common Mint
	Parthenocissus inserta	Woodbine
	Phalaris arundinacea	Reed canary grass
	Phragmites australis	Giant Reed Grass
	Rumex crispus	Curly Dock
	Rumex orbiculatus	Great Water Dock
	Sagittaria latifolia	Broad Leaved Arrowhead

Natural Polygon ID	46Z	MLCCS Code	61640
	Scirpus acutus	Soft Stem Bulrush	
	Scirpus fluviatalis	River Bulrush	
	Scuttellaria galericulata	Mad Dog Skullcap	
	Solanum dulcamara	Bittersweet Nightshade	
	Solidago gigantea	Giant Goldenrod	
	Sparganium eurycarpum	Giant Bur Reed	
	Theliptris palustris	Marsh Fern	
	Toxicodendron radicans	Poison Ivy	
	Urtica dioica	Stinging Nettle	
	Vernonia fasciculata	Bunched Ironweed	

Notes: Wet meadow, semipermanently flooded with high species diversity. Phragmites invasion occuring, and appears to be spreading quickly. Glossy buckthorn common, especially among other shrubs. Reed CAnary Grass and Hybrid Cattails common. Sedges dominate ground layer with Shrub False Indigo common throughout. Basin fed by groundwater seeps and overland flow. Yellow Lady's Slipper as well as addional unidentified orchid species (no flower) present. Ground layer dominated by Lake Sedge

Natural Polygon ID	46AA	MLCCS Code	32311
Community Description	Black ash swamp seepage subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-4, 411-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Fraxinus nigra*	Black ash
	Acer negundo	Boxelder
Subcanopy	*Fraxinus nigra*	Black ash
	Ulmus americana	American Elm
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Aster ontarionis*	Ontario aster
	Alliaria petiolaris	Garlic Mustard
	Caltha palustris	Marsh Marigold
	Parthenocissus quinquefolia	Woodbine
	Calamagrostis canadensis	Bluejoint
	Leersia virginicus	White Grass
	Leersia oryzoides	Rice Cut Grass
	Impatiens capensis	Spotted touch-me-not
	Laportea canadensis	Wood nettle
	Equisetum fluviatale	Water Horsetail
	Syplocarpus foetidus	Skunk Cabbage

Notes: Black ash seep with heavy Wood Nettle thorughout. Skunk Cabbage common under Wood Nettle. Located at base of Oak forest above open wet meadow. Black Ash Canopy continuous throughout.

Natural Polygon ID	46BB	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	B
Field Check Level	4	Invasives	
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Sagittaria latifolia*	Broad Leaved Arrowhead
	Scirpus acutus	Soft Stem Bulrush
	Scirpus fluviatalis	River Bulrush
	Urtica dioica	Stinging Nettle
	Polygonum hydropiper	Marsh Waterpepper
	Polygonum amphibium	Water Smartweed

Notes: Emergent Marsh located in at edge of Water Lily Open Water Marsh. Dominated by River Bulrush.

Natural Polygon ID	46CC	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-3
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Fraxinus pennsylvanica	Green Ash
Subcanopy	*Acer negundo*	Boxelder
	Acer saccharinum	Silver maple
	Fraxinus pennsylvanica	Green Ash
	Populus deltoides	Cottonwood
Shrub	*Rhamnus cathartica*	Common buckthorn
	Cornus racemosa	Gray Dogwood
	Vitis riparia	Riverbank Grape
Ground	*Ambrosia trifida*	Giant Ragweed
	Elymus virginicus	Virginia Wild Rye
	Laportea canadensis	Wood nettle
	Leersia virginica	White Grass
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common buckthorn
	Amphicarpaea bracteata	Hog Peanut

Notes: Widely scattered mature silver maple dominated canopy with mixed understory dominated by Silver Maple. Ground layer nearly continuous Wood Nettle. American Elm common in ground layer, uncommon otherwise.

Natural Polygon ID	47A	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Celtis occidentalis	Hackberry
	Acer negundo	Boxelder
	Populus deltoides	Cottonwood
Subcanopy	*Acer negundo*	Boxelder
	Acer saccharinum	Silver maple
	Ulmus americana	American Elm
	Tilia americana	Basswood
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Arteum minus*	Burdock
	Aster ontarionis	Ontario Aster
	Elymus virginicus	Virginia Wild Rye
	Eupatorium rugosum	White Snakeroot
	Hackelia	
	Laportea canadensis	Wood nettle
	Leersia virginica	White Grass
	Pilea pumila	Dwarf Clearweed
	Plantago major	Common Plantain
	Rhamnus cathartica	Common buckthorn
	Rudbeckia lacineata	Tall Coneflower
	Sicyos angulatus	Bur Cucumber
	Stachys palustris	Woundwort
	Urtica dioica	Stinging Nettle
	Carex retrorsa	Retrorse Sedge

Notes: Floodplain forest with equal mix of Cottonwoods and Silver Maple. Cottonwood dominant in canopy. Variable. Areas of Buckthorn invaseion heavy, though mostly clear of invasives.

Natural Polygon ID	47C	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	C
Field Check Level	3	Invasives	406-3,411-2
Surveyor	TR	Date	8/20/2007

Location	Scientific Name	Common Name
Canopy	*Salix nigra*	Black Willow
	Acer saccharinum	Silver Maple
	Fraxinus nigra	Black Ash
Shrub	*Amorpha fruticosa*	False Indigo
	Cornus serecia	Red Osier Dogwood
Ground	*Acorus calamus*	Sweet Flag
	Typha x glauca	Hybrid Cattail
	Helenium autumnale	Sneezeweed
	Asclepias incarnata	Marsh Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh Bellflower
	Carex hystericina	Porcupine Sedge
	Carex lacustris	Lake sedge
	Carex stipata	Awl-fruited Sedge
	Carex stricta	Tussock Sedge
	Chelone glabra	White Turtlehead
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum var. perfoliatum	Common boneset
	Galium triflorum	Sweet-scented Bedstraw
	Impatiens capensis	Spotted touch-me-not
	Lycopus americanus	Cut-leaved Bugleweed
	Lycopus uniflorus	Northern Bugleweed
	Lysimachia thrisiflora	Swamp Candles
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Phragmites australis	Giant Reed Grass
	Pilea sp.	Clearweed
	Rumex crispus	Curly Dock
	Rumex orbiculatus	Great Water Dock
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus acutus	Soft Stem Bulrush

	Scirpus fluviatalis	River Bulrush
	Scuttellaria galericulata	Mad Dog Skullcap
	Sparganium eurycarpum	Giant Bur Reed
	Thelyptris palustris	Marsh Fern
	Urtica dioica	Stinging Nettle
	Vernonia fasciculata	Bunched Ironweed
	Echinocystis lobata	Wild Cucumber

Notes: Seasonally Flooded Wet meadow. Upslope of stormwater basin dominated by cattail. Wet meadow has invasive Reed Canary Grass, Phragmites and Cattails throughout, but high diversity composition overall.

Natural Polygon ID	47D	**MLCCS Code**	61540
Community Description	Wet Meadow - Seasonally Flooded	**Quality Ranking**	D
Field Check Level	3	**Invasives**	406-3,412-3, 417-2
Surveyor	TR	**Date**	8/19/2007

Location	Scientific Name	Common Name
Shrub	*Cornus serecia*	Red Osier Dogwood
	Salix exigua	Sandbar Willow
Ground	*Acorus calamus*	Sweet Flag
	Asclepias incarnata	Marsh Milkweed
	Aster ontarionis	Ontario Aster
	Calamagrostis canadensis	Canada Bluejoint
	Carex hystericina	Porcupine Sedge
	Carex lacustris	Lake sedge
	Carex stricta	Tussock Sedge
	Cicuta bulbifera	Bulb-bearing Water Hemlock
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum	Common boneset
	Impatiens capensis	Spotted touch-me-not
	Iris versicolor	Northern Blue Flag Iris
	Phalaris arundinacea	Reed canary grass
	Phragmites australis	Giant Reed Grass
	Rumex crispus	Curly Dock
	Rumex orbiculatus	Great Water Dock
	Sagittaria latifolia	Broad Leaved Arrowhead

Natural Polygon ID	47D	MLCCS Code	61540
	Scirpus atrovirens	Dark Green Bulrush	
	Scirpus fluviatalis	River Bulrush	
	Sicyos angulatus	Bur Cucumber	
	Sparganium eurycarpum	Giant Bur Reed	
	Theliptris palustris	Marsh Fern	
	Urtica dioica	Stinging Nettle	

Notes: Wet meadow with stream feature at edge. Heavy invasion by Sandbar Willow and Hybrid Cattail. Native species dominant, especially Sweetflag.

Natural Polygon ID	48A	MLCCS Code	32211
Community Description	Floodplain forest Silver maple subtype	Quality Ranking	B
Field Check Level	3	Invasives	408-2, 415-2
Surveyor	TR	Date	8/1/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Populus deltoides	Cottonwood
Subcanopy	*Fraxinus pennsylvanica*	Green Ash
	Acer saccharinum	Silver maple
	Acer negundo	Boxelder
	Populus deltoides	Cottonwood
Shrub	*Rhamnus cathartica*	Common buckthorn
Ground	*Aster ontarionis*	Ontario Aster
	Elymus virginicus	Virginia Wild Rye
	Laportea canadensis	Wood nettle
	Leersia virginica	White Grass
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common buckthorn
	Rubus sp.	Raspberry species
	Sicyos angulatus	Bur Cucumber
	Urtica dioica	Stinging Nettle

Notes: Mature Silver maple floodplain forest dominated by Silver maple and large Cottonwood. Common buckthorn density is low. Wood Nettle carpets ground layer.

Natural Polygon ID	48B	MLCCS Code	61720
Community Description	Mixed Emergent Marsh - Intermittently Exposed	Quality Ranking	B
Field Check Level	4	Invasives	
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Acorus calamus*	Sweet Flag
	Campanula aparinoides	Marsh Bellflower
	Carex lacustris	Lake sedge
	Carex stricta	Tussock Sedge
	Lycopus americanus	Cut-leaved Bugleweed
	Lysimachia thrisiflora	Swamp Candles
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus acutus	Soft Stem Bulrush
	Scirpus fluviatalis	River Bulrush
	Scuttellaria galericulata	Mad Dog Skullcap
	Sparganium eurycarpum	Giant Bur Reed

Notes: Wet meadow, intermittently exposed. Dominated by River Bulrush. Surrounded by larger Wet Meadow. Very wet situation limits encroachment by nearby Reed Canary Grass.

Natural Polygon ID	48C	MLCCS Code	61640
Community Description	Wet Meadow - Semipermanently Flooded	Quality Ranking	B
Field Check Level	4	Invasives	406-3,412-3, 412-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Ground	*Acorus calamus*	Sweet Flag
	Amorpha fruticosa	False Indigo
	Apocynum androsaemifolium	Spreading Dogbane
	Asclepias incarnata	Marsh Milkweed
	Calamagrostis canadensis	Canada Bluejoint
	Campanula aparinoides	Marsh Bellflower
	Carex hystericina	Porcupine Sedge
	Carex lacustris	Lake sedge
	Carex stipata	Awl-fruited Sedge
	Carex stricta	Tussock Sedge
	Circium canadensis	Canada Thistle
	Eupatorium maculatum	Spotted Joe-Pye-Weed
	Eupatorium perfoliatum	Common boneset
	Galium triflorum	Sweet-scented Bedstraw
	Impatiens capensis	Spotted touch-me-not
	Lycopus americanus	Cut-leaved Bugleweed
	Lycopus uniflorus	Northern Bugleweed
	Lysimachia thrisiflora	Swamp Candles
	Mentha arvensis	Common Mint
	Phalaris arundinacea	Reed canary grass
	Phragmites australis	Giant Reed Grass
	Rumex crispus	Curly Dock
	Rumex orbiculatus	Great Water Dock
	Sagittaria latifolia	Broad Leaved Arrowhead
	Scirpus acutus	Soft Stem Bulrush
	Scirpus fluviatalis	River Bulrush
	Scuttellaria galericulata	Mad Dog Skullcap
	Sparganium eurycarpum	Giant Bur Reed
	Theliptris palustris	Marsh Fern
	Urtica dioica	Stinging Nettle
	Vernonia fasciculata	Bunched Ironweed

Notes: Wet meadow, semipermanently flooded with high species diversity. Phragmites invasion occuring, but limited to spreading patches. Sedges dominate ground layer with Shrub False Indigo common throughout. Basin fed by combination backwaters from MInnesota River, upslope development areas and seeps at base of bluffs. Built elevation control structures keep this basin elevated above River levels.

Natural Polygon ID	49A	MLCCS Code	32210
Community Description	Floodplain forest	Quality Ranking	C
Field Check Level	3	Invasives	408-2
Surveyor	TR	Date	8/9/2007

Location	Scientific Name	Common Name
Canopy	*Acer saccharinum*	Silver maple
	Populus deltoides	Cottonwood
Subcanopy	*Acer negundo*	Boxelder
	Acer saccharinum	Silver maple
	Fraxinus pennsylvanica	Green Ash
	Populus deltoides	Cottonwood
	Vitis riparia	Riverbank Grape
Shrub	*Rhamnus cathartica*	Common buckthorn
	Fraxinus pennsylvanica	Green Ash
Ground	*Aster ontarionis*	Ontario Aster
	Elymus virginicus	Virginia Wild Rye
	Laportea canadensis	Wood nettle
	Leersia virginica	White Grass
	Pilea pumila	Dwarf Clearweed
	Rhamnus cathartica	Common buckthorn
	Rubus sp.	Raspberry species
	Sicyos angulatus	Bur Cucumber
	Urtica dioica	Stinging Nettle
	Parthenocissus inserta	Woodbine
	Solidago flexicaulis	Zigzag Goldenrod
	Solidago gigantea	Giant Goldenrod
	Stachys palustris	Woundwort
	Physostegia virginiana	Obedient Plant
	Vitis riparia	Riverbank Grape
	Lycopus americanus	Cut-leaved Bugleweed
	Ambrosia trifida	Giant Ragweed
	Fraxinus pennsylvanica	Green Ash
	Ambrosia artemesifolia	Common Ragweed
	Rudbeckia lacineata	Tall Coneflower

Notes: Floodplain forest with equal mix of Cottonwoods and Silver Maple. Cottonwood dominant in canopy. Variable. Trail and some clear leave openings for annual weeds, though mostly continuous canopy.

APPENDIX C

MLCCS GLOSSARY

Aquatic Bed - Aquatic Bed includes wetlands and deepwater habitats dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years. Water regimes include irregularly exposed, regularly flooded, permanently flooded, intermittently exposed, semipermanently flooded, and seasonally flooded. Aquatic Beds represent a diverse group of plant communities that requires surface water for optimum growth and reproduction. They are best developed in relatively permanent water or under conditions of repeated flooding. The plants are either attached to the substrate or float freely in the water above the bottom or on the surface. (Cowardin, et. al.)

Artificial cover – Non-vegetative cover either made or modified by human activity and prohibiting or restricting plant growth and water penetration. (Road and roof surfaces, paved and stone surface parking areas, sidewalks and driveways are included.) [NRI-92]

Artificial surfaces and associated areas - Areas which contain artificial cover which is the result of human activities such as construction (e.g. buildings, pavement), extraction sites (e.g. open mines, quarries, pits) and waste disposal sites. This class is determined by the presence of manmade impervious surface.

Artificially Flooded - The amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams. The vegetation growing on these areas cannot be considered a reliable indicator of water regime. Examples of artificially flooded wetlands are some agricultural lands managed under a rice-soybean rotation, and wildlife management areas where forests, crops, or pioneer plants may be flooded or dewatered to attract wetland wildlife. Neither wetlands within or resulting from leakage from man-made impoundments, nor irrigated pasture lands supplied by diversion ditches or artesian wells, are included under this modifier.

Close grown cropland - Crops that are generally drill-seeded or broadcast, such as wheat, oats,and barley. (NRI).

Conifer (tree) - a needle-leaved tree with cones (i.e., a gymnosperm). (DNRNH) Note: The MLCCS changed NVCS's Evergreen classification to coniferous, thus moving tamarack and tamarack forests from the NVCS deciduous classification to a coniferous classification.

Cover - the proportion of the ground covered by projecting the plant canopy or artificial surfaces vertically downward onto the ground. This would be the proportion of the ground surface shaded by plants if the sun were directly overhead. (DNRNH)

Cowardin system - A classification system of wetlands and deep water habitats of the United States, officially adopted by the U.S. Fish and Wildlife Service (FWS) used to develop wetland data bases. The system was developed by Lewis M. Cowardin of the U.S. Fish and Wildlife Service and others. The five major systems are recognized in the NRI: Estuarine, Lacustrine, Marine, Palustrine, and Riverine. (USFWS)

Cropland - Areas used for the production of adapted crops for harvest. Two categories of cropland are recognized: row cropland, and close grown cropland. (NRI)

Cultivated - Describes vegetation planted by humans and/or treated with annual management; usually dominated by plants not indigenous to the area (NVCS). This vegetation is usually planted with the intent on harvest, often on an annual basis. Regular modification of cover is expected.

Cultural Cover - Areas where the natural vegetation has been removed or modified and replaced by different types of cover resulting from anthropic activities. This cover is artificial and requires human activities to be maintained over the long term. In between the human activities, the surface can be temporarily without vegetative cover. Its seasonal phonological appearance can be regularly modified by humans (e.g. irrigation). All vegetation that is planted, maintained or cultivated with the intent to harvest is included in this class (e.g. wheat fields, orchards. Restorations or re-planting of natural communities are not considered in this category because although planted, they are intended to mimic natural cover. This class is determined by vegetation, cover, time factor, soil condition and artificiality of cover. (Di Gregorio andJansen).

Deciduous - Describes a woody plant that seasonally loses all of its leaves and becomes temporarily bare-stemmed. (NVCS). Note: The MLCCS changed NVCS's Evergreen classification to coniferous, thus moving tamarack and tamarack forests from the NVCS deciduous classification to a coniferous classification.

Diked - Created or modified by a man-made barrier or dike designed to obstruct the inflow of water. (Cowardin, et al.)

DNRNH - see Natural Heritage

Dominant - A plant species that shapes the character of a community by virtue of its great size, dense shade, allelochemic properties, or effects on soils. Dominant species generally influence the presence, growth, and distribution of other plant species in the community. (DNRNH)

Dwarf-shrub - Low-growing shrub life form usually under 0.5 m or 1.5 feet tall (never exceeding 1 meter or 3 feet tall) at maturity. (NVCS)

Dwarf-shrubland - Vegetation dominated by low-growing shrubs, usually under 0.5 m or 1.5 feet tall, with individuals or clumps overlapping to not touching (generally forming more than 25% cover, trees and tall shrubs generally less than 25% cover); dwarf-shrub cover may be less than 25% where it exceeds tree, shrub, herb, and nonvascular cover, respectively. (NVCS)

Emergent - A plant capable of surviving indefinitely with its root system and lower stem submerged and its aerial shoots above water (e.g., cattails). (DNRNH)

Excavated - Lies within a basin or channel excavated by humans. (Cowardin, et al.)

Fallow - Cropland which has been left idle, either tilled or untilled, during the whole or greater portion of the growing season. (SCSA)

Farmed - The soil surface has been mechanically or physically altered for production of crops, but hydrophytes will become reestablished if farming is discontinued. (Cowardin, et al.)

Floating plant - A non-anchored plant that floats freely in the water or on the surface; e.g., water hyacinth (Eichhornia crassipes) or common duckweed (Lemna minor). (Cowardin et. al.)

Floodplain - A flat terrace along a stream or river, created by erosion and deposition of sediment during flood cycles. Signs of active flooding include debris caught in trees growing on the floodplain or ice scars at the bases of the trees. (DNRNH)

Forb - A broad-leaved herbaceous plant. (NVCS)

Forest - Trees with their crowns overlapping (generally forming 60 - 100% cover). Forests are defined primarily by the dominant species present, not by the current height of the cover. For example, if the area is composed by young elms and ashes that are only 15 feet tall, it would be classified as a forest or woodland depending on the density of the tree species. If the area is composed of willows and dogwoods also 15 feet tall, it would be classified as shrubland. (NVCS)

Gleyed soil - A poorly drained soil with gray coloring or mottling caused by the reduction of iron and other elements that occurs under poor drainage conditions. (DNRNH)

Graminoid - A plant with linear "grass-like" leaves that typically branch vertically from the stem. Graminoids are members of the Gramineae, Cyperaceae, Juncaceae, Iridaceae, Typhaceae, Sparginiaceae, and other families. (DNRNH)

Grassland - Vegetation dominated by perennial graminoid plants. (NVCS)

Hayfield - Land managed for the production of forage crops that are machine harvested. These crops may be grasses, legumes, or a combination. (NRI)

Herb - A vascular plant without significant woody tissue above or at the ground; an annual, biennial, or perennial plant lacking significant thickening by secondary woody growth, with perennating buds borne at or below the ground surface (hemicryophytes, geophytes, helophytes, and therophytes). (NVCS)

Herbaceous - A plant without a persistent above-ground woody stem (e.g. graminoids, forbs, and ferns). (DNRNH)
Herbaceous Vegetation - Vegetation in which herbs (graminoids, forbs, and ferns) dominate (generally forming at least 25% cover, trees, shrubs, and dwarf-shrubs generally with less than 25% cover). Herb cover may be less than 25% where it exceeds tree, shrub, dwarf-shrub, and nonvascular cover, respectively. (NVCS)

Hydric soil - Soil that is wet long enough to periodically produce anaerobic conditions, thereby influencing the growth of plants. (Cowardin, et al.)

Hydrophyte - A plant able to grow in water or on wet soils that are periodically saturated and deficient in oxygen. (DNRNH)

Impervious cover - The sum of roof, pavement and other impermeable surfaces.

Impounded - Created or modified by a barrier or dam which purposefully or unintentionally obstructs the outflow of water. Both man-made dams and beaver dams are included. (Cowardin,et al.)

Intermittently Exposed - Surface water is present throughout the year except in years of extreme drought. (Cowardin, et al)

Intermittently Flooded - The substrate is usually exposed, but surface water is present for variable periods without detectable seasonal periodicity. Weeks, months, or even years may intervene between periods of inundation. The dominant plant communities under this regime may change as soil moisture conditions change. Some areas exhibiting this regime do not fall within our definition of wetland because they do not have hydric soils or support hydrophytes. (Cowardin, et al.)

Lake (Lacustrine) - Wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) trees, shrubs, persistent emergents, emergent mosses or lichens are less than 30% of the coverage; and (3) total area exceeds 8 ha (20 acres). Similar wetland and deepwater habitats totaling less than 8 ha are also included in the Lacustrine System if an active wave-formed or bedrock shoreline feature makes up all or part of the boundary, or if the water depth in the deepest part of the basin exceeds 2 m (6.6 feet) at low water. (Cowardin, et al.)

Lichen - An organism generally recognized as a single plant that consists of a fungus and an alga or cyanobacterium living in symbiotic association. (NVCS)

Long grasses - Mixed grass species such as those typically found along roadsides (Bromegrass, Fescue, ryegrass, vetch, alfalfa, Bluestem, Grama, oats, wheat, etc). Species may be native and/or non-native. Forbs may also be present. Mowing may occur, though infrequently.

Mesic habitat - A habitat with average soil moisture, where soil moisture is not limiting to plant growth during the growing season, and soils are not saturated except following rain or spring snowmelt. (DNRNH)

Minerotrophic - A wetland receiving nutrients from groundwater as well as from rainwater, or a wetland with peat and surface water nutrient content considerably higher than that of rainwater. (DNRNH)

Mottled soil - A soil with spots or blotches of a color different from the base color of the soil. Mottling results from cycles of anaerobic and aerobic conditions caused by cycles of soil saturation and drying. (DNRNH)

Native Species - Species that grew in Minnesota prior to European settlement. (Reed canary grass (*Phalaris arundinacea*) is not considered native even though it probably grew in Minnesota before settlement because its genetics have likely been altered by the import of exotic strains, and it has become an aggressive invader of wetlands.)

Natural Heritage (DNRNH) - Minnesota Department of Natural Resources Natural Heritage Program. The Natural Heritage program published *Minnesota's Native Vegetation: A Key to Native Communities*. This publication has been used throughout the MLCCS to describe natural vegetation.

Natural and Semi-Natural Communities - Natural communities are defined as areas where the vegetative cover is in balance with the biotic and abiotic forces of its biotope. The natural communities in the MLCCS have been described by the Natural Heritage Program of the Minnesota Department of Natural Resources or the National Vegetation Classification System. Semi-natural vegetation is defined as vegetation not planted by humans but influenced by human actions, either deliberate or inadvertent. Semi-natural vegetation may result from livestock grazing, logging, or the abandonment of previously cultivated areas where vegetation is regenerating. Thus, semi-natural vegetation is a result of human influences but is not artificial and does not require human activities to be maintained over the long term. Natural and Semi-Natural Communities include planted areas that successfully mimic the dominant features of natural communities. This class is determined by vegetation, cover, time factor, soil condition and natural cover. (NVCS, DNRNH, Di Gregorio and Jansen)

Non-heritage type - Plant Community types not defined by Minnesota's Native Vegetation: *A Key to Natural Communities* , published by the DNR Natural Heritage Program, 1993.

Non-Native Species - Species brought to Minnesota intentionally or accidentally by humans since European settlement. (Reed canary grass (*Phalaris arundinacea*) is considered non-native even though it probably grew in Minnesota before settlement because its genetics have likely been altered by the import of exotic strains, and it has become an aggressive invader of wetlands.)

Nonvascular vegetation - Nonvascular cover (bryophytes, non-crustose lichens, and algae) dominant (generally forming at least 25% cover). Nonvascular cover may be less than 25% where it exceeds tree, shrub, dwarf-shrub, and herb cover, respectively. (NVCS)

Nonvascular plant - A plant without specialized water or fluid conductive tissue (xylem and phloem); includes bryophytes, non-crustose lichens, and algae. (NVCS)

NRI - National Resources Inventory. The NRI is conducted by the USDA Natural Resources Conservation Service (NRCS)

NWI - National Wetlands Inventory

NVCS - US National Vegetation Classification System documents of the *International*

Classification of Ecological Communities: Terrestrial Vegetation of the Great Plains and Great Lakes. Compiled by The Nature Conservancy and edited by Don Faber-Langendoen and Kristin Snow, April 2000.

Open Water - This major cover type is to be used for areas with greater than 96% open water, floating algae and/or non-rooted vascular vegetation. Emergent or rooted floating vegetation in rivers, intermittent streams, lakes and wetlands are to be classified under the Herbaceous Vegetation cover type.

Partially drained/ditched - The water level has been artificially lowered, but the area is still classified as wetland because soil moisture is sufficient to support hydrophytes. Drained areas are not considered wetland if they can no longer support hydrophytes. (Cowardin, et al.)

Pasture - Land managed primarily for the production of introduced or native forage plants for livestock grazing. Pasture may consist of a single species in a pure stand, a grass mixture, or a grass-legume mixture. Management usually consists of cultural treatments, such as fertilizer, weed control, reseeding, or renovation, and control of grazing. (NRCS)

Pavement - Artificially covered surface for thoroughfare. Surfaces may include concrete, asphalt, gravel, or brick materials.

Peat soil - Unconsolidated soil consisting largely of undecomposed (fibric peat), slightly decomposed (hemic peat), or mostly decomposed (sapric peat or muck) organic matter accumulated under conditions of excessive moisture. (DNRNH)

Perennial - Plant species with a life-cycle that characteristically lasts more than two growing seasons and persists for several years. (NVCS)

Permanently Flooded - Water covers the land surface throughout the year in all years. Vegetation is composed of obligate hydrophytes. (Cowardin, et al.)

Planted (maintained) - Natural vegetation has been removed or modified and replaced with different types of vegetative cover resulting from anthropic activities. This vegetation is artificial and requires human activities to be maintained over the long term. Nurseries, tree stands (tree farms or windbreaks), crops, ballfields, roadsides, and yards are included in this group. Successful restorations or re-planting of natural communities are not considered as planted because although planted, they are intended to mimic natural cover.

Pre-development vegetation - Native vegetation found in natural and semi-natural communities.

River (Riverine) - Wetlands and deepwater habitats contained within a channel, with the exception of: wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. A channel is "an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water" (Langbein and Iseri 1960:5). Water is usually, but not always, flowing in the

Riverine System. Upland islands or Palustrine wetlands may occur in the channel, but they are not included in the Riverine System. (Cowardin, et al.)

Row cropland - Row crops such as corn and soybeans. (NRCS)

Saturated - The substrate is saturated to the surface for extended periods during the growing season, but surface water is seldom present. (Cowardin, et al.)

Seasonally Flooded - Surface water is present for extended periods especially early in the growing season, but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface. (Cowardin, et al)

Semipermanently Flooded - Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface. (Cowardin, et al)

Short Grasses - Planted grass species typical of 'turf' (bluegrass, fescue, etc). Species composition is typical of regular and frequent mowing.

Shrub - A perennial woody species with a life form that is usually less than 4 to 5 meters or 13 to 16 feet in height at maturity and under optimal growing conditions. Typically, plants have several stems arising from or near the ground, but this term includes short tuft-tree and woody vine species; length of vine may exceed 5 meters; shrub species growth form may be taller than 5 meters or single-stemmed under certain environmental conditions.(NVCS)

Shrubland - Shrubs and dwarf-shrubs with individuals or clumps overlapping to not touching (generally forming more than 25% cover, trees generally less than 25% cover). Shrub cover may be less than 25% where it exceeds tree, herb, and nonvascular cover, respectively. Vegetation dominated by woody vines is generally treated in this class. (NVCS)

Sparse vegetation - Describes vegetation with low total plant cover; abiotic substrate features are dominant; vegetation is scattered to nearly absent and generally restricted to areas of concentrated resources. Total vegetation cover is typically less than 25% and greater than 0%. (NVCS)

Substrate - The soil or other medium on which a community occurs.

Talus - A sloping accumulation of coarse rock fragments at the base of a cliff. (NVCS)

Temporarily Flooded - Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of the temporarily flooded regime. (Cowardin, et al.)

Tree - Perennial, woody species life form with a single stem (trunk), normally greater than 4 to 5 meters or 13 to 16 feet in height at maturity and under optimal growing conditions. Under certain

environmental conditions, some tree species may develop a multi-stemmed or short growth form (less than 4 meters or 13 feet in height). (NVCS)

Understory - The vegetation occurring below the canopy in a plant community. (DNRNH)

Upland Soils - Areas not flooded, or saturated by groundwater, for more than a few days during a normal year. Soils are predominantly mineral and without hydric characteristics (i.e., gleying or mottling).

USNVC - U.S. National Vegetation Classification System for natural community identification developed by The Nature Conservancy and used by some federal agencies. The acronym NVCS is more commonly used.

Vascular plant - Plant with water and fluid conductive tissue (xylem and phloem); includes seed plants, ferns, and fern allies. (NVCS)

Woodland - Open stands of trees with crowns not usually touching (generally forming 25 - 60% cover). Canopy tree cover may be less than 25% in cases where it exceeds shrub, dwarf-shrub, herb, and nonvascular cover, respectively. (NVCS)

APPENDIX D

MLCCS Methodology

Minnesota Land Cover Classification System

User Manual

Version 5.4

Minnesota Department of Natural Resources
Central Region

2004

Preface

The Minnesota Land Cover Classification System (MLCCS) integrates classification of cultural features, non-native vegetation, natural and semi-natural vegetation into a comprehensive land cover classification system. This system is heavily based on two native vegetation classification standards:

> The US National Vegetation Classification System (NVCS). This standard was developed in partnership with The Nature Conservancy and the nationwide state Natural Heritage programs. It represents the first standardized classification of the terrestrial ecological communities of the United States ever developed at a scale fine enough to be used in making local, site-specific conservation decisions. The Federal Geographic Data Committee endorsed it in 1997 as the standard approach to be used by all federal agencies. A copy of this system may be obtained via the world wide web at http://consci.tnc.org/library/pubs/class/index.html
>
> Minnesota's Native Vegetation: A Key to Natural Communities, version 1.5. This standard was developed by the Minnesota DNR Natural Heritage and Nongame Research Program (NHNRP), primarily based on vegetation data collected by the Minnesota County Biological Survey (MCBS) and pre-existing literature on plant communities in Minnesota and adjacent states. A copy of this key may be obtained by contacting DNR Ecological Services, 500 Lafayette Rd., St. Paul , MN, 55155, or by calling 651-296-2835.

Both of these standards have undergone revisions, shifting toward an ecological basis for classifying natural communities. Revisions to the MLCCS will occur when the changes to the NVCS and the Minnesota Key to Natural Communities become formalized, possible in 2004.

The MLCCS uses the natural community terminology developed by the NHNRP. These same terms are used by the Minnesota County Biological Survey (MCBS) on maps of natural communities in the state. However, the MLCCS designates land cover at a given point in time, including areas that would not meet the minimal quality and/or size criteria used by MCBS. Therefore, there will sometimes be differences between mapped polygons in MCBS data layers and MLCCS data layers in the same place.

Comments and suggestions on the Cultural or Natural/Semi-Natural classifications will be appreciated. Please address comments to:

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Introduction

The Minnesota Department of Natural Resources (DNR) Metro Region, along with other federal, state, regional and local units of government, has developed a natural resource inventory classification system to accurately map all land cover types. The system is unique in that it categorizes urban and built-up areas strictly in land cover terms. For natural resources, the system fully incorporates the Minnesota's Native Vegetation: A Key to Natural Communities, version 1.5 developed by the Minnesota DNR Natural Heritage and Nongame Research Program (NHNRP), and the newly developed The US National Vegetation Classification System (NVCS) developed in partnership with The Nature Conservancy and the nationwide state Natural Heritage programs.

The overall objective of the Minnesota Land Cover Classification System (MLCCS) is to standardize land cover identification and interpretation. The MLCCS was developed as a result of unanswered questions regarding natural resource identification, protection and restoration efforts in the seven-county metropolitan area.

Common questions are:

- Where are the natural resources that need protection in face of development?
- Where are the degraded natural sites that would benefit from restoration efforts?
- What is the degradation that has occurred?
- Where are sites adjacent to existing natural areas that could be restored to natural communities?
- What should the restored community be?
- What is the imperviousness of the watershed?
- What are the actual vegetation cover types associated with various land use classes?

The MLCCS provides a standardized method to collect data that can be used to answer these questions. The MLCCS is unique in that it emphasizes vegetation land cover instead of land use, thus creating a land cover inventory especially useful for resource managers and planners.

The classification system is a five-level hierarchical design, permitting a gradation of refinement relevant to any land cover mapping project. The very highest level, or the system level, is the division between Natural/Semi-Natural cover types and Cultural cover types. Cover types in the Natural/Semi-Natural system are composed of all naturally occurring types and are subdivided into Forests, Woodlands, Shrublands, Herbaceous, Nonvascular, Sparse Vegetation and Water. The Cultural classification system is composed of cover types influenced by humans, and are subdivided into Areas with > 4% Artificial Surfaces and Cultural Vegetation.

The Natural/Semi-Natural classification system is a hybrid of the US National Vegetation

Classification System (NVCS) and Minnesota's Native Vegetation: A Key to Natural Communities, version 1.5 developed by the Minnesota DNR Natural Heritage and Nongame Research Program (NHNRP). The NVCS is used for the top three levels of the system, identifying the physiognomic attributes of the vegetation. Thus, level one identifies the general growth patterns (forest, woodland, shrubland, etc.); level two identifies plant types (deciduous, coniferous, grasslands, forbs, etc.); and level three identifies the hydrology of the soil (upland, seasonally flooded, saturated, etc.) or a refinement of plant type (tall grass, forbs, etc.). Levels four and five identify the actual plant species composition and uses Minnesota's Native Vegetation: A Key to Natural Communities community type definitions (e.g. floodplain forest, rich fen sedge subtype, jack pine barrens, etc.).

The Cultural classification system is designed to identify the presence of artificial surfaces (impervious surfaces) and vegetation patterns. Most other cultural classification systems, such as the USGS's Anderson system, employ land use terminology: Urban, Commercial or Residential. The MLCCS continues to use physiognomic attributes regardless of the area's land use. Level one identifies where artificial surfaces are present (artificial surfaces vs. cultivated land). Level two identifies the dominant vegetation (trees, shrubs, herbaceous). Level three identifies the plant type (deciduous, coniferous, etc.). Level four identifies the percent of imperviousness or upland versus hydric soils. Level five identifies the specific plant species in the area.

For each polygon identified, modifiers may be added to further define the characteristics of the site. Possible modifier codes include imperviousness, land use, vegetation disturbances or management, natural quality, tree species, forestry (e.g., percent canopy and DBH) and water regimes.

Typical data needed to identify land cover using the MLCCS includes Minnesota County Biological Surveys, County Soil Surveys, National Wetland Inventory, Color infrared aerial photographs, digital orthophoto quadrangles and rare features data from the Natural Heritage Information System (obtained by filling out a Data Request Form, available on the DNR's web site, or obtained from the Section of Ecological Services, MN DNR). This base information is usually sufficient to identify polygons to the third level of the MLCCS codes. Field inspection by ecologists is usually required for modifier attributes and to identify natural community types in the fourth and fifth levels of the MLCCS. Field inspection is also used to confirm and refine polygon delineation.

The Classification System

Land Cover vs. Land Use

Information on land cover and land use is required in many aspects of land use planning and policy development. It also is required for monitoring and/or modeling environmental change. Many land use/cover classification systems and innumerable maps have been created, most of which blur the difference between land use and land cover. With the escalating concern of land conversion by population growth, there is an urgent need for better matching of land cover and its use. With the rapid increase of available spatial data, along with wider use of remote sensing, it is increasingly possible to map, evaluate and monitor land cover and land use over large areas.

The distinction between land cover and land use is fundamental. In previous classifications and legends, the two have often been confused. They should strictly be defined as follows:

Land Cover is the observed physical cover, as seen from the ground or through remote sensing, including the vegetation (natural or planted) and human constructions (buildings, roads, etc.) that cover the earth's surface. Water, ice, bare rock, or sand surfaces count as land cover.

Land Use is based upon function, the purpose for which the land is being used. Thus, a land use can be defined as a series of activities undertaken to produce one or more goods or services. A given land use may take place on one or more than one piece of land, and several land uses may occur on the same piece of land. Definition of land use in this way provides a basis for precise and quantitative economic and environmental impact analysis, and permits precise distinctions between land uses if required.

There are many classification systems in existence, yet few of them purely address land cover. Existing land cover classification systems either revert to land use definitions in urban/built up and agricultural areas, or simply do not interpret these areas.

The MLCCS identifies land cover in areas traditionally identified by land use (e.g., urban, built up and agricultural areas) by identifying the structure of the vegetation present and including the presence of human activities as it presents itself from above. Cultural Systems are areas where the total vegetation cover is less than 96% because of direct human alteration (e.g., presence or roads, buildings) or areas where the dominant vegetation has been maintained, planted or cultivated (e.g., agricultural lands, parks, windbreaks). The MLCCS only identifies the types of vegetation present. Buildings, roads and other manmade surfaces are all considered artificial surfaces. These artificial surfaces are lumped together as impervious surfaces. Thus the MLCCS may identify a typical residential area as: *Short grasses and mixed trees with 26% to 50% impervious cover*.

Native communities are included in the Cultural Systems, but an impervious component has

been added. These communities contain the species of natural communities, though due to the presence of impervious surfaces, they may no longer function as such. Examples of this type of cover are large-lot residential developments located in natural areas such as oak forests or woodlands. While there is significant native and natural vegetation remaining, the presence of the matrix of roads and buildings removes it from being considered a natural community. The MLCCS may identify such a community as: *Oak (forest or woodland) with 11% to 25% impervious cover*.

One of the major innovations of the MLCCS is the application of a pure land cover standard to inventory all lands. The MLCCS recognizes that all lands, regardless of use, have some ecological importance. Watershed management is one ecological application perfectly suited for the MLCCS. Managing the interaction of human activities and the health of a watershed's terrestrial and aquatic ecosystems is dependent, in part, on the knowledge of what the land cover's vegetative and impervious components are. It does not matter to a lake if the impervious surface is a residential roof or a road; the effects are the same. The goal of the MLCCS is to provide a land cover classification system for standardized identification and interpretation by a broad base of users.

Schematic Tables

System Overview

Super System	Terrestrial								
System	Cultural		Natural / Semi-natural						
Level 1	Artificial surfaces with <96% Vegetation	Cultural Vegetation	Forests	Woodland	Shrubland	Herbaceous	Nonvascular	Sparse Vegetation	Open Water
numerical code	10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000

Cultural Land Cover System

	10,000												
level 1	**Artificial surfaces and associated areas (up to 96% vegetation cover) -** Areas which have an artificial cover which is the result of human activities such as construction (e.g.; buildings, pavement), extraction sites (e.g.; open mines, quarries, pits) and waste disposal sites. This class is determined by the presence of manmade impervious surface. Pavement is an artificially covered surface for a thoroughfare. Surfaces may include concrete, asphalt, gravel, or brick materials.												
level 2	Trees			Shrubs		Herbaceous					Minimal Vegetation		
level 3	Conifers	Decid-uous	Mixed Con./Dec.	Mixed shrubs	Shrubs w/trees	Grasses w/trees	Grasses		Gardens		Buildings / Pavement		Exposed earth
level 4	% imper-vious	% imper-vious	% imper-vious	% imper-vious	% imper-vious	% imper-vious	% impervious		% impervious		% impervious		% impervious
level 5	Genus or community types (Alliance)					Genus | grass	short | long grass	prairie	vege-table	flow-ers	pave-ment	build-ings	mines, pits, etc.

	20,000										
level 1	**Planted or Cultivated Vegetation (greater than 96% vegetation cover)** - Cultivated is vegetation that is planted or treated with the intent on harvest, often on an annual basis. Regular modification of cover is expected. Planted vegetation refers to sites where the natural vegetation has been removed or modified and replaced with different types of vegetative cover resulting from anthropic activities. This vegetation is usually non-native and requires human activities to be maintained over the long term. Nurseries, tree stands (e.g. tree farms or windbreaks), pastures and ball fields are included in this group. Restorations or replanting of natural communities are not considered in this category because although they are planted, they are intended to mimic natural cover.										
level 2	Trees			Shrubs and vines			Planted Herbaceous			Cultivated Herbaceous	
level 3	Conifers	Decid-uous	Mixed Con./Dec.	Conifers	Decid-uous	Mixed Con./Dec	Grasses w/trees	Grasses	Grasses and Forbs	Row Cropland	Close Grown Cropland
level 4	Upland Soils | Hydric Soils						Upland Soils | Hydric Soils			Upland Soils | Hydric Soils	
level 5	Genus or community types (Alliance)						short grass | long grass			Crop species	

Natural / Semi-Natural Land Cover System

	30,000		
level 1	**Forests** - Trees with their crowns overlapping (generally forming 60 - 100% cover)		
level 2	Coniferous forest	Deciduous forest	Mixed coniferous - deciduous forest
level 3	Soil Hydrology [Upland | Saturated | Temporarily flooded | Seasonally flooded]		
level 4	MN DNR Natural Heritage=s community types		
level 5	MN DNR Natural Heritage=s community subtypes		

	40,000		
level 1	**Woodland** - Open stands of trees with crowns not usually touching (generally forming 25 - 60% cover). Canopy tree cover may be less than 25% in cases where it exceeds shrub, dwarf-shrub, herb, and nonvascular cover, respectively.		
level 2	Coniferous woodland	Deciduous woodland	Mixed coniferous - deciduous woodland
level 3	Soil Hydrology [Upland Soils]		
level 4	MN DNR Natural Heritage=s community types		
level 5	MN DNR Natural Heritage=s community subtypes		

	50,000	
level 1	**Shrubland** - Shrubs generally greater than 0.5 m tall (dwarf-shrubland are low-growing shrubs usually under 0.5 m tall) with individuals or clumps overlapping to not touching (generally forming more than 25% cover, trees generally less than 25% cover). Shrub cover may be less than 25% where it exceeds tree, herb, and nonvascular cover, respectively. Vegetation dominated by woody vines is generally treated in this class.	
level 2	Coniferous / Evergreen shrubland	Deciduous shrubland
level 3	Soil Hydrology [Upland | Saturated | Temporarily flooded | Seasonally flooded]	
level 4	MN DNR Natural Heritage=s community types	
level 5	MN DNR Natural Heritage=s community subtypes	

	60,000				
level 1	**Herbaceous** - Herbs (graminoids, forbs, and ferns) dominant (generally forming at least 25% cover; trees, shrubs, and dwarf-shrubs generally with less than 25% cover). Herb cover may be less than 25% where it exceeds tree, shrub, dwarf-shrub, and nonvascular cover, respectively.				
level 2	Grasslands or emergent vegetation	Grasslands with sparse trees (savannas)	Perennial forb vegetation	Hydromorphic rooted vegetation	Annual grasslands or forb vegetation
level 3	Tall grass | Medium-tall grass | Temporarily flooded | Saturated | Seasonally flooded | Semipermanently flooded | Intermittently exposed | Permanently flooded	Grassland with sparse deciduous trees | Grassland with sparse coniferous or mixed deciduous / coniferous trees	Saturated | Upland	Semipermanently flooded | Intermittently exposed | Permanently flooded	Seasonally flooded
level 4	MN DNR Natural Heritage=s community types			National Vegetation Classification System Alliances	
level 5	MN DNR Natural Heritage=s community subtypes			National Vegetation Classification System Associations	

	70,000
level 1	**Nonvascular** - Nonvascular cover (bryophytes, non-crustose lichens, and algae) dominant (generally forming at least 25% cover). Nonvascular cover may be less than 25% where it exceeds tree, shrub, dwarf-shrub, and herb cover, respectively.
level 2	Lichen
level 3	Lichen vegetation with sparse trees
level 4	MN DNR Natural Heritage=s community types

	80,000						
level 1	**Sparse Vegetation** - Abiotic substrate features dominant. Vegetation is scattered to nearly absent and generally restricted to areas of concentrated resources (total vegetation cover is typically less than 25% and greater than 0%)						
level 2	Consolidated Rock		Boulder, Gravel, Cobble, or Talus		Unconsolidated Material		
level 3	Cliffs	Level Bedrock	Lowland Talus / Scree	Cobble / Gravel Beaches and Shores	Sand Flats	Temporarily Flooded Sand Flats	Seasonally / Temporarily Flooded Mud Flats
level 4	National Vegetation Classification System Alliances						
level 5	National Vegetation Classification System Associations						

	90,000			
level 1	**Open Water** - This major cover type is to be used for open water with no emergent vegetation. Emergent vegetation in rivers, intermittent streams, lakes and wetlands are to be classified under the Herbaceous Vegetation cover type. Open water divisions and classifications are based on the National Wetlands Inventory Cowardin classifications.			
level 2	River (Riverine)		Lake (Lacustrine)	Wetland Open Water (Palustrine)
level 3	Slow river	Fast River	Limnetic | Semipermanently flooded | Intermittently exposed | Permanently flooded | Littoral	Intermittently exposed | Permanently flooded | Open water
level 4			Floating Algae | Floating Vascular Vegetation (NWI classifications)	

The Classification System

Land Cover Coding Schemes

The MLCCS is a typical hierarchical classification system. The organization of the numerical and alphanumerical codes reflect this multi-level nested hierarchy.

Numerical codes

The numerical codes use a five digit number. The digits are organized left to right and each digit represents a level of the classification system; the first digit represents level one, the second digit represents level two, etc.

The five levels of the MLCCS are represented by a five digit number:

level one	level two	level three	level four	level five
first digit	second digit	third digit	fourth digit	fifth digit

Examples:
30000 - Interpreted to the first level, thus represents *Forests*
32000 - Interpreted to the second level, thus represents *Deciduous forest*
32100 - Interpreted to the third level, thus represents *Upland deciduous forest*
32110 - Interpreted to the fourth level, thus represents *Oak forest*
32113 - Interpreted to the fifth level, thus represents *Oak forest dry subtype*

Alphanumerical codes

The alphanumerical codes use a unique combination of numbers and letters (characters) for each level. The unique character clusters for each level are separated by periods.

level one	level two	level three	level four	level five
arabic number	two lowercase letters	two uppercase letters	three characters	three characters

Examples:

3	Interpreted to the first level, thus represents *Forests*
3.de	Interpreted to the second level, thus represents *Deciduous forest*
3.de.UP	Interpreted to the third level, thus represents *Upland deciduous forest*
3.de.UP.nOA	Interpreted to the fourth level, thus represents *Oak forest*
3.de.UP.nOA.nOD	Interpreted to the fifth level, thus represents *Oak forest dry subtype*

Remote Sensing Coding Schemes

Remote sensing information is tracked with two attribute fields - **img_code** for the five digit land cover code and **img_type** for the image used.

Numerical land cover codes interpreted from remote sensing

If a land cover code has been derived from remote sensing, then the five digit numerical code is placed in the img_code field. This field should be populated whenever a land cover code has be derived from remote sensing techniques, even if there is also a land cover code derived from field inspection. A polygon may contain a land cover codes in the both the img_code field and the fld_code field. As the remote sensing source may be dated, many times these codes will be different. If the land cover code has only been derived from field inspection, then an img_code is not necessary.

Remote sensing image type codes

The remote sensing source is tracked in the img_type field. This refers to the type and date of the image used for remote sensing interpretation of the land cover code. Different remote sensing sources can be reference for specific polygons, or the user can list all the remote sensing sources used for the entire project. Format for the sources should be "Year (YYYY) Originator and Type". For example, typical remote sensing sources:
2000 Met Council BW DOQ
2003 FSA Color DOQ
1994 DNR CIR

The information should be entered as a text string with a pipe "|" used to delimit the items. For example, assuming all of the above sources were used for the project, the img_type field would be populated with "2003 FSA Color DOQ | 2000 Met Council BW DOQ | 1994 DNR CIR". List sources in chronological order, with the most current first.

Field Work Coding Scheme

Field work derived information is tracked with three attribute fields - **fld_code** for the five digit land cover code, **fld_date** for the date of the field work, and **fld_level** for the level of which the site was field visited.

Numerical land cover codes interpreted from field visits

If a land cover code has been derived from visiting the site in the field, then the five digit numerical code is placed in the fld_code field. This field should be populated whenever a land cover code has be derived from a field site visit, even if there is also a land cover code derived from remote sensing interpretation. A polygon may contain a land cover codes in the both the img_code field and the fld_code field. As the remote sensing source may be dated,

many times these codes will be different. If the land cover code has only been derived from field inspection, then an img_code is not necessary.

Field date codes

The fld_date field tracks the date the site was visited. This can reflect either the exact day of the visit or generalized to the month or year. The format for the information is an eight character string representing "year month day" (yyyymmdd). Thus, July 16, 2004 would be entered as 20040716. Use "01" as a place holder to represent if the day or month has not been tracked. Thus, 20040701 represents July, 2004 (not July 1, 2004), and 20040101 represents the year 2004 (not January 1, 2004). If field work was done on the first day of the month and one wants to record a date of the field, use a date of "02" instead of "01". Thus, 20040702 represents field work done on July 1, 2004 and/or July 2, 2004.

Field check levels

A site visit level code must be used for all polygons that have been field visited and have a fld_code value. The numerical code represents the degree the site was visited. These codes can be applied to all land cover types; artificial, cultural, natural or semi-natural. Natural communities must be field checked to be given a natural quality ranking. The natural quality ranking are based on the DNR's Natural Heritage Element Occurrence Ranking Guidelines (see below "Natural Quality Modifiers" and appendix 2: Element Occurrence system). Valid field check level codes are:

0 = site not visited

1 = viewed the site from a distance

Was not able to walk to the site, but was able to discern the dominant vegetation. Masses of invasive species may be visible, and thus were recorded (buckthorn, reed canary grass, crown vetch, etc). Depending on the perceived quantity of invasive species, a natural quality ranking of D may or may not be discernable.

2 = visited the edge of the site

Walked or drove to the edge of the site, and was able to inventory some invasive species and speculate on its natural quality. Depending on the perceived quantity of invasive species, a natural quality ranking of C or D may or may not be discernable.

3 = visited part of the site

Walked into the site and was able to confidently inventory most invasive species present and assess its natural quality - A, B, C or D. Wetlands that are inventoried from the edges in several places should be given this field check level.

4 = visited the entire site

Was able to inventory all invasive species present and assess the site's natural quality - A, B, C or D.

Modifier Coding Schemes

Modifiers are to be used to further define a site and are considered equal in weight to the initial MLCCS code. In cases where a site has been field checked, appropriate modifiers should be applied. Polygon attribute tables will accommodate modifiers from each grouping of modifier codes. Definitions for many of the modifiers are included, however most modifiers are self explanatory. Field inspections should be conducted when applying modifier codes. Modifiers can be applied while doing the initial air photo interpretation, though caution should be used in making modifier decisions only on air photo interpretation. With practice and experience, a person may be able to gain confidence to apply modifiers from air photo interpretation only.

- Percentage of Impervious Cover. Enables one to give an exact percentage of imperviousness to a polygon, thus improving stormwater run-off model results.
- Current Land Use. List of most common land uses. Permits the tracking of a polygon's land use classification.
- Modifiers that identify the current vegetation management practices on a site.
- Modifiers that identify types of natural disturbances to the community.
- Modifiers that identify the natural quality of a site.
- Invasive species.
- Modifiers that identify the successional stage of a forest.
- Percentage of tree canopy cover.
- Average diameter of trees within a forest
- Water regime (NWI modifiers)
- Built water features
- Wetland features
- Stream features
- Spring features

Natural quality modifiers

The natural plant community sites can be given a natural quality ranking, based on the DNR's Natural Heritage's Element Occurrence Ranking Guidelines* (EOR). As stated in the EOR document:

> Element Occurrence (EO) Ranking Guidelines describe the manner in which occurrences of specific Minnesota natural communities are ranked by ecologists. On a continuum of "A" through "D," and "A" rank indicates an excellent quality natural community, while "D" indicates a poor quality natural community. To assess quality,

* http://files.dnr.state.mn.us/ecological_services/nhnrp/eoranks2001.pdfp/eoranks2001.pdf

ecologists primarily consider the presence or absence of unnatural human-induced disturbances such as logging, plowing, overgrazing and development.

These guidelines were written by Minnesota Natural Heritage Program ecologists based primarily on field experience to date, and will be modified as more data are collected. The authors have a great deal of field experience in some natural communities, and less in others. The guidelines are designed to be used by experienced ecologists who have some knowledge of the community across its entire range in the state.

Refer to the EOR Guidelines to evaluate the specific natural communities. Non-native, altered and disturbed communities should only be given a non-native ranking (NN or NA). Valid codes and general definitions modifier m_34X are:

A = highest quality natural community, no disturbances and natural processes intact. Site must be visited entirely or partially to accurately assess its natural quality at this level (fld_level = 3 or 4).

B = good quality natural community. Has its natural processes intact, but shows signs of past human impacts. Low levels of exotics. Site must be visited entirely or partially to accurately assess its natural quality at this level (fld_level = 3 or 4).

C = moderate condition natural community with obvious past disturbance but is still clearly recognizable as a native community. Not dominated by weedy species in any layer. Minimally, the site must be visited from the edge to accurately assess its natural quality at this level (fld_level = 2, 3 or 4).

D = poor condition of a natural community. Includes some natives, but is dominated by non-natives and/or is widely disturbed and altered. Herbaceous communities may be assessed with this ranking from a distance (fld_level = 1) if large masses of invasive species are present and the entire community is visible.

NA = Native species present in an altered / non-native plant community. This NA ranking can only be used if the site is field checked from the edge or to a greater degree (fld_level 2, 3, or 4), thus confirming the presence of native species within a non-native community.

NN = Altered / non-native plant community. These semi-natural communities do not qualify for natural quality ranking. Using NN signifies the site has been field checked and confirms it is a semi-natural community.

Inventory Process

The standardized MLCCS inventory methodology

Materials

Printed materials:

DNR's Natural Heritage's Element Occurrence Ranking Guidelines
http://files.dnr.state.mn.us/ecological_services/nhnrp/eoranks2001.pdfp/eoranks2001.pdf
Soil Survey books
Field guide books (see Appendix 7)
Color Infrared Photos[+] and a stereoscope
Color Aerial Photos
MLCCS Manual and MLCCS Dichotomous Field Key
[+] Photos available from DNR Forestry: http://maps.dnr.state.mn.us/forestry/photos/

Digital materials:

Minnesota County Biological Survey natural community polygons*
National Wetlands Inventory polygons*
Soil polygons*
Ecological Classification System*
Pre-settlement Vegetation data (Marschner map)*
Digital Orthophoto Quads (1 meter resolution or better)*
Color Infrared Photos (rectified)[+]
Color Aerial Photos - various counties or Farm Service Agency
MLCCS dichotomous key for the Palm
* Can be downloaded without charge from the DNR data deli: http://deli.dnr.state.mn.us/
[+] Unrectified images available from DNR Forestry:
http://maps.dnr.state.mn.us/forestry/photos/

Procedure

Create hardcopy base maps

Tile project site into print areas at a 1:3,000 or greater scale. Have the most current DOQs as the base layer, with NWI and MCBS polygon outlines on top. Label the Cowardin class from the NWI and the natural community from the MCBS.

Broadly delineate level 1 & 2

Divide the study area into broad physiognomic plant characteristic, as depicted in level 1 and level 2. For example, delineate the boundaries between herbaceous, forest and shrub communities. Artificial surfaces and planted communities can likewise be delineated at level 1 or level 2. These are obvious boundaries visible from aerial photos, and is typically done with colored pencils on the printed 1:3,000 DOQs.

The Minimum Mapping Unit and levels 3, 4, & 5

Minimum Mapping Unit is 0.5 hectare for natural vegetation (1.23 acres) and 1 hectare for cultural communities (2.47 acres). Consequently, all land cover types that meet this minimum size must be delineated. The size of the minimum mapping unit (MMU) was selected to ensure detailed and accurate data while balancing typical budget constraints. If the project budget permits, a smaller MMU can be applied. This commonly occurs when delineating wetlands or municipal parks. Adherence to the MMU is especially important when delineating level 4 & 5 natural communities. Also associated with the MMU is a recommended minimum polygon width of 50 feet.

Sampling techniques and the dichotomous key

Standardized interpretation of the vegetation communities and ecological systems is the primary goal of this manual. MLCCS data generation relies heavily on aerial photo interpretation complemented by field work. The Federal Geographic Data Committee (FGDC) Vegetation Classification guidelines require that field data be collected "using standard and documented sampling methods." To standardize the interpretation of natural communities, the use of the dichotomous key is mandatory. The MLCCS key is a visual sampling of the dominant plant species in the community, with the general ecology of the site taken into consideration. It is imperative that field staff new to the MLCCS use the dichotomous key until they fully understand how the MLCCS defines all plant communities in their project area. Failure to use the MLCCS key will result in non-standard plant community interpretation, and will most likely result in the data not being included in the regionwide DNR-endorsed GIS layer.

Also associated with the standardized data collection is the Field Check Form, on the final page of the manual for easy duplication. This form helps further to standardize natural community interpretation.

Modifiers to land cover codes

The modifier attribute fields have been set up to permit the application of multiple modifiers for each polygon. The modifier fields are grouped around a common theme, from which the user can choose one modifier code. The exception to this rule are the modifiers for invasive plant species, in that each plant species is given its own unique attribute field. All invasive plant species identified in natural/semi-natural field checked polygons must be recorded. The use of natural community quality modifies are also strongly encouraged.

Interpretation and digitizing standards

Line Quality and Accuracy

Line error should be no more than 1/8" at a 1:3,000 scale. This represents approximately 30 feet horizontal accuracy. This accuracy standard applies to both the interpretation of polygon boundaries on the DOQs, and to digitizing these field-interpreted polygons into a GIS.

Interpretation / Label Quality and Accuracy

Land cover interpretation accuracy goal is 100% at level 1, 95% at level 3 and 90% at level 4/5. Field checking all (or most) public property in the project site is strongly recommended.

There should be 100% accuracy between the labels on the field maps (paper) and the digitized versions.

Polygon Attribute Table standards

One problem typically encountered with land cover inventory projects in rapidly developing areas is the quickly changing cover type of the landscape. To address this problem, specific fields have been created that refer to the land cover interpretation source and date. For example, field item "img_code" tracks the land cover code interpreted from aerial photos, while "img_type" tracks the type and date of the image used. Thus, img_code = 32160 and img_type = "1991 USGS BW DOQ | 1994 DNR CIR", refers to a polygon of aspen forest derived from 1991 USGS DOQs and 1994 color infrared aerial photographs. When this site is field checked, it might be determined to be a different land cover type than was interpreted off the aerial photo. To record this change, use the "fld_code" field to track the land cover type derived from field inspection and "fld_date" tracks the date the field visit occurred. With values in both img_code and fld_code, one can discern how the land cover has changed in relative short window of time.

The attribute field item C_NUM should be populated with the most current classification code from the img_code and fld_code fields. The C_NUM field is the final land cover code for MLCCS data, and is used for cartographic products and data analysis. Field item C_ALPHA is the alphanumeric equivalent of C_NUM, and automatically populated when using the MLCCS digitizing extension. This item will greatly facilitates sorting and analyzing the data for horizontally common features, such as "saturated" (c_alpha = WB), "26-50% impervious" (c_alpha = i50) or "altered / non-native communities" (c_alpha = nAT). See "Definitions of the alphanumeric characters" for complete detail

Polygon Attribute Table format

ITEM NAME	DESCRIPTION	RULES FOR POPULATING VALUES	DEFINITION
AREA	Area in square meters	Automatically generated in GIS software.	number
PERIMETER	Perimeter of polygon in meters	Automatically generated in GIS software.	number
MLCCSPY3_#	Internal Arc/Info polygon ID	The degree the polygon was field checked, from the field check form.	number
MLCCSPY3_ID	Arc/Info polygon ID	The degree the polygon was field checked, from the field check form.	number
UNIQUE_ID	Project defined polygon ID	A unique number assigned to each polygon to help track it for field checking. The DNR assigns the numbers based on the USGS DOQ quarter-quad number and a print tiling scheme. Not mandatory.	16 characters
C_NUM	Final land cover code as 5 digit number	This field will duplicate the most accurate land cover code for each polygon - either field visit (fld_code) or remote sensing (img_code). Mandatory	5 digit number
C_ALPHA	Final land cover code in alphanumeric format	The alphanumeric code equivalent to C_NUM. Automatically populated with MLCCS tools.	16 characters
C_TEXT	Final land cover code as a text description	A text description of the land cover code. Automatically populated with MLCCS tools.	125 characters
FLD_CODE	Land cover code derived from field work.	The land cover code derived from field interpretation. Can be applied to any land cover type. Must be present if invasive species or natural quality modifiers are used.	5 digit number

FLD_DATE	Date of field work (year-month-day with no delimiters, e.g. 20043019)	The date the polygon was field visited - enter in a yyyymmdd format. Use 01 as a place holder if the day or month was not tracked, e.g. 20040601 represents June, 2004, and 19990101 represents data from 1999. Mandatory if FLD_CODE is populated.	8 characters
FLD_LEVEL	Field check level (from the Field Check Form in the manual)	The degree the polygon was field visited: 0 = site not visited 1 = viewed the site from a distance 2 = visited the edge of the site 3 = visited part of the site 4 = visited the entire site See manual page for details. Mandatory if FLD_CODE is populated.	1 digit number
IMG_CODE	Land cover code derived from aerial photo or image interpretation	The land cover code derived by remote sensing, typically using aerial photos or satellite images. Several images can be used in concert. Not mandatory if the land cover of the site was initially interpreted from field work.	5 digit number
IMG_TYPE	List of date and type of images, e.g. [2003 FSA color DOQ | 2000 Met Council BW DOQ]	List the most current image first, descending in chronological order. Use "yyyy source and image type" with a pipe "|" as delimiters. Standard entries: 2003 FSA color DOQ 2000 Met Council BW DOQ 1994 DNR CIR	250 characters

M_0XX	Modifiers for percent imperviousness, 000 = 0% to 100 = 100%	Valid values are 000 to 100	3 digit number
M_2XX	Modifiers for cultural land use	Valid values are 210 to 276	3 digit number
M_30X	Modifiers for vegetation management	Valid values are 301, 302, or as a list "301, 302"	16 characters
M_31X	Modifiers for management type	Valid values are 310 to 315, or as a list, e.g. "310, 311, 315"	25 characters
M_32X	Modifiers for natural community disturbance types	Valid values are 321 to 329, or as a list, e.g. "321, 323, 326"	50 characters
M_33X	Old modifiers for the quality of the natural community. NO LONGER USED.	NO LONGER USED.	3 digit number
M_34X	Modifiers for the quality of the natural community, based on DNR's Natural Heritage Element Occurrence Rank (EOR).	Valid values are: A = highest quality natural community B = good quality natural community C = moderate condition natural community D = poor condition of a natural community NA = Native species present in an altered/non-native plant community NN = Altered / non-native plant community FLD_LEVEL must be => 3 for a A or B ranking FLD_LEVEL must be => 2 for a C or D ranking FLD_LEVEL must be => 1 for a NA or NN ranking	2 characters

M_400	Overgrown Savanna	Valid value is 400. FLD_LEVEL must be => 2	3 digit number
M_401	Overgrown Woodland	Valid value is 401. FLD_LEVEL must be => 2	3 digit number
M_402	Purple Loosestrife	Valid values are: 0 = unknown, or if field checked, plants not observed 1 = observed, unknown quantity 2 = 1 to 5% coverage 3 = 6 to 25% coverage 4 = 26 to 50% coverage 5 = 51 to 75% coverage 6 = 76 to 100% coverage FLD_LEVEL must be => 1	3 digit number
M_403	Eurasian Watermilfoil	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_404	Curly-leaf Pondweed	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_405	Flowering Rush	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_406	Narrow-leaf Cattail	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_407	Crown Vetch	Valid values are 1, 2, 3, 4, 5, 6	3 digit

		FLD_LEVEL must be => 1	number
M_408	Common Buckthorn	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 1	3 digit number
M_409	Leafy Spurge	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 1	3 digit number
M_410	Tartarian Honey Suckle	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_411	Garlic Mustard	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_412	Reed Canary Grass	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 1	3 digit number
M_413	Smooth Brome	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_414	Spotted Knapweed	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_415	Exotic Thistle	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_416	Siberian elm	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_417	Phragmites	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number

M_418	Grecian Foxglove	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number

M_419	Amur Maple	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_420	Black locust	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_421	Absinthe sage - *Artemisia absinthium*	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_499	Other invasive species	Valid values are 1, 2, 3, 4, 5, 6 FLD_LEVEL must be => 2	3 digit number
M_5XX	Modifiers for tree species	500 to 546 or as a list, e.g. "512, 524, 530"	50 characters
M_60X	Modifiers for forest dynamics	601 to 604	3 digit number
M_61X	Modifiers for percentage of tree canopy, numerical range	610 to 616	3 digit number
M_62X	Modifiers for cover size (average diameter of trees)	621 to 629	3 digit number
M_71X	Modifiers for NWI regimes	710 to 716	3 digit number
M_72X	Modifiers for built water features	720 to 726 or as a list, e.g. "720, 723"	25 characters

M_73X	Modifiers for wetland features	730 to 734 or as a list, e.g. "730, 733"	25 characters

M_74X	Modifiers for stream features	740, 741 or as a list, "740, 741"	16 characters
M_75X	Modifier for spring features	750	3 digit number
NOTES	Comment field		250 characters
SOURCE	Author of data (interpretation and digitizing)	Mandatory field - state "organization, ecologist, digitizer (if different)", e.g. "ACD, R. Biske" or "EOR, M Arikian, J. Naber"	100 characters
ACRES	Polygon area calculated in acres	Automatically populated with MLCCS tools	250 characters

Modifier Codes

Modifiers are to be used to further define a site and are considered equal in weight to the initial MLCCS code. In cases where a site has been field checked, appropriate modifiers should be applied. Polygon attribute tables will accommodate modifiers from each grouping of modifier codes. Definitions for many of the modifiers are included, however most modifiers are self explanatory. Field inspections should be conducted when applying modifier codes. Modifiers can be applied while doing the initial air photo interpretation, though caution should be used in making modifier decisions only on air photo interpretation. With practice and experience, a person may be able to gain confidence to apply modifiers from air photo interpretation only.

0XX Modifiers for Percent Imperviousness

The 000-100 codes are for percent impervious. All 101 codes may be used. Example, if an area is calculated to be 37% impervious, then the correct modifier code would be 037. Average imperviousness may be estimated using the following averages developed by lot size for the SCS TR-55 Model (Urban Hydrology for Small Watersheds).

000 - 0% impervious
012 - 12% impervious (2 acre lot)
020 - 20% impervious (1 acre lot)
025 - 25% impervious (2 acre lot)
030 - 30% impervious (1/3 acre lot)
038 - 38% impervious (1/4 acre lot)
065 - 65% impervious (1/8 acre lot)
072 - 72% impervious (Large buildings)
085 - 85% impervious (large buildings or pavement)
096 - 96% impervious
100 - 100% impervious

2XX Modifiers to identify Land Use

In the metro area land use data is usually readily available and will not be required to be collected for land cover information. In areas where this information is not available, the MLCCS may incorporate land use nomenclature. However, MLCCS polygons will have been delineated by land cover, and thus a specific polygon may require several applicable land use modifiers.

210 - Residential
211 - Low Density Residential (one dwelling unit per acre)
212 - Medium Density Residential (two to five dwelling units per acre)
213 - High Density Residential (greater than five dwelling units per acre)

220 - Commercial / Industrial
- 221 - Commercial
- 222 - Industrial
- 223 - City Center
- 224 - Institutional
- 225 - Corporate Park
- 226 - Recreational
- 227 - Utility
- 228 - Brownfield
- 229 - Other

230 - Transportation (Roads & Railroads)
- 231 - Roads
- 232 - Railroads
- 233 - Parking Lot
- 234 - Runway
- 235 - Marina / Barge Tie-ups
- 236 - Other

240 - Open space use
- 241 - Parks (picnic grounds, ball fields, playgrounds)
- 242 - Golf Course
- 243 - Big Lawn
- 244 - Public Garden
- 245 - Cemetery
- 246 - Greenways
- 247 - Trail corridor
- 248 - Natural area / preserve

250 - Pavement
- 251 - Unimproved (Dirt)
- 252 - Gravel
- 253 - Bituminous
- 254 - Concrete
- 255 - Porous Pavement
- 256 - Brick / Cobblestone
- 257 - Other

260 - Farm buildings
- 261 - Farmstead
- 262 - Feeding Operation

270 - Agricultural field methods
- 271 - Straight row
- 272 - Crop residue

273 - Contoured
274 - Terraced
275 - Pasture
276 - Hayfield

3XX Modifiers to further define vegetation community

30X - Modifiers that reflect current vegetation management of a site
301 - Planted community
302 - Managed for wildlife

31X - Natural community with active vegetation management
310 - undefined vegetation management
311 - burned
312 - mowed
313 - chemical application
314 - brush cutting
315 - tree thinning

32X - Modifiers that reflect types of disturbances observed
321 - Natural community disturbed by wind
322 - Natural community disturbed by flood
323 - Natural community disturbed by fire
324 - Natural community disturbed by disease
325 - Recently clear-cut
326 - Natural community disturbed by non-native plants
327 - Natural community disturbed by major cultural activity
328 - Natural community disturbed by unknown factors
329 - Monocultural vegetation

33X - NOT USED ANYMORE
Old modifiers that reflected natural quality of a polygon
331 - High quality natural community
High quality examples of natural communities include a large portion of the species typical of the community (see the community descriptions section). Few weedy plants are present. (Weedy species can be native or non-native and are typical of disturbed areas. In forests weedy species include boxelder, buckthorn, prickly ash, and garlic mustard; in prairies they include red cedar, sumac, brome grass, and Kentucky blue-grass.) Most natural processes are occurring, including disturbances such as fire or flooding, if appropriate. There is little or no evidence of human disturbances, such as logging or livestock grazing.

332 - Medium quality natural community
Medium quality examples of natural communities lack many of the species typical of the community. Weedy species may be abundant, but they are not

dominant over the typical native species. (In communities with multiple layers of vegetation, weedy species are not dominant in any layer.) Natural processes may have changed and there may be evidence of human disturbance, but the nature of the community has not been altered beyond recognition.

333 - Low Quality
In low quality examples of natural communities weedy species are dominant in any or all layers of vegetation. Natural processes are highly altered and there are extensive human disturbances. The community may not resemble any naturally-occurring community (i.e. one described by DNR Natural Heritage or NVCS).

340 - Native species present in a non-native dominated polygon.

34X - Modifiers for natural community quality ranking.
The natural plant community sites can be given a natural quality ranking, based on the DNR's Natural Heritage's Element Occurrence Ranking Guidelines* (EOR). See "Natural Community Modifiers" for a discussion of the Element Occurrence Ranking Guidelines.
Refer to the EOR Guidelines to evaluate the specific natural communities. Non-native, altered and disturbed communities should only be given a non-native ranking (NN or NA). Valid codes and general definitions modifier m_34X are:

A = highest quality natural community, no disturbances and natural processes intact. Site must be visited entirely or partially to accurately assess its natural quality at this level (fld_level = 3 or 4).

B = good quality natural community. Has its natural processes intact, but shows signs of past human impacts. Low levels of exotics. Site must be visited entirely or partially to accurately assess its natural quality at this level (fld_level = 3 or 4).

C = moderate condition natural community with obvious past disturbance but is still clearly recognizable as a native community. Not dominated by weedy species in any layer. Minimally, the site must be visited from the edge to accurately assess its natural quality at this level (fld_level = 2, 3 or 4).

D = poor condition of a natural community. Includes some natives, but is dominated by non-natives and/or is widely disturbed and altered. Herbaceous communities may be assessed with this ranking from a distance (fld_level = 1) if large masses of invasive species are present and the entire community is visible.

NA = Native species present in an altered / non-native plant community. This NA ranking can only be used if the site is field checked from the edge or to a greater degree (fld_level 2, 3, or 4), thus confirming the presence of native species within a non-native community.

* http://files.dnr.state.mn.us/ecological_services/nhnrp/eoranks2001.pdfp/eoranks2001.pdf

NN = Altered / non-native plant community. These semi-natural communities do not qualify for natural quality ranking. Using NN signifies the site has been field checked and confirms it is a semi-natural community.

4XX Modifiers that reflect invasive species or vegetative encroachment.
These are to be used to identify non-native plants observed in significant numbers for all natural or semi-natural areas. The polygon attribute table allows for selecting all species that apply. The amount of invasive species present can be tracked using the following codes in its corresponding polygon attribute field:
0 = unknown, or if field checked, plants not observed
1 = observed, unknown quantity
2 = 1 to 5% coverage
3 = 6 to 25% coverage
4 = 26 to 50% coverage
5 = 51 to 75% coverage
6 = 76 to 100% coverage

400 - Overgrown prairie/savanna
401 - Overgrown woodland
402 - Purple loosestrife
403 - Eurasian watermilfoil
404 - Curly-leaf pondweed
405 - Flowering rush
406 - Narrow-leaf cattail
407 - Crown vetch
408 – Common and glossy buckthorn
409 - Leafy spurge
410 - Tartarian honey suckle
411 - Garlic mustard
412 - Reed canary grass
413 - Smooth brome
414 - Spotted knapweed
415 - Exotic thistle
416 - Siberian elm
417 - Phragmites
418 - Grecian foxglove
419 - Amur maple
420 - Black locust
421 - Absinthe sage (*Artemisia absinthium*)
499 - Other

5XX Tree Species
500 - Coniferous trees
501 - Pines
502 - White Pine

503 - Red Pine
504 - Scotch Pine
505 - Ponderosa Pine
506 - Jack Pine
507 - Spruces
508 - White Spruce
509 - Black Spruce
510 - Norway Spruce
511 - Colorado Spruce
512 - Cedars
513 - White Cedar
514 - Red cedar
515 - Tamarack
516 - Pine / Spruce mix
517 - White Pine / Red cedar mix
518 - Deciduous Trees
519 - Planted Maples
520 - Sugar Maple
521 - Norway Maple
522 - Silver Maple
523 - Boxelder
524 - Oaks
525 - White Oak
526 - Red Oak
527 - Burr Oak
528 - Swamp White Oak
529 - Northern Pin Oak
530 - Ashes
531 - Green Ash
532 - White Ash
533 - Poplars
534 - Cottonwood
535 - Aspen
536 - Bigtooth Aspen
537 - Maple / Oak mix
538 - Maple / Ash mix
539 - Northern Hardwoods
540 - Mixed early successional hardwoods
541 - Mixed Coniferous - Deciduous Trees
542 - White Pine / Sugar Maple
543 - Pine / Spruce / Oak / Maple
544 - Pine / Oak
545 - Walnut
546 - Willow

6XX Forestry modifiers

60X - Forest Dynamics.

The following terminology was developed by John Kotar at the University of Wisconsin-Madison through a cooperative agreement with the USDA Forest Service, Northeastern Area State and Private Forestry.

601 - Stand initiation.

This follows major disturbances, such as catastrophic wind, fire or clear cutting. The open space becomes filled with individuals that arrive by seed (e.g., paper birch, yellow poplar, aspen, cherry), stump sprouts (e.g., oak after fire) and root sprouts (e.g., aspen after clear cutting), or that were present as advance regeneration (e.g., sugar maple or other shade-tolerant species after a tornado or logging removes the canopy). This stage ends when the canopy becomes continuous and trees begin competing with each other for light and canopy space.

602 - Stem exclusion.

During this stage, the canopy is dense enough to prevent new saplings from growing into the canopy - there is no space available for new canopy trees. The canopy continues to have only one dominant cohort, with a relatively smooth upper canopy surface. Competition among trees is intense and density-dependent self-thinning is the major cause of mortality. Crowns are small enough so that when one tree dies, the other trees are able to fill the vacated space in the canopy by expanding their crowns. The duration of this stage varies with species and geographic region. For example, in the Lake States and the Northeast, this situation continues for 75-150 years in northern hardwoods and red or white pine stands, but may last only 20 to 40 years in some aspen and jack pine stands.

603 - Understory reinitiation

At this point, a stand undergoes demographic transition from one cohort to more than one cohort. There may be a wave of high mortality as many trees reach old age at the same time. The crowns of the trees are now large enough so that when one dies, the surrounding trees cannot fill the gap. As a result, a new cohort of trees has space to enter the canopy. The diameter distribution becomes a compound of the two cohorts - an old unimodal peak in larger size classes and a new peak in the small size classes. If the stand was originally composed of a pioneer species (e.g., paper birch, aspen or yellow poplar), shade-tolerant trees such as sugar maple or beech may begin entering the canopy. If there are more gaps in the canopy and more light on the forest floor, some of the mid-tolerant trees, such as white ash, red maple, yellow birch and white pine, also may enter the canopy. Mortality undergoes a transition from mostly density-dependent self-thinning to mostly density independent mechanisms, such as senescence, windthrow (due to weakened wood caused by heartrot) or disease. The stand begins to take on "old growth" characteristics, with large rotten logs on the forest floor, many tree sizes and an uneven canopy surface.

604 - Old, multi-aged community
At this point, demographic transition is complete; the forest has many age classes and size classes of trees in the canopy. There may be few or no remnants left from the original cohort. Mortality is continuous at a relatively low level, with death occurring mainly in individuals or small groups of trees.

61X Percent tree canopy cover
- 610 - No tree cover
- 611 - 1% to 10% tree cover
- 612 - 11% to 20% tree cover
- 613 - 21% to 40% tree cover
- 614 - 41% to 60% tree cover
- 615 - 61% to 80% tree cover
- 616 - 81% to 100% tree cover

62X Cover size. Average diameter of trees
- 621 - not applicable to stand
- 622 - 0 to 0.9' Diameter Breast Height (DBH)
- 623 - 1 to 2.9' DBH
- 624 - 3 to 4.9' DBH
- 625 - 5 to 8.9' DBH
- 626 - 9 to 14.9' DBH
- 627 - 15 to 19.9' DBH
- 628 - 20 to 24.9' DBH
- 629 - 25+= DBH

7XX Water modifiers

71X - Water regime (NWI modifiers)
- 710 - Temporarily Flooded (A)
- 711 - Saturated (B)
- 712 - Seasonally Flooded (C)
- 713 - Semipermanently Flooded (F)
- 714 - Intermittently Exposed (G)
- 715 - Permanently Flooded (H)
- 716 - Artificially Flooded (K)

72X - Built features
- 720 - Beaver Pond (b)
- 721 - Partially Drained/Ditched (d)
- 722 - Farmed (f)
- 723 - Diked/Impounded (h)
- 724 - Artificial Substrate (r)
- 725 - Spoil (s)
- 726 - Excavated (x)

73X - Wetland features
- 730 - wetland(s) present
- 731 - water feature used for stormwater management
- 732 - water feature used for wildlife management
- 733 - reservoir
- 734 - livestock watering hole

74X - Stream features
- 740 - stream(s) present
- 741 - ditch present

75X - Spring feature
- 750 - groundwater seepage/springs present

Tables of MLCCS Codes

An integral part of the MLCCS is the use of modifier codes. Modifier codes are to be used to further define a site and are considered equal in weight to the initial MLCCS code. In cases where a site has been field checked, appropriate modifiers should be applied. See page B-26 for the modifier codes.

NOTE: The NVCS Evergreen classification has been changed to coniferous, thus moving tamarack forests from the NVCS deciduous classification to a coniferous classification

Artificial surfaces and associated areas

C_NUM	DESCRIPTION	C_ALPHA
10000	Artificial surfaces and associated areas	1.
11000	Artificial surfaces with trees as the dominant vegetation cover (25% to 96% vegetation cover)	1.tt.
11100	Artificial surfaces with coniferous trees	1.tt.CC.
11110	4% to 10% impervious cover with coniferous trees	1.tt.CC.i10.
11111	Jack pine (forest or woodland) with 4-10% impervious cover	1.tt.CC.i10.cJP.
11112	White/red pine (forest) with 4-10% impervious cover	1.tt.CC.i10.cWF.
11113	Spruce-fir (forest) with 4-10% impervious cover	1.tt.CC.i10.cSF.
11114	Eastern red cedar (woodland) with 4-10% impervious cover	1.tt.CC.i10.cRC.
11115	Northern conifer (woodland) with 4-10% impervious cover	1.tt.CC.i10.cNW.
11116	Planted red pine with 4-10% impervious cover	1.tt.CC.i10.cPR.
11117	Planted white pine with 4-10% impervious cover	1.tt.CC.i10.cPW.
11118	Planted spruce/fir with 4-10% impervious cover	1.tt.CC.i10.cPS.
11119	Other planted conifers with 4-10% impervious cover	1.tt.CC.i10.cPC.
11120	11% to 25% impervious cover with coniferous trees	1.tt.CC.i25.
11121	Jack pine (forest or woodland) with 11- 25% impervious cover	1.tt.CC.i25.cJP.
11122	White/red pine (forest) with 11- 25% impervious cover	1.tt.CC.i25.cWF.
11123	Spruce-fir (forest) with 11- 25% impervious cover	1.tt.CC.i25.cSF.
11124	Eastern red cedar (woodland) with 11- 25% impervious cover	1.tt.CC.i25.cRC.
11125	Northern conifer (woodland) with 11- 25% impervious cover	1.tt.CC.i25.cNW.
11126	Planted red pine with 11- 25% impervious cover	1.tt.CC.i25.cPR.
11127	Planted white pine with 11- 25% impervious cover	1.tt.CC.i25.cPW.
11128	Planted spruce/fir with 11- 25% impervious cover	1.tt.CC.i25.cPS.
11129	Other planted conifers with 11- 25% impervious cover	1.tt.CC.i25.cPC.
11130	26% to 50% impervious cover with coniferous trees	1.tt.CC.i50.
11131	Jack pine (forest or woodland) with 26-50% impervious cover	1.tt.CC.i50.cJP.
11132	White/red pine (forest) with 26-50% impervious cover	1.tt.CC.i50.cWF.
11133	Spruce-fir (forest) with 26-50% impervious cover	1.tt.CC.i50.cSF.

11134	Eastern red cedar (woodland) with 26-50% impervious cover	1.tt.CC.i50.cRC.
11135	Northern conifer (woodland) with 26-50% impervious cover	1.tt.CC.i50.cNW.
11136	Planted red pine with 26-50% impervious cover	1.tt.CC.i50.cPR.
11137	Planted white pine with 26-50% impervious cover	1.tt.CC.i50.cPW.
11138	Planted spruce/fir with 26-50% impervious cover	1.tt.CC.i50.cPS.
11139	Other planted conifers with 26-50% impervious cover	1.tt.CC.i50.cPC.
11140	51% to 75% impervious cover with coniferous trees	1.tt.CC.i75.
11141	Jack pine (forest or woodland) with 51-75% impervious cover	1.tt.CC.i75.cJP.
11142	White/red pine (forest) with 51-75% impervious cover	1.tt.CC.i75.cWF.
11143	Spruce-fir (forest) with 51-75% impervious cover	1.tt.CC.i75.cSF.
11144	Eastern red cedar (woodland) with 51-75% impervious cover	1.tt.CC.i75.cRC.
11145	Northern conifer (woodland) with 51-75% impervious cover	1.tt.CC.i75.cNW.
11146	Planted red pine with 51-75% impervious cover	1.tt.CC.i75.cPR.
11147	Planted white pine with 51-75% impervious cover	1.tt.CC.i75.cPW.
11148	Planted spruce/fir with 51-75% impervious cover	1.tt.CC.i75.cPS.
11149	Other planted conifers with 51-75% impervious cover	1.tt.CC.i75.cPC.
11200	Artificial surfaces with deciduous tree cover	1.tt.CD.
11210	4% to 10% impervious cover with deciduous trees	1.tt.CD.i10.
11211	Oak (forest or woodland) with 4-10% impervious cover	1.tt.CD.i10.cOA.
11212	Northern hardwood (forest) with 4-10% impervious cover	1.tt.CD.i10.cNH.
11213	Maple-basswood (forest) with 4-10% impervious cover	1.tt.CD.i10.cMB.
11214	Boxelder-green ash (forest) with 4-10% impervious cover	1.tt.CD.i10.cBG.
11215	Aspen-birch (forest) with 4-10% impervious cover	1.tt.CD.i10.cAB.
11216	Aspen (forest, woodland) with 4-10% impervious cover	1.tt.CD.i10.cAF.
11217	Planted ash with 4-10% impervious cover	1.tt.CD.i10.cPA.
11218	Planted oak with 4-10% impervious cover	1.tt.CD.i10.cPO.
11219	Other deciduous trees with 4-10% impervious cover	1.tt.CD.i10.cPD.
11220	11% to 25% impervious cover with deciduous trees	1.tt.CD.i25.
11221	Oak (forest or woodland) with 11- 25% impervious cover	1.tt.CD.i25.cOA.
11222	Northern hardwood (forest) with 11- 25% impervious cover	1.tt.CD.i25.cNH.
11223	Maple-basswood (forest) with 11- 25% impervious cover	1.tt.CD.i25.cMB.
11224	Boxelder-green ash (forest) with 11- 25% impervious cover	1.tt.CD.i25.cBG.
11225	Aspen-birch (forest) with 11- 25% impervious cover	1.tt.CD.i25.cAB.
11226	Aspen (forest, woodland) with 11- 25% impervious cover	1.tt.CD.i25.cAF.
11227	Planted ash with 11- 25% impervious cover	1.tt.CD.i25.cPA.
11228	Planted oak with 11- 25% impervious cover	1.tt.CD.i25.cPO.
11229	Other deciduous trees with 11- 25% impervious cover	1.tt.CD.i25.cPD.
11230	26% to 50% impervious cover with deciduous trees	1.tt.CD.i50.
11231	Oak (forest or woodland) with 26-50% impervious cover	1.tt.CD.i50.cOA.
11232	Northern hardwood (forest) with 26-50% impervious cover	1.tt.CD.i50.cNH.
11233	Maple-basswood (forest) with 26-50% impervious cover	1.tt.CD.i50.cMB.
11234	Boxelder-green ash (forest) with 26-50% impervious cover	1.tt.CD.i50.cBG.
11235	Aspen-birch (forest) with 26-50% impervious cover	1.tt.CD.i50.cAB.
11236	Aspen (forest, woodland) with 26-50% impervious cover	1.tt.CD.i50.cAF.
11237	Planted ash with 26-50% impervious cover	1.tt.CD.i50.cPA.
11238	Planted oak with 26-50% impervious cover	1.tt.CD.i50.cPO.

11239	Other deciduous trees with 26-50% impervious cover	1.tt.CD.i50.cPD.
11240	51% to 75% impervious cover with deciduous trees	1.tt.CD.i75.
11241	Oak (forest or woodland) with 51-75% impervious cover	1.tt.CD.i75.cOA.
11242	Northern hardwood (forest) with 51-75% impervious cover	1.tt.CD.i75.cNH.
11243	Maple-basswood (forest) with 51-75% impervious cover	1.tt.CD.i75.cMB.
11244	Boxelder-green ash (forest) with 51-75% impervious cover	1.tt.CD.i75.cBG.
11245	Aspen-birch (forest) with 51-75% impervious cover	1.tt.CD.i75.cAB.
11246	Aspen (forest, woodland) with 51-75% impervious cover	1.tt.CD.i75.cAF.
11247	Planted ash with 51-75% impervious cover	1.tt.CD.i75.cPA.
11248	Planted oak with 51-75% impervious cover	1.tt.CD.i75.cPO.
11249	Other deciduous trees with 51-75% impervious cover	1.tt.CD.i75.cPD.
11300	Artificial surfaces with mixed coniferous and deciduous tree cover	1.tt.CM.
11310	4% to 10% impervious cover with mixed coniferous/deciduous trees	1.tt.CM.i10.
11311	Mixed pine-hardwood (forest) with 4-10% impervious cover	1.tt.CM.i10.cMF.
11312	White pine-hardwood (forest) with 4-10% impervious cover	1.tt.CM.i10.cWH.
11313	Northern hardwood-conifer (forest) with 4-10% impervious cover	1.tt.CM.i10.cNF.
11314	Planted mixed coniferous/deciduous trees with 4-10% impervious cover	1.tt.CM.i10.cPM.
11320	11% to 25% impervious cover with mixed coniferous/deciduous trees	1.tt.CM.i25.
11321	Mixed pine-hardwood (forest) with 11-25% impervious cover	1.tt.CM.i25.cMF.
11322	White pine-hardwood (forest) with 11-25% impervious cover	1.tt.CM.i25.cWH.
11323	Northern hardwood-conifer (forest) with 11-25% impervious cover	1.tt.CM.i25.cNF.
11324	Planted mixed coniferous/deciduous trees with 11-25% impervious cover	1.tt.CM.i25.cPM.
11330	26% to 50% impervious cover with mixed coniferous/deciduous trees	1.tt.CM.i50.
11331	Mixed pine-hardwood (forest) with 26-50% impervious cover	1.tt.CM.i50.cMF.
11332	White pine-hardwood (forest) with 26-50% impervious cover	1.tt.CM.i50.cWH.
11333	Northern hardwood-conifer (forest) with 26-50% impervious cover	1.tt.CM.i50.cNF.
11334	Planted mixed coniferous/deciduous trees with 26-50% impervious cover	1.tt.CM.i50.cPM.
11340	51% to 75% impervious cover with mixed coniferous/deciduous trees	1.tt.CM.i75.
11341	Mixed pine-hardwood (forest) with 51-75% impervious cover	1.tt.CM.i75.cMF.
11342	White pine-hardwood (forest) with 51-75% impervious cover	1.tt.CM.i75.cWH.
11343	Northern hardwood-conifer (forest) with 51-75% impervious cover	1.tt.CM.i75.cNF.
11344	Planted mixed coniferous/deciduous trees with 51-75% impervious cover	1.tt.CM.i75.cPM.
12000	Artificial surfaces with coniferous and/or deciduous shrub dominant vegetation (25% to 96% vegetation cover)	1.ss.
12100	Artificial surfaces with coniferous and/or deciduous shrubs	1.ss.CS.
12110	4% to 10% impervious cover with coniferous and/or deciduous shrubs	1.ss.CS.i10.
12111	Short grasses with planted coniferous and/or deciduous shrubs, 4-10% impervious cover	1.ss.CS.i10.cGS.
12112	Long grasses with planted coniferous and/or deciduous shrubs, 4-10% impervious cover	1.ss.CS.i10.cGL.
12113	Other coniferous and/or deciduous shrubs with 4-10% impervious cover	1.ss.CS.i10.cOB.
12120	11% to 25% impervious cover with coniferous and/or deciduous shrubs	1.ss.CS.i25.
12121	Short grasses with planted coniferous and/or deciduous shrubs, 11-	1.ss.CS.i25.cGS.

	25% impervious cover	
12122	Long grasses with planted coniferous and/or deciduous shrubs, 11-25% impervious cover	1.ss.CS.i25.cGL.
12123	Other coniferous and/or deciduous shrubs, 11-25% impervious cover	1.ss.CS.i25.cOB.
12130	26% to 50% impervious cover with coniferous and/or deciduous shrubs	1.ss.CS.i50.
12131	Short grasses with planted coniferous and/or deciduous shrubs, 26-50% impervious cover	1.ss.CS.i50.cGS.
12132	Long grasses with planted coniferous and/or deciduous shrubs, 26-50% impervious cover	1.ss.CS.i50.cGL.
12133	Other coniferous and/or deciduous shrubs, 26-50% impervious cover	1.ss.CS.i50.cOB.
12140	51% to 75% impervious cover with coniferous and/or deciduous shrubs	1.ss.CS.i75.
12141	Short grasses with planted coniferous and/or deciduous shrubs, 51-75% impervious cover	1.ss.CS.i75.cGS.
12142	Long grasses with planted coniferous and/or deciduous shrubs, 51-75% impervious cover	1.ss.CS.i75.cGL.
12143	Other coniferous and/or deciduous shrubs, 51-75% impervious cover	1.ss.CS.i75.cOB.
12200	Artificial surfaces with coniferous and/or deciduous shrubs with sparse trees	1.ss.CE.
12210	4% to 10% impervious cover with coniferous and/or deciduous shrubs and sparse trees	1.ss.CE.i10.
12211	Oak woodland brushland with 4-10% impervious cover	1.ss.CE.i10.cOW.
12212	Other coniferous and/or deciduous shrubs and trees with 4-10% impervious cover	1.ss.CE.i10.cOR.
12220	11% to 25% impervious cover with coniferous and/or deciduous shrubs and sparse trees	1.ss.CE.i25.
12221	Oak woodland brushland with11-25% impervious cover	1.ss.CE.i25.cOW.
12222	Other coniferous and/or deciduous shrubs and trees with11-25% impervious cover	1.ss.CE.i25.cOR.
12230	26% to 50% impervious cover with coniferous and/or deciduous shrubs and sparse trees	1.ss.CE.i50.
12231	Oak woodland brushland with 26-50% impervious cover	1.ss.CE.i50.cOW.
12232	Other coniferous and/or deciduous shrubs and trees with 26-50% impervious cover	1.ss.CE.i50.cOR.
12240	51% to 75% impervious cover with coniferous and/or deciduous shrubs and sparse trees	1.ss.CE.i75.
12241	Oak Woodland brushland with 51-75% impervious cover	1.ss.CE.i75.cOW.
12242	Other coniferous and/or deciduous shrubs and trees with 51-75% impervious cover	1.ss.CE.i75.cOR.
13000	Artificial surfaces with herbaceous dominant vegetation (25% to 96% vegetation cover)	1.hh.
13100	Artificial surfaces with perennial grasses with sparse trees	1.hh.CT.
13110	4% to 10% impervious cover with perennial grasses and sparse trees	1.hh.CT.i10.
13111	Jack pine barrens with 4-10% impervious cover	1.hh.CT.i10.cJB.
13112	Oak savanna with 4-10% impervious cover	1.hh.CT.i10.cOS.
13113	Aspen openings with 4-10% impervious cover	1.hh.CT.i10.cAO.
13114	Short grasses and mixed trees with 4-10% impervious cover	1.hh.CT.i10.cGS.
13115	Long grasses and mixed trees with 4-10% impervious cover	1.hh.CT.i10.cGL.
13120	11% to 25% impervious cover with perennial grasses and sparse trees	1.hh.CT.i25.
13121	Jack pine barrens with 11-25% impervious cover	1.hh.CT.i25.cJB.
13122	Oak savanna with 11-25% impervious cover	1.hh.CT.i25.cOS.

13123	Aspen openings with 11-25% impervious cover	1.hh.CT.i25.cAO.
13124	Short grasses and mixed trees with 11-25% impervious cover	1.hh.CT.i25.cGS.
13125	Long grasses and mixed trees with 11-25% impervious cover	1.hh.CT.i25.cGL.
13130	26% to 50% impervious cover with perennial grasses and sparse trees	1.hh.CT.i50.
13131	Jack pine barrens with 26-50% impervious cover	1.hh.CT.i50.cJB.
13132	Oak savanna with 26-50% impervious cover	1.hh.CT.i50.cOS.
13133	Aspen openings with 26-50% impervious cover	1.hh.CT.i50.cAO.
13134	Short grasses and mixed trees with 26-50% impervious cover	1.hh.CT.i50.cGS.
13135	Long grasses and mixed trees with 26-50% impervious cover	1.hh.CT.i50.cGL.
13140	51% to 75% impervious cover with perennial grasses and sparse trees	1.hh.CT.i75.
13141	Jack pine barrens with 51-75% impervious cover	1.hh.CT.i75.cJB.
13142	Oak savanna with 51-75% impervious cover	1.hh.CT.i75.cOS.
13143	Aspen openings with 51-75% impervious cover	1.hh.CT.i75.cAO.
13144	Short grasses and mixed trees with 51-75% impervious cover	1.hh.CT.i75.cGS.
13145	Long grasses and mixed trees with 51-75% impervious cover	1.hh.CT.i75.cGL.
13200	Artificial surfaces with perennial grasses	1.hh.CG.
13210	4% to 10% impervious cover with perennial grasses	1.hh.CG.i10.
13211	Short grasses with 4-10% impervious cover	1.hh.CG.i10.cGS.
13212	Non-native dominated long grasses with 4-10% impervious cover	1.hh.CG.i10.cGL.
13213	Mesic prairie with 4-10% impervious cover	1.hh.CG.i10.cMP.
13214	Dry prairie with 4-10% impervious cover	1.hh.CG.i10.cDP.
13220	11% to 25% impervious cover with perennial grasses	1.hh.CG.i25.
13221	Short grasses with 11-25% impervious cover	1.hh.CG.i25.cGS.
13222	Non-native dominated long grasses with 11-25% impervious cover	1.hh.CG.i25.cGL.
13223	Mesic prairie with 11-25% impervious cover	1.hh.CG.i25.cMP.
13224	Dry prairie with 11-25% impervious cover	1.hh.CG.i25.cDP.
13230	26% to 50% impervious cover with perennial grasses	1.hh.CG.i50.
13231	Short grasses with 26-50% impervious cover	1.hh.CG.i50.cGS.
13232	Non-native dominated long grasses with 26-50% impervious cover	1.hh.CG.i50.cGL.
13233	Mesic prairie with 26-50% impervious cover	1.hh.CG.i50.cMP.
13234	Dry prairie with 26-50% impervious cover	1.hh.CG.i50.cDP.
13240	51% to 75% impervious cover with perennial grasses	1.hh.CG.i75.
13241	Short grasses with 51-75% impervious cover	1.hh.CG.i75.cGS.
13242	Non-native dominated long grasses with 51-75% impervious cover	1.hh.CG.i75.cGL.
13243	Mesic prairie with 51-75% impervious cover	1.hh.CG.i75.cMP.
13244	Dry prairie with 51-75% impervious cover	1.hh.CG.i75.cDP.
13300	Artificial surfaces with cultivated herbaceous vegetation (Gardens)	1.hh.CN.
13310	4% to 10% impervious cover with cultivated herbaceous vegetation	1.hh.CN.i10.
13311	Vegetables with 4-10% impervious cover	1.hh.CN.i10.cVG.
13312	Forbs (flowers) with 4-10% impervious cover	1.hh.CN.i10.cFB.
13320	11% to 25% impervious cover with cultivated herbaceous vegetation	1.hh.CN.i25.
13321	Vegetables with 11-25% impervious cover	1.hh.CN.i25.cVG.
13322	Forbs (flowers) with 11-25% impervious cover	1.hh.CN.i25.cFB.
13330	26% to 50% impervious cover with cultivated herbaceous vegetation	1.hh.CN.i50.
13331	Vegetables with 26-50% impervious cover	1.hh.CN.i50.cVG.
13332	Forbs (flowers) with 26-50% impervious cover	1.hh.CN.i50.cFB.

13340	51% to 75% impervious cover with cultivated herbaceous vegetation	1.hh.CN.i75.
13341	Vegetables with 51-75% impervious cover	1.hh.CN.i75.cVG.
13342	Forbs (flowers)with 51-75% impervious cover	1.hh.CN.i75.cFB.
14000	Artificial surfaces with less than 25% vegetation cover	1.mv.
14100	Buildings and/or pavement	1.mv.BP.
14110	76% to 90% impervious cover	1.mv.BP.i90.
14111	Buildings with 76-90% impervious cover	1.mv.BP.i90.cBD.
14112	Pavement with 76-90% impervious cover	1.mv.BP.i90.cPV.
14113	Buildings and pavement with 76-90% impervious cover	1.mv.BP.i90.cBP.
14120	91% to 100% impervious cover	1.mv.BP.i99.
14121	Buildings with 91-100% impervious cover	1.mv.BP.i99.cBD.
14122	Pavement with 91-100% impervious cover	1.mv.BP.i99.cPV.
14123	Buildings and pavement with 91-100% impervious cover	1.mv.BP.i99.cBP.
14200	Exposed earth	1.mv.EE.
14210	0% to 10% impervious cover-exposed earth	1.mv.EE.e10.
14211	Mines with 0-10% impervious cover	1.mv.EE.e10.cMN.
14212	Sand and gravel pits with 0-10% impervious cover	1.mv.EE.e10.cSG.
14213	Landfill with 0-10% impervious cover	1.mv.EE.e10.cLF.
14214	Other exposed/transitional land with 0-10% impervious cover	1.mv.EE.e10.cOE.
14220	11% to 25% impervious cover-exposed earth	1.mv.EE.e25.
14221	Mines with 11-25% impervious cover	1.mv.EE.e25.cMN.
14222	Sand and gravel pits with 11-25% impervious cover	1.mv.EE.e25.cSG.
14223	Landfill with 11-25% impervious cover	1.mv.EE.e25.cLF.
14224	Other exposed/transitional land with 11-25% impervious cover	1.mv.EE.e25.cOE.
14230	26% to 50% impervious cover-exposed earth	1.mv.EE.e50.
14231	Mines with 26-50% impervious cover	1.mv.EE.e50.cMN.
14232	Sand and gravel pits with 26-50% impervious cover	1.mv.EE.e50.cSG.
14233	Landfill with 26-50% impervious cover	1.mv.EE.e50.cLF.
14234	Other exposed/transitional land with 26-50% impervious cover.	1.mv.EE.e50.cOE.

Planted or Cultivated Vegetation

20000	Planted or Cultivated Vegetation (greater than 96% vegetation cover)	2.
21000	Planted, maintained or cultivated tree vegetation	2.tt.
21100	Planted, maintained or cultivated coniferous trees	2.tt.CC.
21110	Upland soils with planted, maintained, or cultivated coniferous trees	2.tt.CC.pUS.
21111	Spruce/fir trees on upland soils	2.tt.CC.pUS.cPS.
21112	White pine trees on upland soils	2.tt.CC.pUS.cPW.
21113	Red pine trees on upland soils	2.tt.CC.pUS.cPR.
21114	Coniferous trees on upland soils	2.tt.CC.pUS.cPC.
21200	Planted, maintained or cultivated deciduous trees	2.tt.CD.
21210	Upland soils with planted, maintained or cultivated deciduous trees	2.tt.CD.pUS.
21211	Fruit trees (apple, cherry, plum, etc) on upland soils	2.tt.CD.pUS.cPF.
21212	Walnut trees on upland soils	2.tt.CD.pUS.cPT.
21213	Deciduous trees on upland soils	2.tt.CD.pUS.cPD.
21300	Planted, maintained or cultivated mixed coniferous and deciduous trees	2.tt.CM.
21310	Upland soils with planted, maintained or cultivated mixed coniferous/deciduous trees	2.tt.CM.pUS.
21320	Hydric soils with planted, maintained or cultivated mixed coniferous/deciduous trees	2.tt.CM.pHS.
22000	Planted, maintained or cultivated shrub and/or vine vegetation	2.sv.
22100	Planted, maintained or cultivated coniferous shrubs	2.sv.CB.
22110	Upland soils with planted, maintained or cultivated coniferous shrubs	2.sv.CB.pUS.
22120	Hydric soils with planted, maintained or cultivated coniferous shrubs	2.sv.CB.pHS.
22200	Planted, maintained or cultivated deciduous shrub/vine vegetation	2.sv.CO.
22210	Upland soils with planted, maintained or cultivated deciduous shrub/vine vegetation	2.sv.CO.pUS.
22211	Blackberry	2.sv.CO.pUS.cBB.
22212	Blueberry	2.sv.CO.pUS.cBL.
22213	Grape	2.sv.CO.pUS.cGP.
22214	Raspberry-black	2.sv.CO.pUS.cRB.
22215	Raspberry-red	2.sv.CO.pUS.cRR.
22216	Other shrub/vine vegetation	2.sv.CO.pUS.cOX.
22220	Artificially flooded or saturated soils	2.sv.CO.pFL.
22221	Cranberry	2.sv.CO.pFL.cCB.
22300	Planted, maintained or cultivated mixed coniferous-deciduous shrub/vine vegetation	2.sv.CS.
22310	Upland soils with planted, maintained or cultivated mixed coniferous-deciduous shrub/vine	2.sv.CS.pUS.
22320	Hydric soils with planted, maintained or cultivated mixed coniferous-deciduous shrub/vine	2.sv.CS.pHS.
23000	Planted or maintained herbaceous vegetation	2.ph.
23100	Planted or maintained grasses with sparse tree cover	2.ph.CT.
23110	Upland soils with planted or maintained grasses and sparse tree cover	2.ph.CT.pUS.
23111	Short grasses with sparse tree cover on upland soils	2.ph.CT.pUS.cGS.
23112	Long grasses with sparse tree cover on upland soils	2.ph.CT.pUS.cGL.

23120	Hydric soils with planted or maintained grasses and sparse tree cover	2.ph.CT.pHS.
23121	Short grasses with sparse tree cover on hydric soils	2.ph.CT.pHS.cGS.
23122	Long grasses with sparse tree cover on hydric soils	2.ph.CT.pHS.cGL.
23200	Planted or maintained grasses	2.ph.CG.
23210	Upland soils with planted or maintained grasses	2.ph.CG.pUS.
23211	Short grasses on upland soils	2.ph.CG.pUS.cGS.
23212	Long grasses on upland soils	2.ph.CG.pUS.cGL.
23220	Hydric soils with planted or maintained grasses	2.ph.CG.pHS.
23221	Short grasses on hydric soils	2.ph.CG.pHS.cGS.
23222	Long grasses on hydric soils	2.ph.CG.pHS.cGL.
23300	Planted or maintained grasses and forbs	2.ph.CF.
23310	Upland soils with planted or maintained grasses and forbs	2.ph.CF.pUS.
23311	Short grasses and forbs on upland soils	2.ph.CF.pUS.cGS.
23312	Long grasses and forbs on upland soils	2.ph.CF.pUS.cGL.
23320	Hydric soils with planted grasses and forbs	2.ph.CF.pHS.
23321	Short grasses and forbs on hydric soils	2.ph.CF.pHS.cGS.
23322	Long grasses and forbs on hydric soils	2.ph.CF.pHS.cGL.
24000	Cultivated herbaceous vegetation	2.ch.
24100	Row cropland	2.ch.RC.
24110	Upland soils - cropland	2.ch.RC.pUS.
24111	Beans (all types except soybeans)	2.ch.RC.pUS.cBN.
24112	Corn	2.ch.RC.pUS.cCO.
24113	Sorghum	2.ch.RC.pUS.cSG.
24114	Soybeans	2.ch.RC.pUS.cSB.
24115	Sugar beets	2.ch.RC.pUS.cST.
24116	Potato	2.ch.RC.pUS.cPP.
24117	Pumpkins	2.ch.RC.pUS.cPK.
24118	Sunflowers	2.ch.RC.pUS.cSF.
24119	Other vegetable and truck crops	2.ch.RC.pUS.cOV.
24120	Hydric soils - row cropland	2.ch.RC.pHS.
24121	Beans (all types except soybeans) on hydric soils	2.ch.RC.pHS.cBN.
24122	Corn on hydric soils	2.ch.RC.pHS.cCO.
24123	Sorghum on hydric soils	2.ch.RC.pHS.cSG.
24124	Soybeans on hydric soils	2.ch.RC.pHS.cSB.
24125	Sugar beets on hydric soils	2.ch.RC.pHS.cST.
24126	Potato on hydric soils	2.ch.RC.pHS.cPP.
24127	Pumpkins on hydric soils	2.ch.RC.pHS.cPK.
24128	Sunflowers on hydric soils	2.ch.RC.pHS.cSF.
24129	Other vegetable and truck crops on hydric soils	2.ch.RC.pHS.cOV.
24200	Close grown or solid seeded cropland	2.ch.GN.
24210	Upland soils - close grown cropland	2.ch.GN.pUS.
24211	Wheat	2.ch.GN.pUS.cWT.
24212	Oats	2.ch.GN.pUS.cOT.
24213	Barley	2.ch.GN.pUS.cBA.
24214	Sod	2.ch.GN.pUS.cSD.
24215	Not planted	2.ch.GN.pUS.cNP.

24216	Fallow	2.ch.GN.pUS.cFW.
24217	Hayfield	2.ch.GN.pUS.cHF.
24218	All other close grown cropland on upland soils	2.ch.GN.pUS.cOC.
24220	Hydric soils - close grown cropland	2.ch.GN.pHS.
24221	Wheat on hydric soils	2.ch.GN.pHS.cWT.
24222	Oats on hydric soils	2.ch.GN.pHS.cOT.
24223	Rice on hydric soils	2.ch.GN.pHS.cRI.
24224	Barley on hydric soils	2.ch.GN.pHS.cBA.
24225	Sod on hydric soils	2.ch.GN.pHS.cSD.
24226	Not planted on hydric soils	2.ch.GN.pHS.cNP.
24227	Fallow hydric soils	2.ch.GN.pHS.cFW.
24228	Hayfield on hydric soils	2.ch.GN.pHS.cHF.
24229	All other close grown cropland on hydric soils	2.ch.GN.pHS.cOC.
24230	Artificially flooded or saturated soils - close grown cropland	2.ch.GN.pFL.
24231	Rice	2.ch.GN.pFL.cRI.

Forest

30000	Forests	3.
31000	Coniferous forest	3.ce.
31100	Upland coniferous forest	3.ce.UP.
31110	Black spruce-feathermoss forest	3.ce.UP.nBL.
31120	Jack pine forest	3.ce.UP.nJP.
31121	Jack pine forest jack pine-fir subtype	3.ce.UP.nJP.nJF.
31122	Jack pine forest hazel subtype	3.ce.UP.nJP.nJH.
31123	Jack pine forest jack pine-oak subtype	3.ce.UP.nJP.nJO.
31124	Jack pine forest jack pine-black spruce subtype	3.ce.UP.nJP.nJS.
31125	Jack pine forest blueberry subtype	3.ce.UP.nJP.nJY.
31130	Red pine forest	3.ce.UP.nRP.
31140	White pine forest	3.ce.UP.nWF.
31150	Upland white cedar forest	3.ce.UP.nUW.
31151	Upland white cedar forest wet-mesic subtype	3.ce.UP.nUW.nUE.
31152	Upland white cedar forest mesic subtype	3.ce.UP.nUW.nUM.
31160	Spruce-fir forest	3.ce.UP.nSF.
31161	Spruce-fir forest white spruce-balsam fir subtype	3.ce.UP.nSF.nSB.
31162	Spruce-fir forest fir-birch subtype	3.ce.UP.nSF.nSI.
31200	Saturated coniferous forest	3.ce.WB.
31210	Tamarack swamp	3.ce.WB.nTS.
31211	Tamarack swamp seepage subtype	3.ce.WB.nTS.nTE.
31212	Tamarack swamp minerotrophic subtype	3.ce.WB.nTS.nTM.
31213	Tamarack swamp sphagnum subtype	3.ce.WB.nTS.nTP.
31220	White cedar swamp	3.ce.WB.nWC.
31221	White cedar swamp seepage subtype	3.ce.WB.nWC.nWT.
31230	Black spruce swamp	3.ce.WB.nBS.
31240	Black spruce bog	3.ce.WB.nBB.
31241	Black spruce bog intermediate subtype	3.ce.WB.nBB.nBI.
31242	Black spruce bog raised subtype	3.ce.WB.nBB.nBR.
32000	Deciduous forest	3.de.
32100	Upland deciduous forest	3.de.UP.
32110	Oak forest	3.de.UP.nOA.
32111	Oak forest red maple subtype	3.de.UP.nOA.nOL.
32112	Oak forest mesic subtype	3.de.UP.nOA.nOM.
32113	Oak forest dry subtype	3.de.UP.nOA.nOD.
32120	Northern hardwood forest	3.de.UP.nNH.
32130	Paper birch forest	3.de.UP.nPB.
32131	Paper birch forest northern hardwoods subtype	3.de.UP.nPB.nPN.
32132	Paper birch forest spruce-fir subtype	3.de.UP.nPB.nPS.
32140	Aspen-birch forest	3.de.UP.nAB.
32141	Aspen-birch forest northern hardwoods subtype	3.de.UP.nAB.nAN.
32142	Aspen-birch forest spruce-fir subtype	3.de.UP.nAB.nAU.
32150	Maple-basswood forest	3.de.UP.nMB.

32160	Aspen forest	3.de.UP.nAF.
32170	Altered/non-native deciduous forest	3.de.UP.nAT.
32200	Temporarily flooded deciduous forest	3.de.WA.
32210	Floodplain forest	3.de.WA.nFF.
32211	Floodplain forest silver maple subtype	3.de.WA.nFF.nFM.
32212	Floodplain forest swamp white oak subtype	3.de.WA.nFF.nFO.
32220	Lowland hardwood forest	3.de.WA.nLH.
32230	Aspen forest - temporarily flooded	3.de.WA.nAF.
32240	Altered/non-native temporarily flooded deciduous forest	3.de.WA.nAT.
32300	Saturated deciduous forest	3.de.WB.
32310	Black ash swamp	3.de.WB.nBA.
32311	Black ash swamp seepage subtype	3.de.WB.nBA.nBE.
32320	Mixed hardwood swamp	3.de.WB.nMH.
32321	Mixed hardwood swamp seepage subtype	3.de.WB.nMH.nMS.
32330	Aspen forest - saturated soils	3.de.WB.nAF.
32340	Altered/non-native saturated soils deciduous forest	3.de.WB.nAT.
32400	Seasonally flooded deciduous forest	3.de.WC.
32410	Black ash swamp - seasonally flooded	3.de.WC.nBA.
32420	Mixed hardwood swamp - seasonally flooded	3.de.WC.nMH.
32430	Altered/non-native seasonally flooded deciduous forest	3.de.WC.nAT.
33000	Mixed coniferous-deciduous forest	3.cd.
33100	Upland mixed coniferous-deciduous forest	3.cd.UP.
33110	Mixed pine-hardwood forest	3.cd.UP.nMF.
33120	Boreal hardwood-conifer forest	3.cd.UP.nBF.
33130	Northern hardwood-conifer forest	3.cd.UP.nNF.
33131	Northern hardwood-conifer forest yellow birch-white cedar subtype	3.cd.UP.nNF.nNY.
33140	White pine-hardwood forest	3.cd.UP.nWH.
33141	White pine-hardwood forest dry subtype	3.cd.UP.nWH.nWD.
33142	White pine-hardwood forest mesic subtype	3.cd.UP.nWH.nWE.

Woodland

40000	Woodland	4.
41000	Coniferous woodland	4.ce.
41100	Upland coniferous woodland	4.ce.UP.
41110	Jack pine woodland	4.ce.UP.nJW.
41120	Northern conifer woodland	4.ce.UP.nNW.
41130	Eastern Red Cedar woodland	4.ce.UP.nRC.
42000	Deciduous woodland	4.de.
42100	Upland deciduous woodland	4.de.UP.
42110	Aspen woodland	4.de.UP.nAW.
42120	Oak woodland-brushland	4.de.UP.nOW.
42130	Altered/non-native deciduous woodland	4.de.UP.nAT.
42200	Temporarily flooded deciduous woodland	4.de.WA.
42210	Altered/non-native deciduous woodland - temporarily flooded	4.de.WA.nAT.
42300	Saturated deciduous woodland	4.de.WB.
42310	Altered/non-native deciduous woodland - saturated	4.de.WB.nAT.
42400	Seasonally flooded deciduous woodland	4.de.WC.
42410	Altered/non-native deciduous woodland - seasonally flooded	4.de.WC.nAT.
43000	Mixed coniferous-deciduous woodland	4.cd.
43100	Upland mixed coniferous-deciduous woodland	4.cd.UP.
43110	Altered/non-native mixed woodland	4.cd.UP.nAT.

Shrubland

50000	Shrubland	5.
51000	Coniferous / evergreen shrubland	5.ce.
51100	Saturated needle-leaved or microphyllous evergreen	5.ce.WB.
51110	Open sphagnum bog	5.ce.WB.nOB.
51111	Open sphagnum bog intermediate subtype	5.ce.WB.nOB.nOI.
51112	Open sphagnum bog raised subtype	5.ce.WB.nOB.nOR.
51120	Scrub tamarack poor fen	5.ce.WB.nPT.
52000	Deciduous shrubland	5.de.
52100	Upland deciduous shrubland	5.de.UP.
52110	Mesic brush-prairie	5.de.UP.nMR.
52111	Mesic brush-prairie sand-gravel subtype	5.de.UP.nMR.nMG.
52120	Native dominated disturbed upland shrubland	5.de.UP.nNT.
52130	Altered/non-native dominated upland shrubland	5.de.UP.nAT.
52200	Temporarily flooded deciduous woodland	5.de.WA.
52210	Native dominated temporarily flooded shrubland	5.de.WA.nNT.
52220	Non-native dominated temporarily flooded shrubland	5.de.WA.nAT.
52230	Bog birch, spiraea temporarily flooded shrubland	5.de.WA.nBH.
52300	Saturated deciduous shrubland	5.de.WB.
52310	Shrub fen	5.de.WB.nSN.
52311	Poor fen shrub subtype	5.de.WB.nSN.nRH.
52312	Rich fen shrub subtype	5.de.WB.nSN.nPH.
52320	Wet brush-prairie	5.de.WB.nWB.
52321	Wet brush-prairie seepage subtype	5.de.WB.nWB.nWG.
52330	Altered/non-native dominated saturated shrubland	5.de.WB.nAT.
52340	Shrub swamp seepage subtype	5.de.WB.nSS.
52350	Alder swamp - saturated soils	5.de.WB.nAS.
52360	Willow swamp - saturated soils	5.de.WB.nWI.
52370	Wet meadow shrub subtype - saturated soils	5.de.WB.nWR.
52380	Bog birch, spiraea shrubland - saturated soils	5.de.WB.nBH.
52400	Seasonally flooded deciduous shrubland	5.de.WC.
52410	Alder swamp	5.de.WC.nAS.
52420	Wet meadow shrub subtype	5.de.WC.nWR.
52430	Willow swamp	5.de.WC.nWI.
52440	Altered/non-native dominated seasonally flooded shrubland	5.de.WC.nAT.
52450	Bog birch, spiraea shrubland - seasonally flooded	5.de.WC.nBH.
52500	Semipermanently flooded deciduous shrubland	5.de.WF.
52510	Wet meadow shrub - semipermanently flooded	5.de.WF.nWR.
52520	Willow swamp - semipermanently flooded	5.de.WF.nWI.
52530	Bog birch, spiraea shrubland - semipermanently flooded	5.de.WF.nBH.
52540	Altered/non-native dominated semipermanently flooded shrubland	5.de.WF.AT.

Herbaceous

60000	Herbaceous	6.
61000	Grassland or emergent vegetation	6.ge.
61100	Tall grassland	6.ge.TG.
61110	Mesic prairie	6.ge.TG.nMP.
61111	Mesic prairie carbonate bedrock subtype	6.ge.TG.nMP.nMA.
61112	Mesic prairie crystalline bedrock subtype	6.ge.TG.nMP.nMY.
61120	Tall grass altered/non-native dominated grassland	6.ge.TG.nAT.
61200	Medium-tall grassland	6.ge.MG.
61210	Dry Prairie	6.ge.MG.nDP.
61211	Dry Prairie barrens subtype	6.ge.MG.nDP.nDA.
61212	Dry Prairie bedrock bluff subtype	6.ge.MG.nDP.nDB.
61213	Dry Prairie sand-gravel subtype	6.ge.MG.nDP.nDG.
61214	Dry Prairie hill subtype	6.ge.MG.nDP.nDH.
61220	Medium-tall grass altered/non-native dominated grassland	6.ge.MG.nAT.
61300	Temporarily flooded graminoid vegetation	6.ge.WA.
61310	Wet prairie	6.ge.WA.nWP.
61311	Wet prairie saline subtype	6.ge.WA.nWP.nWA.
61320	Wet meadow - temporarily flooded soils	6.ge.WA.nWM.
61330	Temporarily flooded altered/non-native dominated grassland	6.ge.WA.nAT.
61340	Cattail marsh - temporarily flooded	6.ge.WA.nCM.
61400	Saturated graminoid vegetation	6.ge.WB.
61410	Wet prairie - saturated soils	6.ge.WB.nWP.
61411	Wet prairie saline subtype - saturated soils	6.ge.WB.nWP.nWA.
61412	Wet prairie seepage subtype - saturated soils	6.ge.WB.nWP.nWS.
61420	Wet meadow	6.ge.WB.nWM.
61430	Cattail marsh - saturated soils	6.ge.WB.nCM.
61440	Calcareous seepage fen	6.ge.WB.nCF.
61441	Calcareous seepage fen boreal subtype	6.ge.WB.nCF.nCB.
61442	Calcareous seepage fen prairie subtype	6.ge.WB.nCF.nCP.
61450	Poor fen	6.ge.WB.nPF.
61451	Poor fen sedge subtype	6.ge.WB.nPF.nPD.
61452	Poor fen patterned fen subtype	6.ge.WB.nPF.nPA.
61460	Rich fen	6.ge.WB.nRF.
61461	Rich fen sedge subtype	6.ge.WB.nRF.nRD.
61462	Rich fen floating-mat subtype - saturated soils	6.ge.WB.nRF.nRM.
61463	Rich fen patterned fen subtype	6.ge.WB.nRF.nRT.
61470	Open bog	6.ge.WB.nOB.
61471	Open sphagnum bog schlenke subtype	6.ge.WB.nOB.nOS.
61472	Graminoid bog	6.ge.WB.nOB.nGB.
61480	Saturated altered/non-native dominated graminoid vegetation	6.ge.WB.nAT.
61500	Seasonally flooded emergent vegetation	6.ge.WC.
61510	Cattail marsh - seasonally flooded	6.ge.WC.nCM.
61520	Mixed emergent marsh - seasonally flooded	6.ge.WC.nME.

61530	Seasonally flooded altered/non-native dominated emergent vegetation	6.ge.WC.nAT.
61540	Wet meadow - seasonally flooded	6.ge.WC.nWM.
61600	Semipermanently flooded emergent vegetation	6.ge.WF.
61610	Cattail marsh - semipermanently flooded	6.ge.WF.nCM.
61620	Mixed emergent marsh	6.ge.WF.nME.
61630	Semipermanently flooded altered/non-native dominated vegetation	6.ge.WF.nAT.
61640	Wet meadow - semipermanently flooded	6.ge.WF.nWM.
61641	Wet meadow floating mat subtype	6.ge.WF.nWM.nFV.
61650	Rich fen floating-mat subtype - semipermanently flooded	6.ge.WF.nRM.
61700	Intermittently exposed emergent vegetation	6.ge.WG.
61710	Cattail marsh - intermittently exposed	6.ge.WG.nCM.
61720	Mixed emergent marsh - intermittently exposed	6.ge.WG.nME.
61730	Intermittently exposed altered/non-native dominated vegetation	6.ge.WG.nAT.
61740	Rich fen floating-mat subtype - intermittently exposed	6.ge.WG.nRM.
61800	Permanently flooded emergent vegetation	6.ge.WH.
61810	Cattail marsh - permanently flooded	6.ge.WH.nCM.
61820	Mixed emergent marsh - permanently flooded	6.ge.WH.nME.
61830	Permanently flooded altered/non-native dominated vegetation	6.ge.WH.nAT.
61840	Rich fen floating-mat subtype - permanently flooded	6.ge.WH.nRM.
62000	Grassland with sparse tree layer	6.gt.
62100	Grassland with sparse deciduous trees	6.gt.GD.
62110	Aspen openings	6.gt.GD.nAO.
62111	Aspen openings sand gravel subtype	6.gt.GD.nAO.nAG.
62120	Dry oak savanna	6.gt.GD.nDO.
62121	Dry oak savanna hill subtype	6.gt.GD.nDO.nDI.
62122	Dry oak savanna barrens subtype	6.gt.GD.nDO.nDN.
62123	Dry oak savanna sand-gravel subtype	6.gt.GD.nDO.nDR.
62130	Mesic oak savanna	6.gt.GD.nMO.
62140	Grassland with sparse deciduous trees - altered/non-native dominated vegetation	6.gt.GD.nAT.
62200	Grassland with sparse conifer or mixed deciduous/coniferous trees	6.gt.GC.
62210	Jack pine barrens	6.gt.GC.nJB.
62220	Grassland with sparse conifer or mixed deciduous/coniferous trees - altered/non-native dominated	6.gt.GC.nAT.
62300	Temporarily flooded grassland with sparse deciduous trees	6.gt.WA.
62310	Altered/non-native grassland with sparse deciduous trees - temporarily flooded	6.gt.WA.nAT.
62400	Saturated grassland with sparse deciduous trees	6.gt.WB.
62410	Altered/non-native grassland with sparse deciduous trees - saturated soils	6.gt.WB.nAT.
62500	Seasonally flooded grassland with sparse deciduous trees	6.gt.WC.
62510	Altered/non-native grassland with sparse deciduous trees - seasonally flooded	6.gt.WC.nAT.
63000	Perennial forb vegetation	6.pf.
63100	Upland forb vegetation	6.pf.UP.
63110	Talus slope algific subtype	6.pf.UP.nTL.
63200	Saturated forb vegetation	6.pf.WB.

63210	Seepage meadow	6.pf.WB.nSM.
64000	Hydromorphic rooted vegetation	6.hr.
64100	Standing water hydromorphic rooted vegetation	6.hr.SW.
64110	Water lily	6.hr.SW.nWL.
64111	Water lily open marsh	6.hr.SW.nWL.nLC.
64112	Boreal water lily aquatic wetland	6.hr.SW.nWL.nLL.
64113	Northern water lily aquatic wetland	6.hr.SW.nWL.nLN.
64120	Midwest pondweed submerged aquatic wetland	6.hr.SW.nPW.
65000	Annual grasslands or forb vegetation	6.ag.
65100	Seasonally flooded annual forb vegetation	6.ag.WC.
65110	Slender glasswort saline meadow	6.ag.WC.nSG.

Nonvascular vegetation

70000	Nonvascular vegetation	7.
71000	Lichen vegetation	7.li.
71100	Lichen vegetation with sparse tree layer	7.li.LT.
71110	Northern conifer scrubland	7.li.LT.nNS.

Sparse vegetation

80000	Sparse vegetation	8.
81000	Consolidated rock (cliffs, bedrock, etc.)	8.cr.
81100	Cliffs with sparse vegetation	8.cr.CL.
81110	Open cliff	8.cr.CL.nOC.
81111	Great Lakes shore basalt/diabase cliff	8.cr.CL.nOC.nBD.
81112	Northern (Laurentian) igneous/metamorphic dry cliff	8.cr.CL.nOC.nIG.
81113	Midwest dry limestone/dolostone cliff	8.cr.CL.nOC.nLD.
81114	Midwest sandstone dry cliff	8.cr.CL.nOC.nDC.
81115	Midwest sandstone moist cliff	8.cr.CL.nOC.nMC.
81116	Great Lakes shoreline granite/metamorphic cliff	8.cr.CL.nOC.nGR.
81120	Wet cliff	8.cr.CL.nTC.
81121	Maderate cliff	8.cr.CL.nTC.nMM.
81122	Midwest sedimentary dripping cliff	8.cr.CL.nTC.nSD.
81130	Rock outcrop / butte	8.cr.CL.nRO.
81131	Northern (Laurentian) granite/metamorphic rock outcrop	8.cr.CL.nRO.nGG.
81132	Midwest quartzite - granite rock outcrop	8.cr.CL.nRO.nQG.
81200	Level bedrock with sparse vegetation	8.cr.LB.
81210	Open level bedrock	8.cr.LB.nLB.
81211	Inland lake igneous/metamorphic bedrock shore	8.cr.LB.nLB.nLE.
81212	Great Lakes basalt (conglomerate) bedrock lakeshore	8.cr.LB.nLB.nBC.
81213	Great Lakes limestone-dolostone bedrock lakeshore	8.cr.LB.nLB.nTB.
81214	Great Lakes sandstone bedrock shore	8.cr.LB.nLB.nSL.
81215	River ledge sandstone pavement	8.cr.LB.nLB.nRE.
82000	Boulder, gravel, cobble, or talus	8.bg.
82100	Lowland or submontane talus / scree slopes	8.bg.TS.
82110	Lowland talus	8.bg.TS.nTA.
82111	Northern granite/metamorphic talus	8.bg.TS.nTA.nTG.
82112	Midwest limestone - dolostone talus	8.bg.TS.nTA.nTD.
82113	Northern sandstone talus	8.bg.TS.nTA.nTN.
82114	Northern basalt/diabase open talus	8.bg.TS.nTA.nTF.
82200	Cobble / gravel beaches and shores	8.bg.BS.
82210	Cobble / gravel shore	8.bg.BS.nCG.
82211	Great Lakes basalt/diabase cobble-gravel lakeshore	8.bg.BS.nCG.nLG.
82212	Riverine igneous/metamorphic cobble-gravel shore	8.bg.BS.nCG.nRG.
82213	Great Lakes non-alkaline cobble/gravel shore	8.bg.BS.nCG.nGC.
82214	Inland lake igneous/metamorphic cobble-gravel shore	8.bg.BS.nCG.nIM.
83000	Unconsolidated material (soil, sand, and ash)	8.um.
83100	Sand flats	8.um.SF.
83110	Inland strand beach	8.um.SF.nIS.
83111	Inland freshwater strand beach	8.um.SF.nIS.nLS.
83200	Temporarily flooded sand flats	8.um.AS.
83210	Sand flats temporarily flooded	8.um.AS.nST.
83211	Lacustrine sand flats - bars	8.um.AS.nST.nFB.

83212	Riverine sand flats - bars	8.um.AS.nST.nRS.
83300	Seasonally / temporarily flooded mud flats	8.um.MF.
83310	Non-tidal mud flat seasonally / temporarily flooded	8.um.MF.nMU.
83311	Lake mud flats	8.um.MF.nMU.nLM.
83312	River mud flats	8.um.MF.nMU.nRU.
83313	Saline spring mud flats	8.um.MF.nMU.nMN.

Water

90000	Water	9.
91000	River (riverine)	9.ri.
91100	Slow moving linear open water habitat	9.ri.S.
91200	Fast moving linear open water habitat	9.ri.FR.
92000	Lake (lacustrine)	9.la.
92100	Limnetic open water	9.la.LC.
92200	Semipermanently flooded littoral aquatic bed	9.la.WF.
92210	Floating algae - semipermanently flooded littoral aquatic bed	9.la.WF.nFA.
92220	Floating vascular vegetation - semipermanently flooded littoral aquatic bed	9.la.WF.nFV.
92300	Intermittently exposed littoral aquatic bed	9.la.WG.
92310	Floating algae - intermittently exposed littoral aquatic bed	9.la.WG.nFA.
92320	Floating vascular vegetation - intermittently exposed littoral aquatic bed	9.la.WG.nFV.
92400	Permanently flooded littoral aquatic bed	9.la.WH.
92410	Floating algae - permanently flooded littoral aquatic bed	9.la.WH.nFA.
92420	Floating vascular vegetation - permanently flooded littoral aquatic bed	9.la.WH.nFV.
92500	Littoral open water	9.la.LL.
93000	Wetland-open water (palustrine)	9.ww.
93100	Intermittently exposed aquatic bed	9.ww.WG.
93110	Floating algae - intermittently exposed aquatic bed	9.ww.WG.nFA.
93120	Floating vascular vegetation - intermittently exposed aquatic bed	9.ww.WG.nFV.
93200	Permanently flooded aquatic bed	9.ww.WH.
93210	Floating algae	9.ww.WH.nFA.
93220	Floating vascular vegetation	9.ww.WH.nFV.
93300	Palustrine open water	9.ww.OW.

Definitions of the alphanumeric characters

LEVEL 1

1. Artificial Surfaces
2. Cultivated or Planted
3. Forests
4. Woodland
5. Shrubland
6. Herbaceous
7. Nonvascular
8. Sparse Vegetation
9. Water

LEVEL 2

Level 2 - Cultural

ch.	Cultivated Herbaceous
hh.	Herbaceous
mv.	Minimal Vegetation
ph.	Planted Herbaceous
ss.	Shrubs
sv.	Shrubs and Vines
tt.	Trees

Level 2 - Natural

ag.	Annual Grasslands or Forb Vegetation
bg.	Boulder, Gravel, Cobble, or Talus
cd.	Mixed Coniferous and Deciduous
ce.	Coniferous / Evergreen
cr.	Consolidated Rock
de.	Deciduous
ge.	Grassland or Emergent Vegetation
gt.	Grassland with Sparse Trees
hr.	Hydromorphic Rooted Vegetation
la.	Lake
li.	Lichen
pf.	Perennial Forb Vegetation
ri.	River (Riverine)
um.	Unconsolidated Material
ww.	Wetland / Open Water

LEVEL 3

Level 3 - Cultural

BP.	Buildings or Pavement
CB.	Cultural Coniferous Shrubs
CC.	Cultural Conifers

CD. Cultural Deciduous
CE. Cultural Shrubs with Trees
CF. Cultural Grasses and Forbs
CG. Cultural Grasses
CM. Cultural Mixed Coniferous/Deciduous
CN. Cultural Gardens
CO. Cultural Deciduous Shrubs
CS. Cultural Mixed Shrubs
CT. Cultural Grasses with Trees
EE. Exposed Earth
GN. Close Grown Cropland
RC. Row Cropland

Level 3 - Natural, Plant Physiognomics

GC. Grassland with Sparse Coniferous Trees
GD. Grassland with Sparse Deciduous Trees
LT. Lichen Vegetation with Sparse Trees
MG. Medium-tall Grass
TG. Tall Grass

Level 3 - Natural, Geomorphology and Hydrology

AS. Temporarily Flooded Sand Flats
BS. Cobble / Gravel Beaches and Shores
CL. Cliffs
FR. Fast River
LB. Level Bedrock
LC. Limnetic
LL. Littoral
MF. Seasonally / Temporarily Flooded Mud Flats
OW. Palustrine Open Water
SF. Sand Flats
SR. Slow River
SW. Standing Water
TS. Lowland Talus / Scree
UP. Upland

Level 3 - Cowardin Hydrology

WA. Temporarily flooded
WB. Saturated
WC. Seasonally flooded
WF. Semi-permanently flooded
WG. Intermittently exposed
WH. Permanently flooded

LEVEL 4

Level 4 - Cultural, Artificial Surfaces

i10. 4% to 10% Impervious Cover
i25. 11% to 25% Impervious Cover
i50. 26% to 50% Impervious Cover
i75. 51% to 75% Impervious Cover

i90. 76% to 90% Impervious Cover
i99. 91% to 100% Impervious Cover

Level 4 - Cultural, Exposed Earth

e10. 0% to 10% Impervious Cover-Exposed Earth
e25. 11% to 25% Impervious Cover-Exposed Earth
e50. 26% to 50% Impervious Cover-Exposed Earth

Level 4 - Cultural, Soil Hydrology

pFL. Artificially flooded
pHS. Hydric Soils
pUS. Upland Soils

LEVEL 4 & 5

Level 4 & 5 - Cultural Communities

cAB. Aspen-birch
cAF. Aspen
cAO. Aspen Openings
cBA. Barley
cBB. Blackberry
cBD. Buildings
cBG. Boxelder-green ash
cBL. Blueberry
cBN. Beans
cBP. Buildings and Pavement
cCB. Cranberry
cCO. Corn
cDP. Dry Prairie
cFB. Forbs
cFW. Fallow
cGL. Long Grass
cGP. Grape
cGS. Short Grass
cHF. Hayfield
cJB. Jack Pine Barrens
cJP. Jack Pine
cLF. Landfill
cMB. Maple-basswood
cMF. Mixed Pine Hardwood
cMN. Mines
cMP. Mesic Prairie
cNF. Northern Hardwood Conifer
cNH. Northern Hardwood
cNP. Not Planted
cNW. Northern Conifers
cOA. Oak Forest
cOB. Other Shrubs

cOC. Other Close Grown crops
cOE. Other Exposed
cOR. Other Shrubs with Trees
cOS. Oak Savanna
cOT. Oats
cOV. Other Vegetables
cOW. Oak woodland
cOX. Other Shrub / Vines
cPA. Planted Ash
cPC. Planted Conifers
cPD. Planted Deciduous
cPF. Fruit Trees
cPK. Pumpkins
cPL. Planted Landscape
cPM. Planted Mixed Conifer - Deciduous
cPO. Planted Oak
cPP. Potato
cPR. Planted Red Pine
cPS. Planted Spruce
cPT. Walnut trees
cPV. Pavement
cPW. Planted White Pine
cRB. Raspberry - black
cRC. Red Cedar
cRI. Rice
cRR. Raspberry - red
cSB. Soybeans
cSD. Sod
cSF. Spruce Fir
cSG. Sand and Gravel
cST. Sugar Beets
cVG. Vegetables
cWF. White Pine
cWH. White Pine Hardwood
cWT. Wheat

Level 4 & 5 - Natural Communities

nAB. Aspen-birch Forest
nAC. Open Great Lakes Alkaline Cliff
nAF. Aspen Forest
nAG. Aspen Openings Sand-gravel Subtype
nAN. Aspen-birch Forest Northern Hardwoods Subtype
nAO. Aspen Openings
nAS. Alder Swamp
nAT. Altered/non-native
nAU. Aspen-birch Forest Spruce-fir Subtype
nAW. Aspen Woodland
nBA. Black Ash Swamp
nBB. Black Spruce Bog

nBC. Great Lakes Basalt (Conglomerate) Bedrock Lake Shore
nBD. Basalt / Diabase Great Lakes Cliff Sparse Vegetation
nBE. Black Ash Swamp Seepage Subtype
nBF. Boreal Hardwood-conifer Forest
nBG. Boxelder - Green Ash Disturbed Native Forest
nBH. Birch bog - spiraea shrubland
nBI. Black Spruce Bog Intermediate Subtype
nBL. Black Spruce-feathermoss Forest
nBR. Black Spruce Bog Raised Subtype
nBS. Black Spruce Swamp
nCB. Calcareous Seepage Fen Boreal Subtype
nCF. Calcareous Seepage Fen
nCG. Cobble / Gravel Shore
nCM. Cattail Marsh
nCP. Calcareous Seepage Fen Prairie Subtype
nDA. Dry Prairie Barrens Subtype
nDB. Dry Prairie Bedrock Bluff Subtype
nDC. Sandstone Dry Cliff
nDG. Dry Prairie Sand-gravel Subtype
nDH. Dry Prairie Hill Subtype
nDI. Dry Oak Savanna Hill Subtype
nDN. Dry Oak Savanna Barrens Subtype
nDO. Dry Oak Savanna
nDP. Dry Prairie
nDR. Dry Oak Savanna Sand-gravel Subtype
nDT. Disturbed Natural Community
nFA. Floating Algae
nFB. Lacustrine Sand Flats - Bars
nFF. Floodplain Forest
nFM. Floodplain Forest Silver Maple Subtype
nFO. Floodplain Forest Swamp White Oak Subtype
nFV. Floating Vascular Vegetation
nGB. Graminoid Bog
nGC. Non-alkaline Cobble - Gravel Lakes Shore
nGG. Granite / Metamorphic Rock Outcrop
nGR. Granite / Metamorphic Great Lakes Cliff
nIG. Northern (Laurentian) Igneous/Metamorphic Dry Cliff
nIM. Inland Lake Igneous/Metamorphic Cobble-gravel Shore
nIS. Inland Strand Beach
nJB. Jack Pine Barrens
nJF. Jack Pine Forest Jack Pine-fir Subtype
nJH. Jack Pine Forest Hazel Subtype
nJO. Jack Pine Forest Jack Pine-oak Subtype
nJP. Jack Pine Forest
nJS. Jack Pine Forest Jack Pine-black Spruce Subtype
nJW. Jack Pine Woodland
nJY. Jack Pine Forest Blueberry Subtype
nLB. Open Level Bedrock
nLC. Central Water Lily Aquatic Wetland

nLD. Limestone / Dolostone Midwest Dry Cliff
nLE. Lake Beach Bedrock Subtype
nLG. Gravel - Cobble Lake Shore
nLH. Lowland Hardwood Forest
nLL. Boreal Water Lily Aquatic Wetland
nLM. Lake Beach Mud Subtype
nLN. Northern Water Lily Aquatic Wetland
nLS. Lake Beach Sand Subtype
nMA. Mesic Prairie Carbonate Bedrock Subtype
nMB. Maple-basswood Forest
nMC. Sandstone Moist Cliff
nME. Mixed Emergent Marsh
nMF. Mixed Pine-hardwood Forest
nMG. Mesic Brush Prairie Sand-gravel Subtype
nMH. Mixed Hardwood Swamp
nMM. Moist Cliff Maderate Subtype
nMN. Mud Flat Saline Subtype
nMO. Mesic Oak Savanna
nMP. Mesic Prairie
nMR. Mesic Brush Prairie
nMS. Mixed Hardwood Swamp Seepage Subtype
nMU. Mud Flat
nMY. Mesic Prairie Crystalline Bedrock Subtype
nNF. Northern Hardwood-conifer Forest
nNH. Northern Hardwood Forest
nNS. Northern Conifer Scrubland
nNT. Native Dominant
nNW. Northern Conifer Woodland
nNY. Northern Hardwood-conifer Forest, yellow birch-white cedar
nOA. Oak Forest
nOB. Open Sphagnum Bog
nOS. Open Sphagnum Bog Schlenke Subtype
nOW. Oak Woodland-brushland
nPA. Poor Fen Patterned Subtype
nPB. Paper Birch Forest
nPD. Poor Fen Sedge Subtype
nPF. Poor Fen
nPH. Poor Fen Shrub Subtype
nPN. Paper Birch Forest Northern Hardwoods Subtype
nPS. Paper Birch Forest Spruce-fir Subtype
nPT. Poor Fen Scrub Tamarack Subtype
nPW. Midwest Pondweed Submerged Aquatic Wetland
nQG. Quartzite - Granite Rock Outcrop
nRC. Red Cedar Woodland
nRD. Rich Fen Sedge Subtype
nRE. Sandstone Bedrock River Shore
nRF. Rich Fen
nRG. Cobble - Gravel River Shore
nRH. Rich Fen Shrub Subtype

nRM. Rich Fen Floating-mat Subtype
nRO. Rock Outcrop
nRP. Red Pine Forest
nRS. River Beach Sand Subtype
nRT. Rich Fen, Patterned Subtype
nRU. River Mud Flats
nRW. Red Saltwort
nSB. Spruce-fir Forest White Spruce-balsam Fir Subtype
nSC. Sandstone Cliff Great Lakes
nSD. Sedimentary Dripping Bluff - Cliff
nSF. Spruce-fir Forest
nSG. Slender Glasswort Saline Meadow
nSI. Spruce-fir Forest Fir-birch Subtype
nSL. Sandstone Bedrock Great Lakes Shore
nSM. Seepage Meadow
nSN. Shrub Fen
nSS. Shrub Swamp Seepage Subtype
nST. Sand Flats Temporarily Flooded
nTA. Talus Slope
nTB . Great Lakes Limestone Bedrock Lake Shore
nTC. Wet Cliff
nTD. Limestone - Dolomite Talus
nTE. Tamarack Swamp Seepage Subtype
nTF. Basalt/Diabase Open Talus
nTG. Granite / Metamorhic Talus Northern
nTL. Talus Slope Algific Subtype
nTM. Tamarack Swamp Minerotrophic Subtype
nTN. Sandstone Talus Northern
nTP. Tamarack Swamp Sphagnum Subtype
nTS. Tamarack Swamp
nUD. Upland White Cedar Woodland Cliff
nUE. Upland White Cedar Forest Wet-mesic Subtype
nUM. Upland White Cedar Forest Mesic Subtype
nUW. Upland White Cedar Forest
nWA. Wet Prairie Saline Subtype
nWB. Wet Brush Prairie
nWC. White Cedar Swamp
nWD. White Pine-hardwood Forest Dry Subtype
nWE. White Pine-hardwood Forest Mesic Subtype
nWF. White Pine Forest
nWG. Wet Brush Prairie Seepage Subtype
nWH. White Pine-hardwood Forest
nWI. Willow Swamp
nWL. Water Lilly
nWM. Wet Meadow
nWP. Wet Prairie
nWR. Wet Meadow Shrub Subtype
nWS. Wet Prairie Seepage Subtype
nWT. White Cedar Swamp Seepage Subtype


Hennepin


GREAT
RIVER
GREENING