

Natural Resources Inventory of the City of Plymouth, Minnesota



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

**Prepared for the City of Plymouth and
Hennepin County Department of Environmental Services**

by

**Tony Randazzo
Fred Harris
Hugh Johnson
of
Great River Greening**

and

**David Thill
of
Hennepin County Environmental Services**

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INTRODUCTION

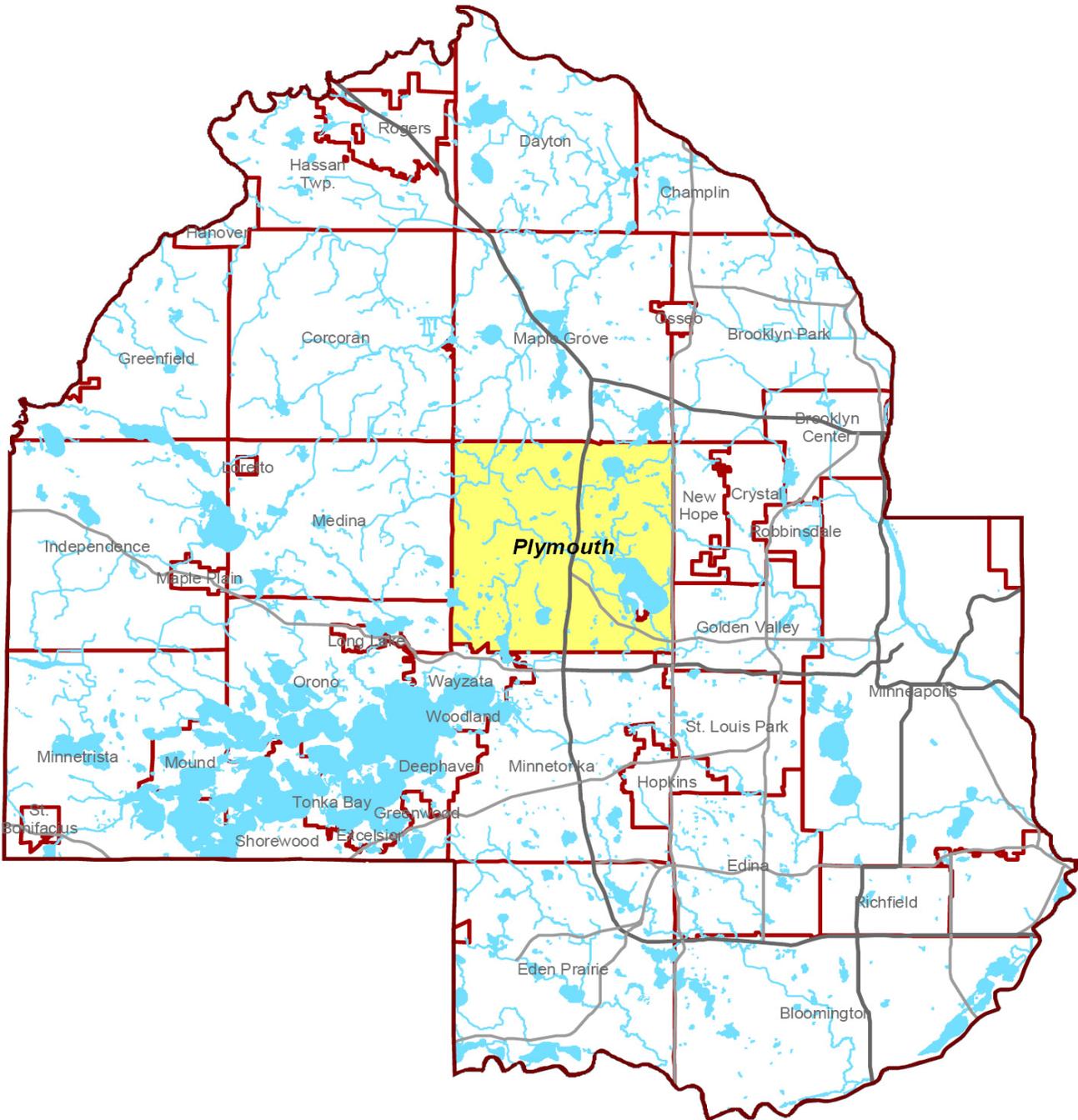
In 2005, Hennepin County Department of Environmental Services (HCDES) retained Great River Greening (GRG) to conduct land cover classification mapping and a natural areas assessment within the City of Plymouth and Medicine Lake, in Hennepin County, Minnesota (Figure 1). The Minnesota Land Cover Classification 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 Plymouth.

The goal of the project was to divide and classify the area constituting the City of Plymouth 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 summer of 2006, 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. The field check phase of the project is also where additional information such as species lists and other appropriate coding modifiers, which provide detail, were recorded.

GRG staff identified 3555 distinct landscape areas within the municipal boundary for the City of Plymouth. All land cover was coded to the highest level of detail (Level 5) and approximately 85% of all land-use polygons were field checked at least from the edge (level 2) or higher. During the 2006 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, 162 natural areas were identified of sufficient quality to receive Natural Community Quality Rankings according to the DNR's Natural Heritage Element Occurrence Ranking Guidelines. Of the 162 natural areas, 6 were provided with the highest quality (A) ranking. Five of these natural areas are high quality wetland communities (Floating Mat, Wet Meadow and Shrub Swamp) and one Oak Forest community in the heart of Plymouth. Nineteen natural areas were ranked as good quality natural condition (B) ranking. Eleven of these natural areas are either remnant Oak Forest or Maple Basswood with the remainder being wetland communities. Seventy-one 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 Plymouth, 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.

Hennepin County, Minnesota



Project Location Map

City of Plymouth Land Cover Classification and Natural Resource Inventory

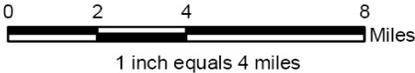


Figure 1

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.

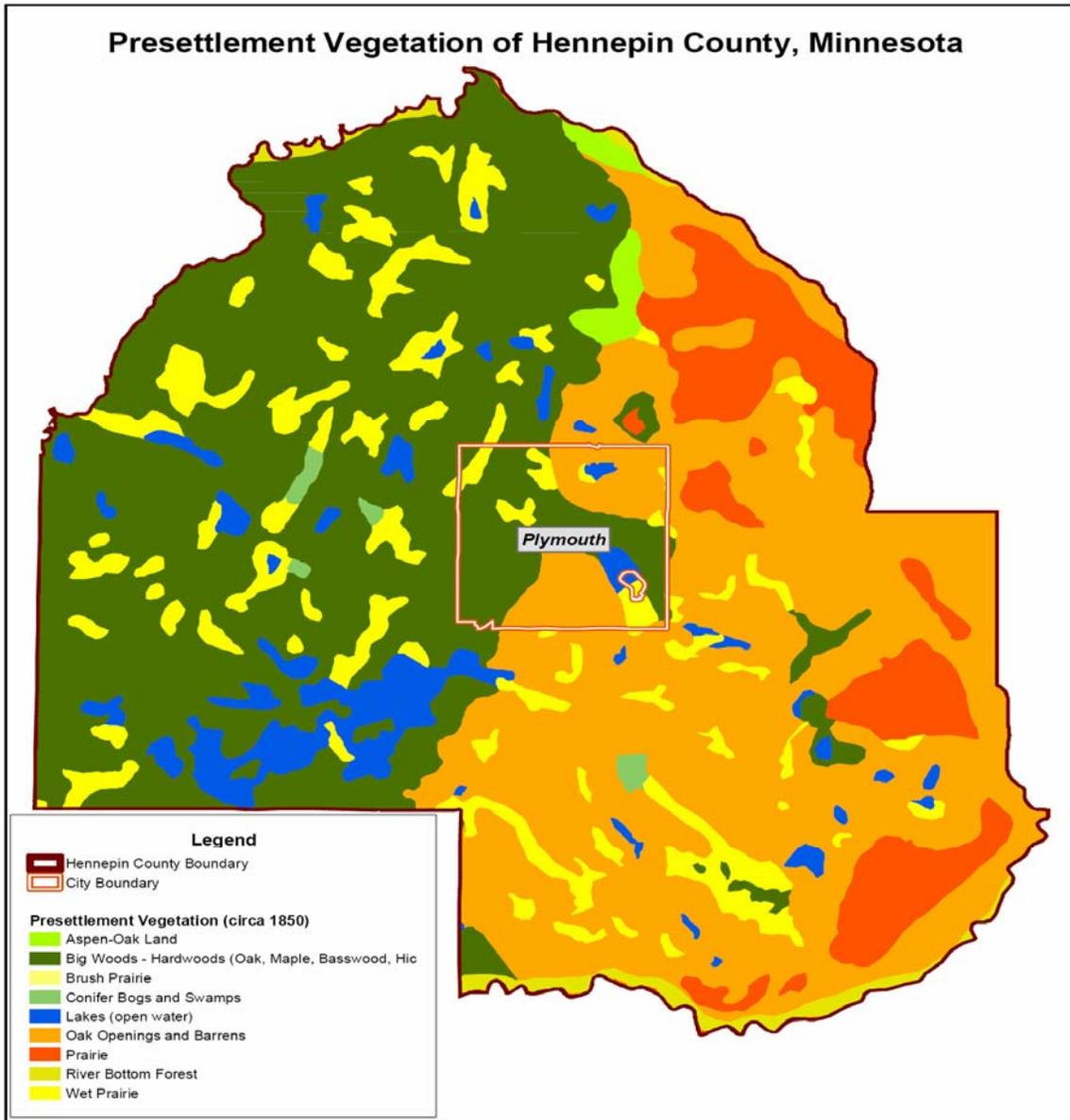
Pre-settlement Vegetation

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 Plymouth was comprised primarily of Maple-Basswood forests or “Big Woods” in the west and “Oak Openings and Barrens” in the east (Marschner 1974). Small inclusions of “Wet Prairie” and lakes as well as occasional Tamarack Bogs were also reported (Figure 2).

The Big Woods was a large region of fire-protected hardwood forests that covered the western half 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.

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).



Presettlement Vegetation Map

City of Plymouth Land Cover Classification and Natural Resource Inventory

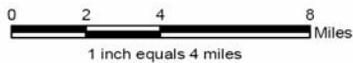


Figure 2

National Wetlands Inventory (NWI)

Figure 3 shows the NWI map for Plymouth. 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 Drainage Class

Figure 4 shows the soil survey drainage classes for Plymouth. A digital version of the Soil Survey of Hennepin County was used to assess the historic and current soil types that occur within the city. The soils of western Hennepin County are predominantly fine textured silt loams and clay loams, which tend to support mesic native plant communities in the uplands (such as mesic oak forest, maple basswood forest, and mesic prairie). These soils are also well-suited for agricultural crops such as corn and soybeans, as well as pasture lands. In addition, poorly drained landscape depressions occur frequently in this portion of western Hennepin County, and tend to support hydrophytic vegetation (i.e., wetland plants such as sedges, grasses, rushes, and wetland herbs) and organic soil accumulation. According to the soil survey, the predominant upland soil types within the City of Plymouth include Lester, Angus, and Hamel complex loams). Common hydric soils within the city include: Cordova loam, Muskego and Houghton soils, and Glencoe loam soils. During the land cover classification process, the soil survey is very useful in determining if land cover types occur on hydric (i.e., poorly drained or wet) or non-hydric (i.e., well-drained or upland) soils, especially when classifying cropland and herbaceous vegetation types.

National Wetlands Inventory

City of Plymouth Land Cover Classification and Natural Resources Inventory

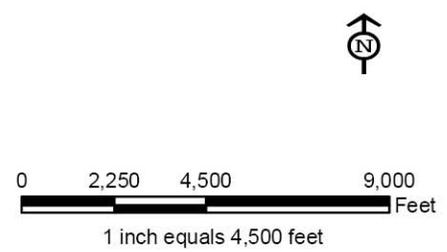
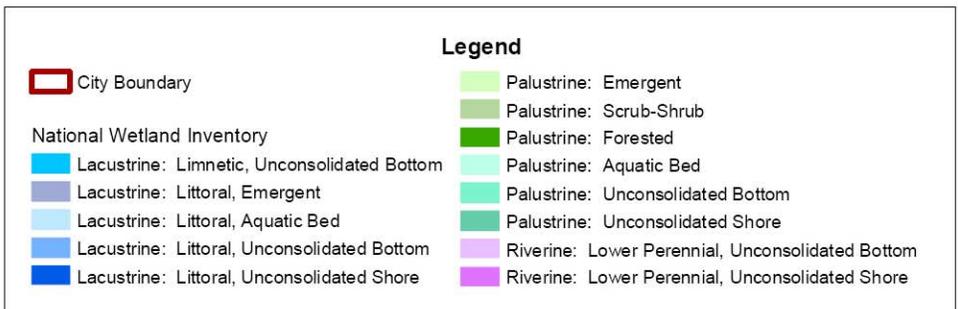
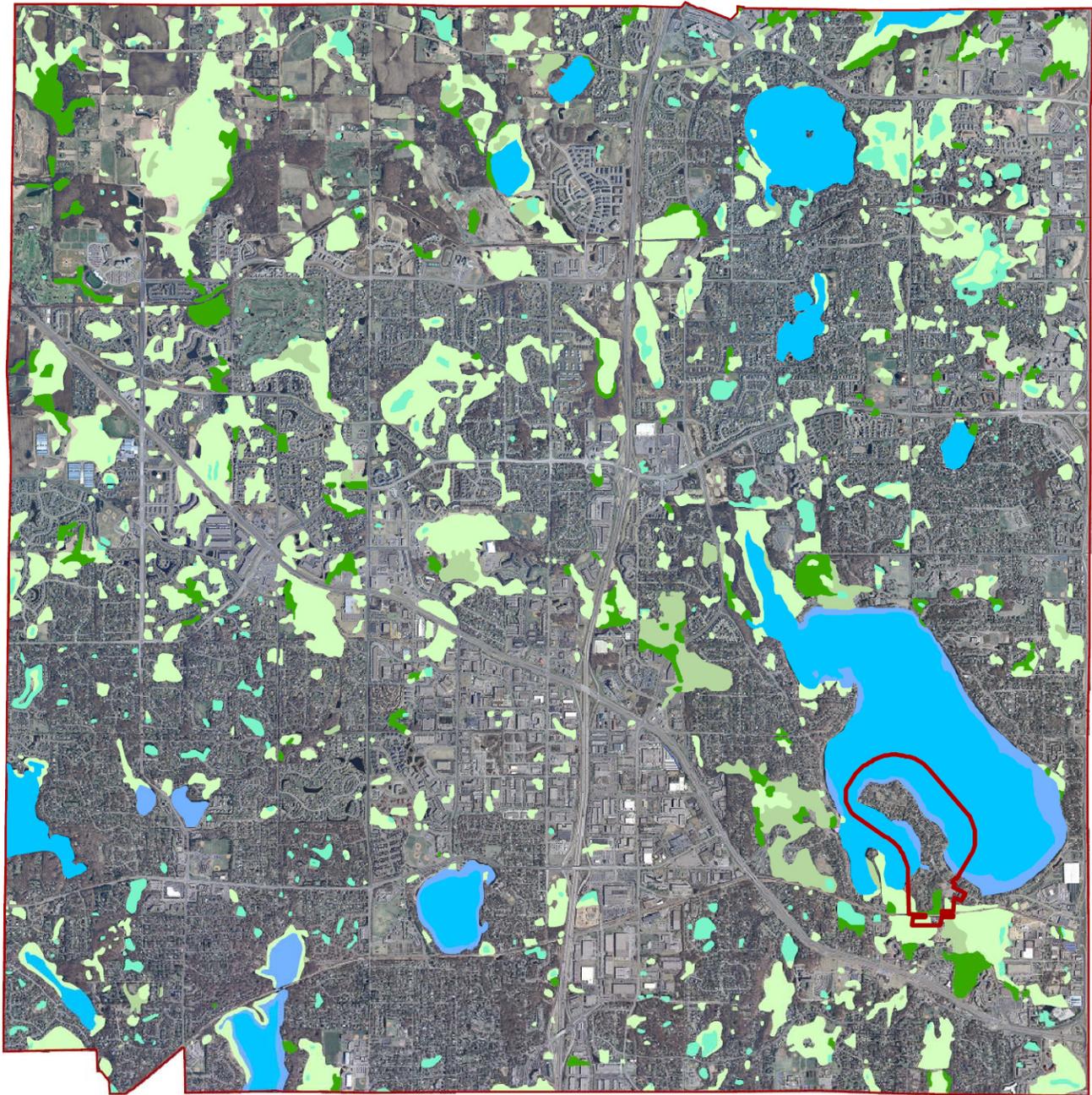
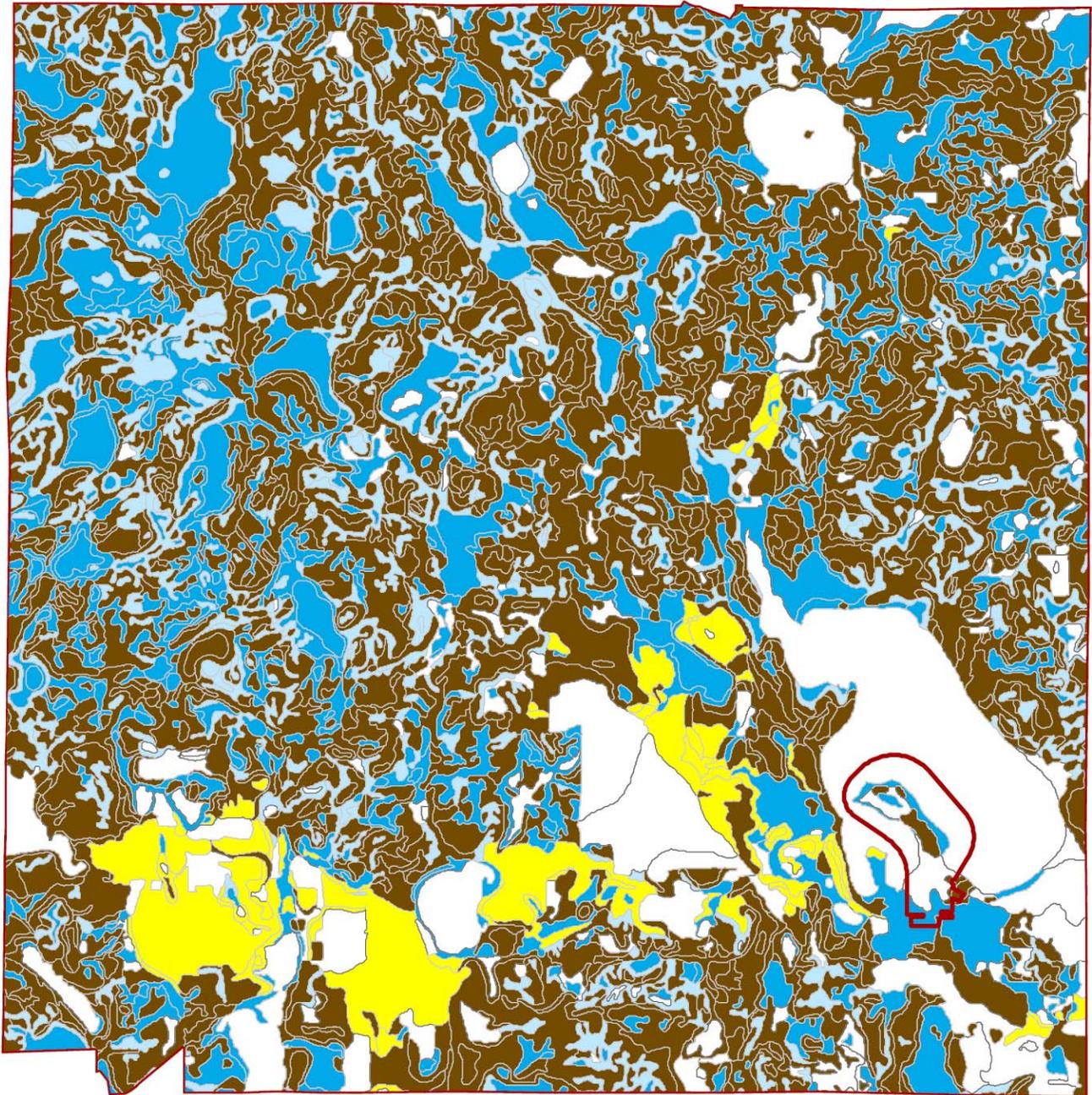
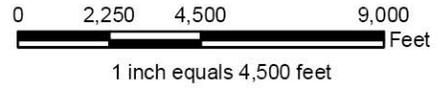


Figure 3

Soil Survey Drainage Class Map

City of Plymouth Land Cover Classification
and Natural Resources Inventory



Legend

 City Boundary

HC Soils Data

Drainage Class

 Excessively to Somewhat excessively drained

 Well to Moderately well drained

 Somewhat poorly drained

 Poorly to Very poorly drained

 Drainage Class Not Identified

Figure 4

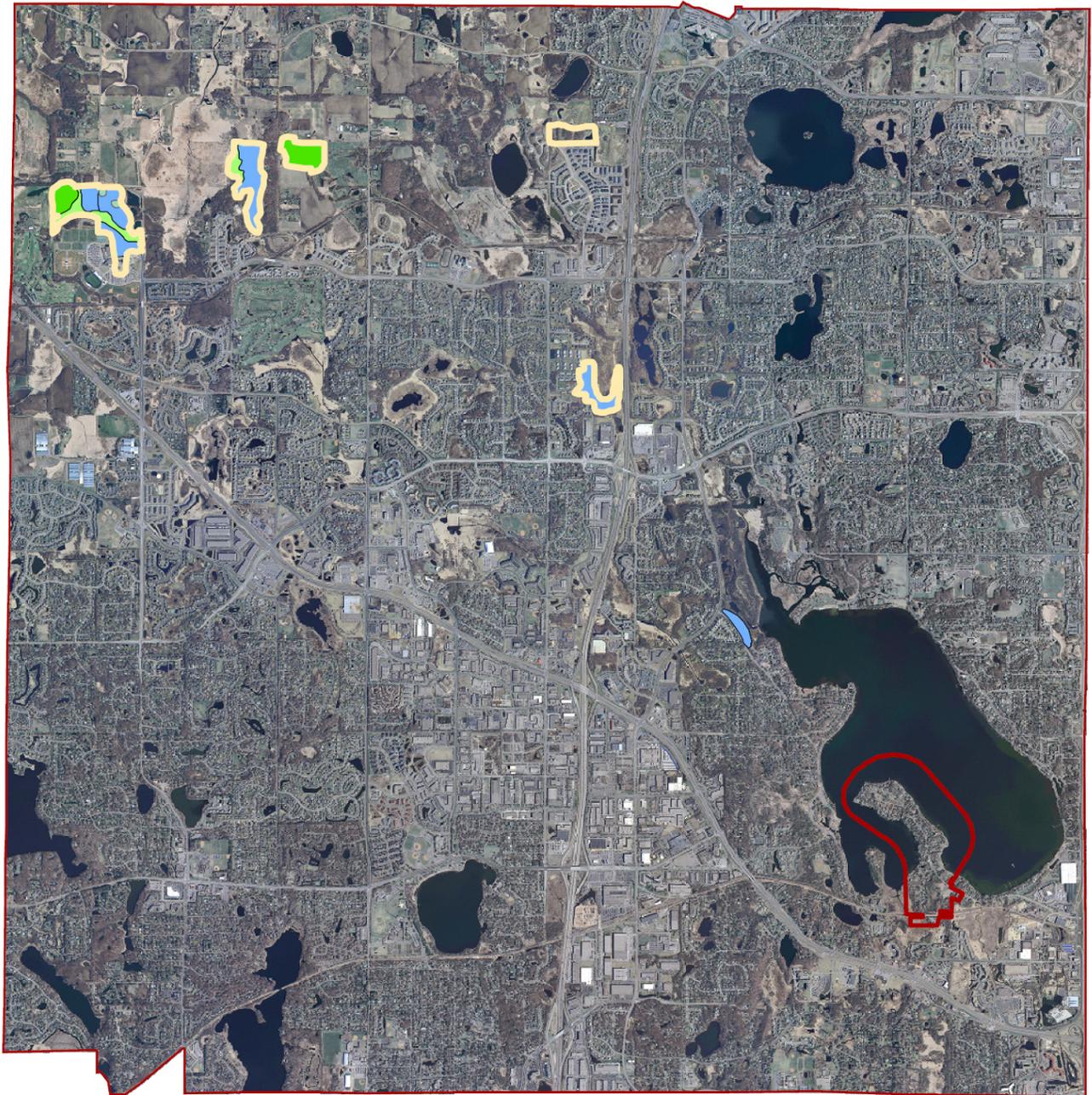
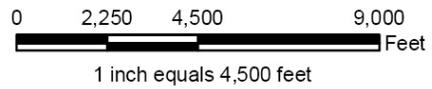
Minnesota County Biological Survey (MCBS)

Figure 5 shows native plant communities mapped by the MCBS in the City of Plymouth. In 1998, 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 Plymouth 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 twelve natural communities included in the MCBS within the City of Plymouth (Figure 5).

- Two Lowland Hardwood Forests
- Six Maple/Basswood Forests
- Two Oak Forest, Mesic subtype
- Two Wet Meadows

County Biological Survey Sites

City of Plymouth Land Cover Classification and Natural Resources Inventory



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 36 sections comprising the City of Plymouth. 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 January – September of 2006, photo interpreted, coded, and digitized the of the City of Plymouth/Medicine Lake. 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.

Land cover areas for Plymouth sections 3, 4, 5, 8, and 9 were digitized using 2004 USGS 0.3 meter resolution color aerial photos. Plymouth sections 6, 7, and 18, were digitized using the 2003 FSA aerials, due to lack of coverage by the 2004 photos. These sections were digitized prior to field checking as requested by HCDES in order to produce a preliminary report on the northwest corner, or least developed sections, of Plymouth. The remaining sections were digitized following the field check using the same Hennepin County 2004 True Color Orthophotography Background photos that were used for the photo interpretation.

FIELD EVALUATION

All land cover areas were field checked in April - September 2006. 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).

MLCCS MODIFIERS

Several 'classes' of MLCCS modifiers were assessed in the field during the evaluation of the land cover classification of Plymouth. 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 Plymouth 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 Plymouth Surveys		
Species Code	Common Name	Scientific Name
402	Purple Loosestrife	<i>Lythrum salicaria</i>
406	Narrow-Leaf Cattail	<i>Typha angustifolia</i>
408	Common Buckthorn	<i>Rhamnus cathartica</i>
412	Reed Canary Grass	<i>Phalaris arundinacea</i>
410	Tartarian Honeysuckle	<i>Lonicera tatarica</i>
411	Garlic Mustard	<i>Alliaria petiolata</i>
412	Reed Canary Grass	<i>Phalaris arundinacea</i>
413	Smooth Brome	<i>Bromus inermis</i>
417	Common Reed Grass	<i>Phragmites australis</i>

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

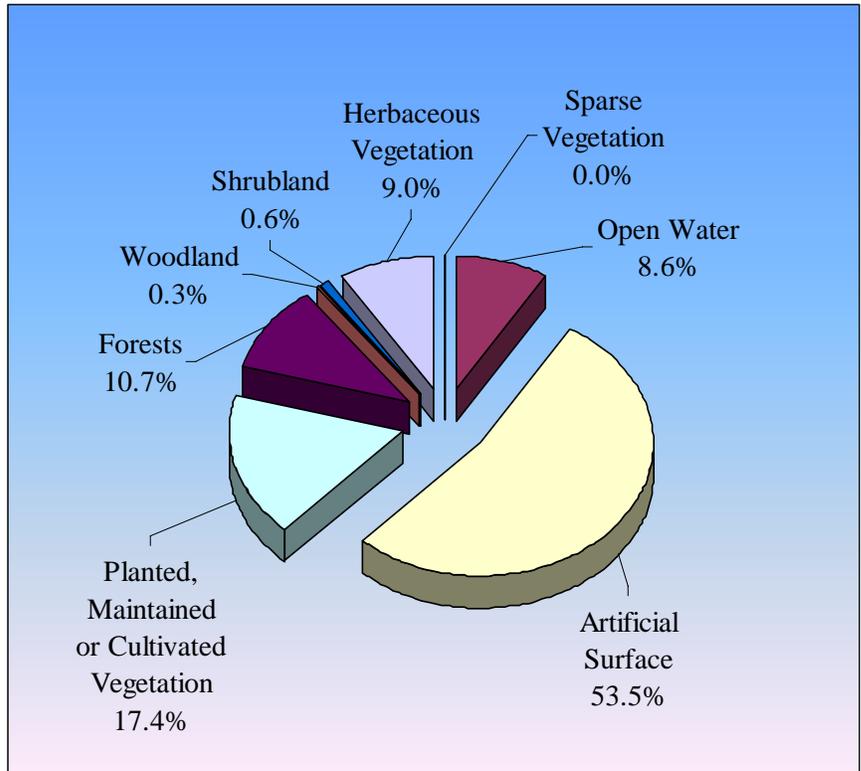
Field Check Level	Description
4	Visited Entirely
3	Visited Partially
2	Viewed From Edge
1	Viewed From a Distance
0	Not Checked

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 3,555 individual land cover areas. 79 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. The areas that are not a result of artificially clipping at the city boundary range from 0.11 acres (An isolated depression of Water- Floating vascular vegetation within a forested setting) to 963.25 acres (Pavement 91 -100% impervious surface.), which is the connected land cover area comprising major roads.

Figures 6 and 7 depict the MLCCS land cover types for levels one and three for the City of Plymouth. 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 53.5% of Plymouth, covering 12,084.5 acres. The



“Planted or cultivated vegetation” category, which is also the other cultural land cover type, covered 17.4% totaling 3,921.5 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 29.1% or 6,573.5 acres. There were no land cover polygons classified in either the Non-vascular or Sparse vegetation categories. Forests contributed the greatest acreage in the natural and semi-natural land cover type categories,

covering 2,392.4 acres or 10.7%. 1,731 acres, or 72.4% of the 2,392.4 acres of Forest are classified as “Upland Deciduous Forest” while the remaining 27.5% is deciduous forest on hydric soils. Of the 72.4% (1,731 acres) of upland deciduous forest, 56.7% (980.5 acres) is classified as “Altered/non-native”, 24.4% (422.3 acres) is “Maple-Basswood Forest”, and 19.0% (328.3 acres) is “Oak forest mesic subtype”. Of the 27.5% (657.8 acres) of deciduous forests on hydric soils 14.4% (94.7 acres) are “Lowland Hardwood Forest”, 0.0% (0.2 acres) are “Mixed Hardwood Swamp” and the remaining 85.5% (562.9 acres) is “Altered/non-native Deciduous Forest” of various hydrological regimes. “Woodlands” or open stands of trees with non-touching crowns and “Shrublands” are both small components contributing only 0.3% (67.1 acres) and 0.6% (136.9 acres) respectively to the total land cover. The “Woodlands” category is made up entirely of “Altered non-native” categories. The “Herbaceous” cover type is the third largest category by area in the natural to semi-natural categories with 2,037.8 acres (9.0 %). 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. The “Herbaceous” category is primarily comprised of non-native dominated communities with “Temporarily flooded, Saturated, Seasonally flooded, and Semi-permanently flooded altered/non-native dominated vegetation” making up 95.8% of the total herbaceous area. “Water”, the second largest natural and semi-natural category, covered 8.6% or 1,939.3 acres. “Plastron and Limonite Open Water” comprised 99.7% (1,932.7 acres) of the water cover types.

The following maps provide Level 1 (General) and Level 3 (Refined) representations of MLCCS findings. Note the extent to which undeveloped areas of the northwest remain as both agricultural and woodlots, as well as the extent to which open space (natural and semi-natural coverages, >30XXX) within the city is dominated by a few large tracts of forest, mostly (but not entirely) in public ownership and herbaceous coverages, which are almost exclusively wetlands.

Land Cover Classification - Level 1

City of Plymouth Land Cover Classification and Natural Resources Inventory

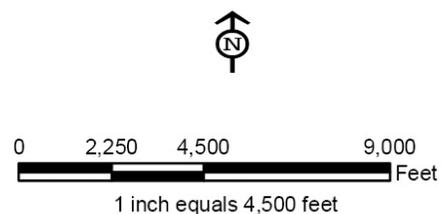
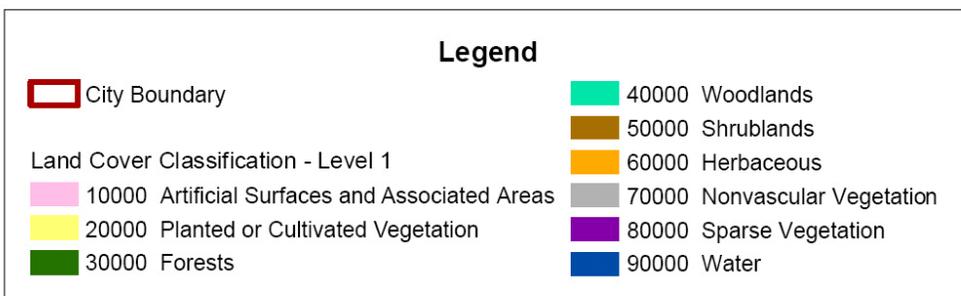
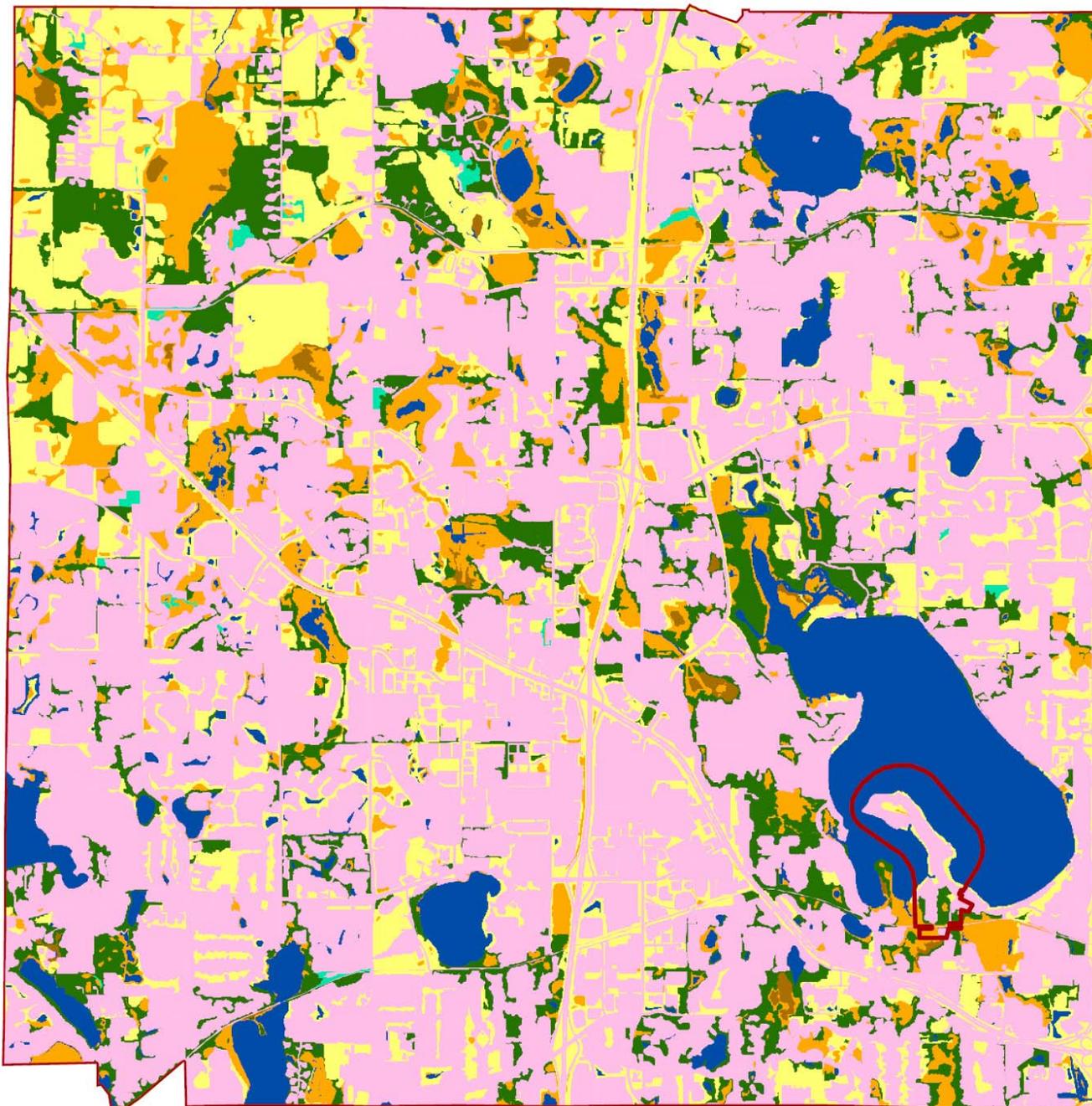
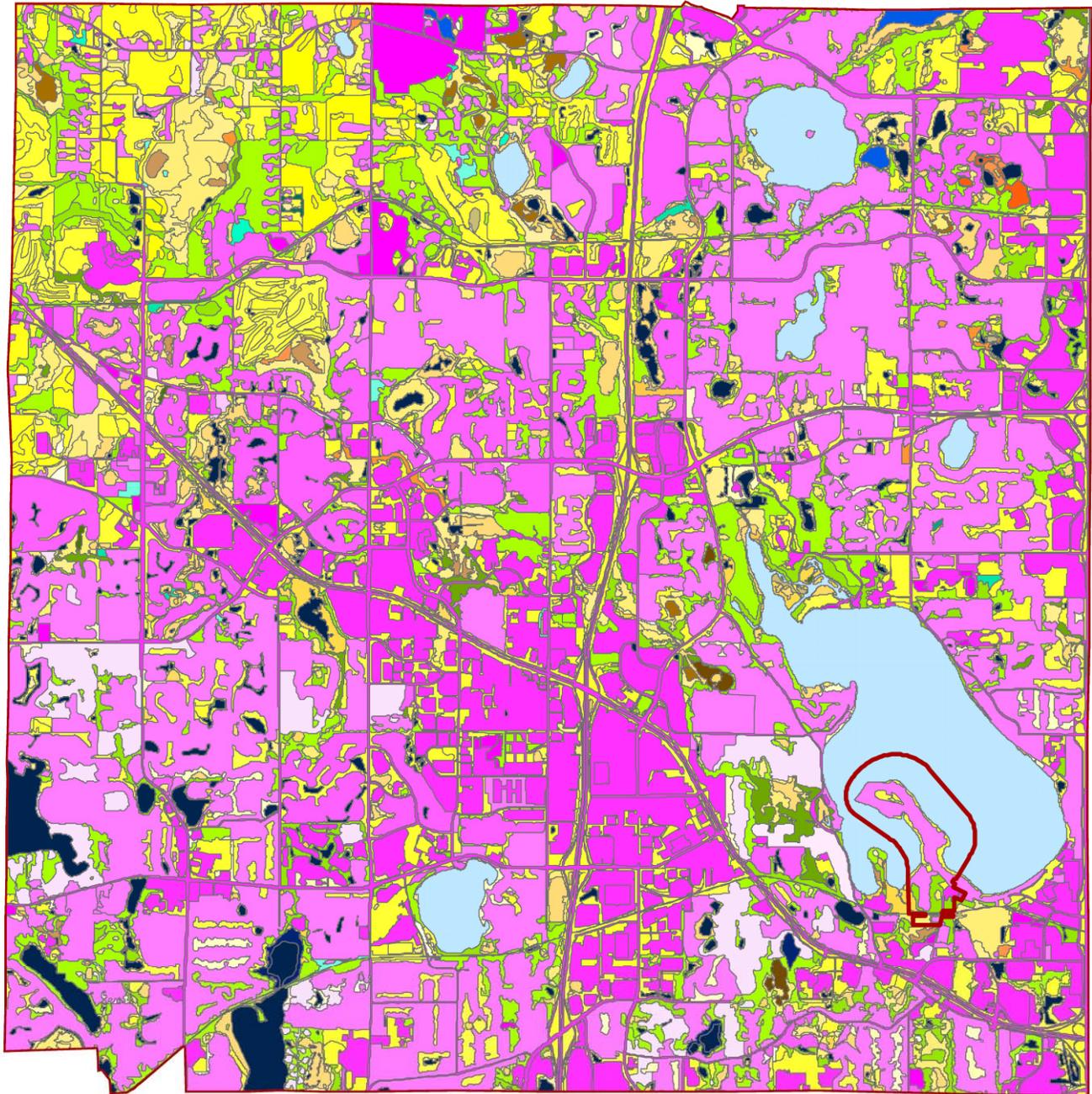


Figure 6

Land Cover Classification - Level 3

City of Plymouth 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



0 2,250 4,500 9,000
 Feet
 1 inch equals 4,500 feet

* Complete Level 3 Legend on next page.

Figure 7

Legend for Level 3 Land Cover Classification

- | | |
|--|--|
| <p>10000 ARTIFICIAL SURFACES AND ASSOCIATED AREAS</p> <ul style="list-style-type: none"> 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 <p>20000 PLANTED OR CULTIVATED VEGETATION</p> <ul style="list-style-type: none"> 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 <p>30000 FORESTS</p> <ul style="list-style-type: none"> 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 <p>40000 WOODLANDS</p> <ul style="list-style-type: none"> Upland coniferous woodland Upland deciduous woodland Temporarily flooded deciduous woodland Saturated deciduous woodland Seasonally flooded deciduous woodland Upland mixed coniferous-deciduous woodland <p>50000 SHRUBLANDS</p> <ul style="list-style-type: none"> Saturated needle-leaved or microphyllous evergreen dwarf-shrubland Upland deciduous shrubland Temporarily flooded deciduous shrubland | <ul style="list-style-type: none"> Saturated deciduous shrubland Seasonally flooded deciduous shrubland Semipermanently flooded deciduous shrubland <p>60000 HERBACEOUS</p> <ul style="list-style-type: none"> 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 <p>70000 NONVASCULAR VEGETATION</p> <ul style="list-style-type: none"> Lichen vegetation with sparse tree layer <p>80000 SPARSE VEGETATION</p> <ul style="list-style-type: none"> 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 <p>90000 WATER</p> <ul style="list-style-type: none"> 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

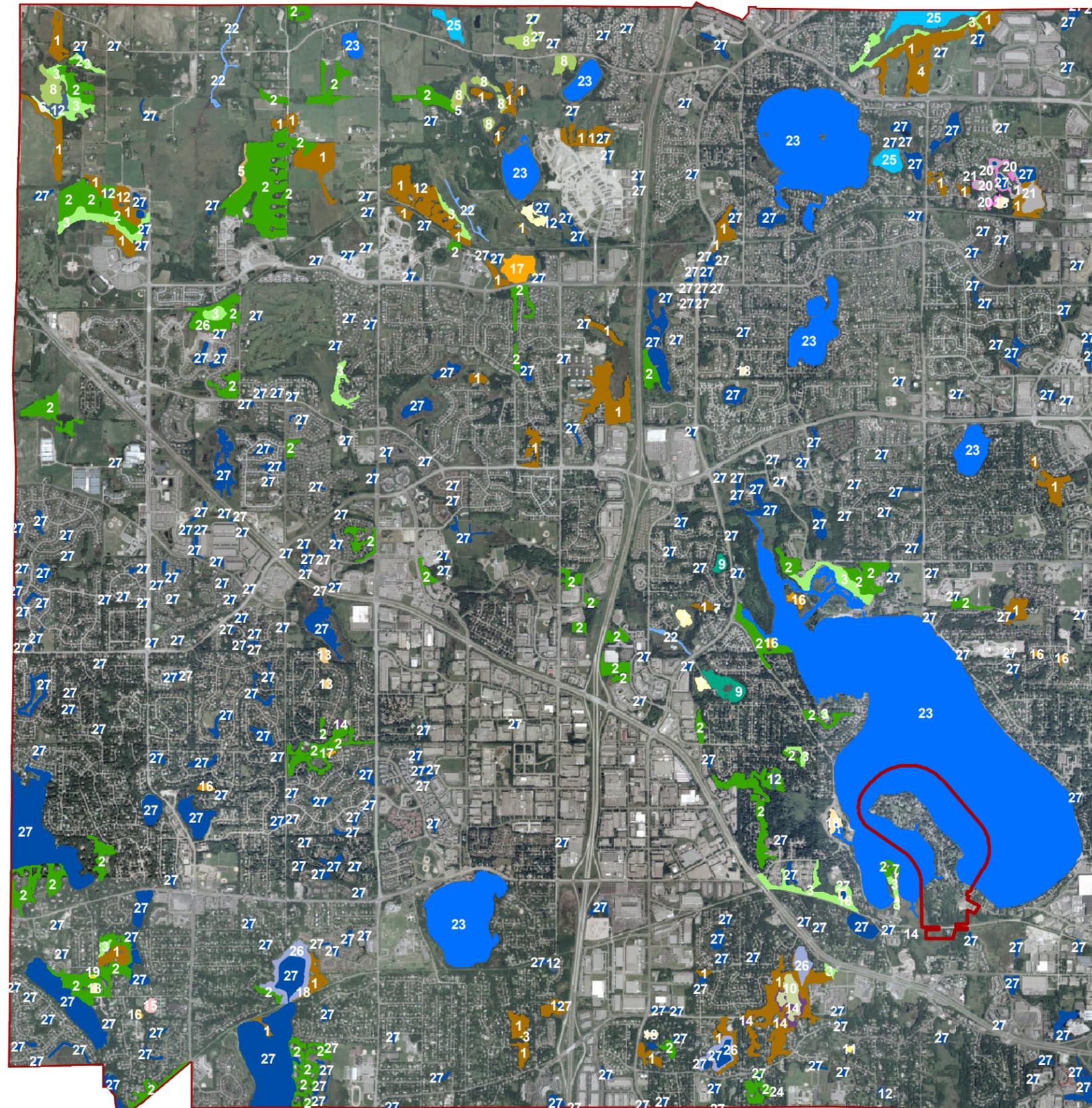
Within the City of Plymouth, 162 individual natural communities were identified (not including water), representing a total of 981 Acres. During the photo interpretation process, more than 1400 terrestrial natural and semi-natural areas were identified. Those landscape areas deemed in the field to be 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 162 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. 20 distinct terrestrial (not including open water) natural community types were identified. The following chart provides a breakdown of total terrestrial natural areas identified within the City of Plymouth.

Community Description	Field Code	Total Acres	Ranked Natural Areas	Min. Size (Acres)	Max. Size (Acres)
Mesic Oak Forest	32112	328.25	39	0.49	41.11
Maple-Basswood Forest	32150	403.61	48	0.68	69.77
Lowland Hardwood Forest	32220	90.27	16	0.21	15.66
Mixed Hardwood Swamp	32320	3.68	2	0.57	3.11
Willow Swamp - Saturated	52360	1.46	1	1.46	1.46
Wet Meadow, Shrub Subtype	52420	11.46	5	0.26	4.87
Willow Swamp - Seasonally Flooded	52430	35.21	7	1.91	10.00
Willow Swamp - Semipermanently Flooded	52520	13.81	2	2.89	10.92
Big birch - <i>Spiraea</i> Meadow	52530	10.53	1	10.53	10.53
Wet Meadow, Temporarily Flooded	61320	0.51	1	0.51	0.51
Wet Meadow - Saturated	61420	13.90	9	0.25	5.50
Mixed Emergent Marsh - Seasonally Flooded	61520	2.86	2	0.92	1.94
Wet Meadow - Seasonally Flooded	61540	10.09	6	0.15	7.93
Cattail Marsh - Semipermanently Flooded	61610	2.21	1	2.21	2.21
Mixed Emergent Marsh - Semipermanently Flooded	61620	7.10	7	0.28	2.26
Wet Meadow - Semipermanently Flooded	61640	13.74	2	0.47	13.27
Wet Meadow Floating Mat Subtype	61641	10.79	8	0.33	3.76
Mixed Emergent Marsh - Intermittently Exposed	61720	0.33	1	0.33	0.33
Mixed Emergent Marsh - Permanently Flooded	61820	3.74	2	1.21	1.31
Water Lily Open Marsh	64111	14.72	1	14.72	14.72
TOTAL		978.27	162		

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

Natural Areas and Community ID Numbers

City of Plymouth Land Cover Classification and Natural Resources Inventory



Legend

- City Boundary
- Natural Community Type
- 1 Oak forest mesic subtype
- 2 Maple-basswood forest
- 3 Lowland hardwood forest
- 4 Black ash swamp
- 5 Mixed hardwood swamp
- 6 Willow swamp - saturated soils
- 7 Wet meadow shrub subtype
- 8 Willow swamp
- 9 Willow swamp - semipermanently flooded
- 10 Birch bog, spiraea shrubland - semipermanently flooded
- 11 Wet meadow - temporarily flooded soils
- 12 Wet meadow
- 13 Mixed emergent marsh - seasonally flooded
- 14 Wet meadow - seasonally flooded
- 15 Cattail marsh - semipermanently flooded
- 16 Mixed emergent marsh
- 17 Wet meadow - semipermanently flooded
- 18 Wet meadow floating mat subtype
- 19 Mixed emergent marsh - intermittently exposed
- 20 Mixed emergent marsh - permanently flooded
- 21 Water lily open marsh
- 22 Slow moving linear open water habitat
- 23 Limnetic open water
- 24 Floating vascular vegetation - semipermanently flooded littoral aquatic bed
- 25 Littoral open water
- 26 Floating vascular vegetation
- 27 Palustrine open water



Figure 8

NATURAL COMMUNITY AREAS

The following are descriptions of the land cover types 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 / 39 occurrences, 328.3 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 understory. 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.



Mixed Aged **Mesic Oak Forest** on private backyards in Plymouth

Maple-basswood forest (MLCCS Code 32150 / 48 occurrences, 403.61 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



Diverse forest floor species in a Maple Basswood Forest in Plymouth.

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



Deep shade sugar maple dominated Maple Basswood Forest with forest floor dominated by maple saplings.

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 are five recognized sections of Maple-Basswood Forest (Southeast, Big Woods, East Central, West Central, and Northern). Subtypes likely will be recognized along a moisture gradient, following analysis of plot data.

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.

Lowland hardwood forest (MLCCS Code 32220 / 16 occurrences, 90.27 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.

Mixed hardwood swamp (MLCCS Code 32320/ 2 occurrences, 3.7 Acres) - A forest with saturated hydrology, growing on muck or shallow peat. Tree cover is >30%, of which <50% is black ash and <50% is tamaracks, white cedars, and black spruces combined. Mn

DNR Natural Heritage description: Mixed Hardwood Swamp is present in the deciduous forest-woodland and conifer-hardwood forest zones. The community has a mixed canopy of hardwoods, including paper birches, yellow birches, American elms, black ashes, red maples, quaking aspens, and green ashes. Black ashes, although commonly present, never form more than 50% of the canopy cover in the community. Tamarack or white pine are also occasionally co-dominant canopy tree species. The tree canopy cover ranges from sparse to dense, with the density of the shrub cover varying inversely with the density of the tree canopy. Mixed Hardwood Swamp occurs most commonly on muck and shallow peat on lake plains and floodplains. It is a long-lived community and has old-growth potential. Like Black Ash Swamp, Mixed Hardwood Swamp varies considerably in its composition across Minnesota. The descriptions below are for specific areas for which information exists. On the Anoka Sand Plain, Mixed Hardwood Swamp is common in shallow wetlands, especially near upland margins. On sites that are not too wet, Mixed Hardwood Swamp may succeed minerotrophic Alder Swamp. Common canopy dominants on the Sandplain are tamaracks, paper birches, red maples, yellow birches, and black ashes. Occasionally, white pines form a patchy supercanopy above the hardwood canopy. Speckled alders and poison sumacs are the most common shrubs. Other associated species are interrupted fern (*Osmunda claytoniana*), mad-dog skullcap (*Scutellaria lateriflora*), marsh marigold (*Caltha palustris*), the sedge *Carex stipata*, and mosses, including some sphagnum hummocks. Mixed Hardwood Swamps on the Anoka Sandplain harbor two rare plant species, halberd leaved tearthumb (*Polygonum arifolium*) and yellow bartonia (*Bartonia virginica*). Mixed Hardwood Swamp is perhaps the most species rich community in east-central Minnesota.

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

Upland deciduous Shrubland (MLCCS Code 52100) - 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).

Saturated deciduous shrubland (MLCCS Code 52300) - Surface water is seldom present, but substrate is saturated to surface for extended periods during the growing season.

Willow swamp - saturated soils (MLCCS Code 52360/ 1 occurrence, 1.5 Acres)– Vegetation on saturated soils (but not seepage) 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.

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 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/ 5 occurrences, 11.5 Acres) – A wetland with 50-70% cover by tall shrubs (not dominated by bog birch (*Betula pumila*), meadowsweet (*Spiraea alba*), or steplebush (*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/ 7 occurrences, 35.2 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.

Semipermanently flooded deciduous shrubland (MLCCS Code 52500)– 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.

Willow swamp – Semipermanently flooded (MLCCS Code 52520/ 2 Occurrences, 13.8 Acres) – A native species shrubland in a semipermanently flooded basin with <30% tree cover. See “Willow swamp – seasonally flooded” for description.

Bog birch, spiraea swamp – semipermanently flooded (MLCCS Code 52530/ 1 Occurrence, 10.5 Acres)– A floating shrubland in a semipermanently flooded basin that is dominated by bog birch (*Betula pumila*), meadowsweet (*Spiraea alba*), or steeplebush (*Spiraea tomentosa*).

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.

Temporarily flooded grassland (MLCCS Code 61300)- Surface water present for brief periods during growing season, but water table usually lies well below soil surface. Often characterizes flood-plain wetlands.

Wet meadow – temporarily flooded soils (MLCCS Code 61320/ 1 Occurrence, 0.5 Acres)– A wetland on temporarily flooded soils with <30% tree cover and <50% shrub cover and NOT dominated by prairie species or non-native species. Mn DNR Natural Heritage description: Wet Meadow is present throughout Minnesota. The 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.

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.

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/ 9 Occurrences, 13.9 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”.

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/ 2 Occurrences, 2.9 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.

Wet meadow – seasonally flooded (MLCCS Code 61540/ 6 Occurrences, 10.1 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.

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.

Cattail marsh (MLCCS Code 61610/ 1 Occurrence, 2.2 Acres)– A wetland on semipermanently flooded soils with <30% tree cover and <50% shrub cover and dominated by cattails, but even when they form a monotypic canopy there is still fairly high plant diversity. Mn DNR Natural Heritage description: Cattail Marsh is an emergent marsh dominated by cattails (including *Typha angustifolia*, *T. latifolia*, and their hybrids). It occurs most commonly along lake margins and in shallow basins, although it is sometimes also present in river backwaters. Lacustrine cattail marshes typically have a muck-bottom zone bordering the shoreline, where cattails are rooted in the bottom substrate, and a floating mat zone, where the roots do not contact the bottom but instead the plants grow suspended in a buoyant peaty mat. Associated species vary widely, but some of the most common ones are sedges of the genus *Carex* (*C. aquatilis*, *C. rostrata*, and *C. languinosa*), bulrushes (*Scirpus americanus*, *S. acutus*, and *S. heterochaetus*), and broad-leaved herbs such as northern

marsh fern (*Thelypteris palustris*), swamp milkweed (*Asclepias incarnata*), jewel-weed (*Impatiens capensis*), broad-leaved arrowhead (*Sagittaria latifolia*), mad-dog skullcap (*Scutellaria lateriflora*), marsh skullcap (*Scutellaria galericulata*), and blue vervain (*Verbena hastata*).

Mixed emergent marsh – semipermanently flooded (MLCCS Code 61620/ 7 Occurrences, 7.1 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.

Wet meadow – semipermanently flooded (MLCCS Code 61640/ 2 Occurrences, 13.7 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*.

Wet Meadow, floating mat subtype (MLCCS Code 61641/ 8 Occurrences, 10.8 Acres)– 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.



Intermittently exposed emergent vegetation (MLCCS Code 61700)–

Surface water is present throughout the year except in years of extreme drought.

High quality **Wet Meadow, floating mat subtype** (MLCCS Code 61641) in an isolated wetland basin. Dominated by sedge species, Marsh fern, wetland shrubs and flowers, invasive, non-native species persist only at the margins in mineral soils.

Mixed emergent marsh – intermittently exposed (MLCCS Code 61720/ 1 Occurrence, 0.3 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 “mixed emergent marsh – seasonally flooded” for description.

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/ 2 Occurrences, 3.7 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.

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/ 1 Occurrences, 14.7 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*.

Slow moving linear open water habitat (MLCCS Code 91100/ 4 Occurrences, 6.5 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.

Limnetic Open Water (MLCCS Code 92100/ 8 Occurrences, 1342.9 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/ 1 Occurrence, 0.1 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.

Littoral Open water (MLCCS Code 92500/ 3 Occurrences, 36.6 Acres) – Open water >8 hectares (20 acres) with <25% vegetative cover NOT in a channel (or in a channel where flow is not visible due to damming), where water depth is <2 meters (6.6 feet) at times of low water. Cowardin defines these wetland habitats as extending from the shoreward boundary of the system to a depth of 6.6 feet (2 meters) below low water or to the maximum extent of non-persistent emergents, if these grow at depths greater than 6.6 feet.

Permanently flooded aquatic bed (MLCCS Code 93200/ 4 Occurrences, 28.8 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) – 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/ 331 Occurrences, 655.5 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 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”. However, 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 developed a series of Conceptual Natural Resources/Open Space Corridors shown in the figure on the following page. These corridors were developed primarily with the following guiding elements, listed in rough order of priority:

- High and Moderate quality natural areas
- Other unique and/or ecologically significant areas
- Riparian areas including bodies of water and wetland complexes
- Natural corridors with natural/semi-natural areas (e.g. streams, drainage ways, ridges)
- Connectivity to surrounding communities in identified natural corridors/greenways
- 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 and are indeed conceptual. 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 Plymouth and other important stakeholders to undertake a more comprehensive process of defining and locating potential open space corridors. Such a process will allow

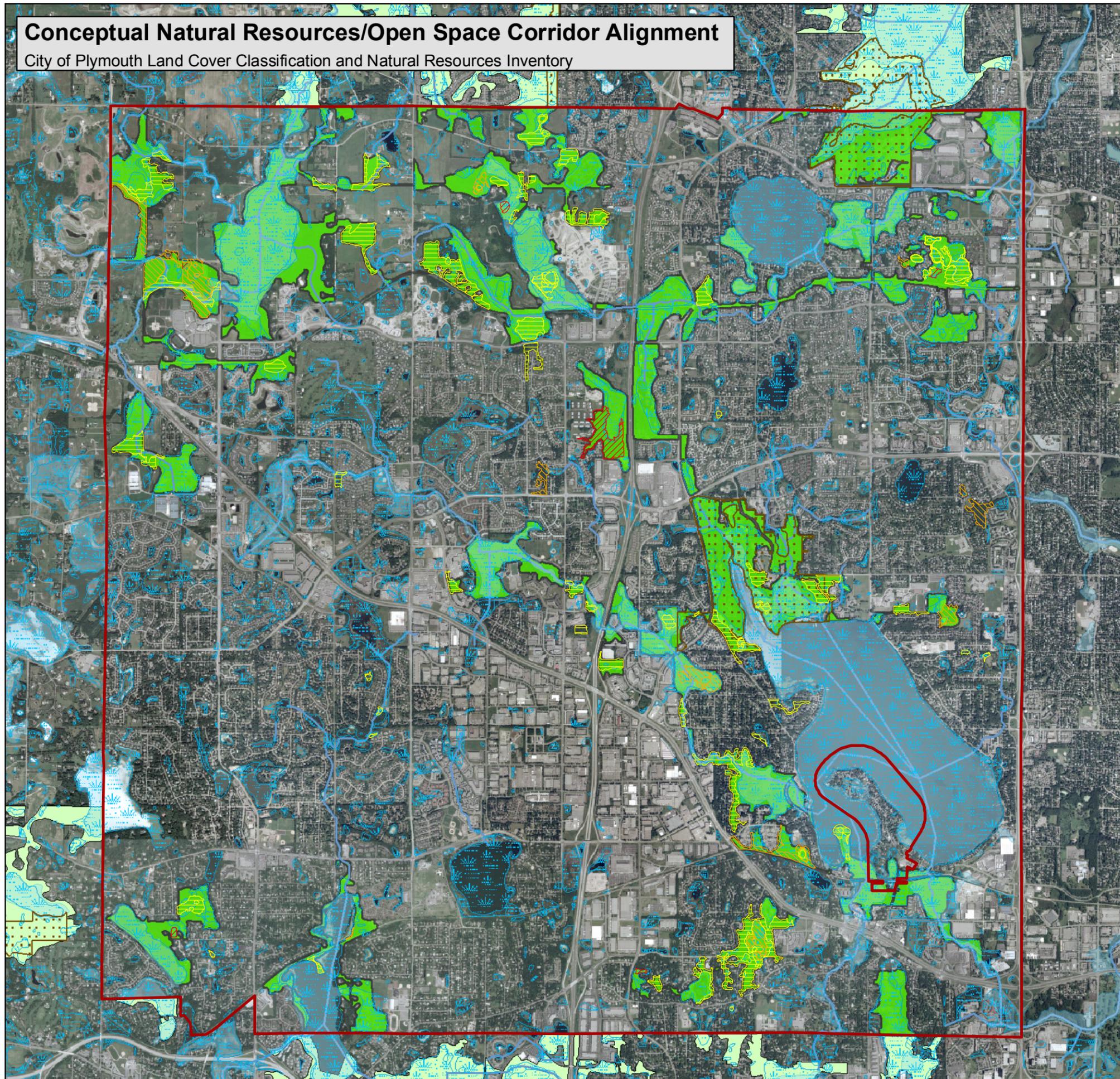
for public input and technical guidance from experienced staff in the natural resources field, ensuring long term acceptance of a final product.

Based on the analysis provided in Figure 9, linkages between large blocks of natural lands surrounding Medicine Lake and undeveloped/farmed/natural lands to both the northwest and northeast appear very promising. Trails are in place along the Medicine Lake/French Regional Park portion of this corridor, and if planned in conjunction with the build-out of undeveloped areas, Plymouth retains great potential for the preservation and connection of remaining natural areas.

Additionally, the Luce Line Trail (beginning in Plymouth south of Medicine Lake and running along an east-west corridor in the southern part of the city) is in place. The analysis did not clearly pull up this corridor as a strong open space corridor candidate largely due to a portion that runs through an established industrial area and because most of the forested portions of this trail are in a semi-natural state. However, it's ownership is in public hands, and with targeted natural areas management of it's boundaries, this corridor should also be considered for it's greenway potential keeping in mind that numerous ranked natural areas are located either on or near this corridor.

Conceptual Natural Resources/Open Space Corridor Alignment

City of Plymouth Land Cover Classification and Natural Resources Inventory



Legend

- City Boundary
- Regional Parks
- Adjacent Greenway Corridors
- Conceptual Greenway Corridor

- Streams
- 100 Year Floodplain
- Existing Wetlands

Natural Community Quality

- High Quality
- Good Quality
- Moderate Quality

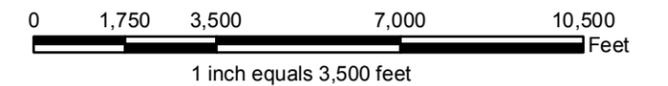


Figure 9

In establishing an open space corridor planning process, The City of Plymouth should 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** – Plymouth is a mostly urbanized setting with a few large blocks of natural and semi-natural areas remaining and a number of isolated high quality natural areas. Priority should be placed on the preservation of the highest quality remnant natural areas within the city through the establishment of monitoring, conservation plans and management of the highest quality natural areas that remain. While five of the six sites given a high quality ranking are wetlands and already receive some legal protection, they may be threatened by activities that occur at their edges. Establishment of buffer areas to protect the highest quality areas from adjacent land use 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).
- **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 natural communities, but care should be taken to manage invasive species along these corridors. Semi-natural communities can act as conduits for both desirable native species as well as non-native invasive species.
- **Encourage Citizen Stewardship of Private Natural Areas** - Plymouth 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 Forest Management: Image on left is Mesic Oak Forest one year after buckthorn clearing by residents (now a B quality ranking). Mature White and Red Oak dominate overstory with native shrub and ground layer vegetation regenerating. Adjacent property (D quality ranking) with buckthorn dominant in ground, shrub and understory layers.

- Restore Natural Areas – Most of Plymouth 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 natural 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 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 – Plymouth has an extensive trail network that includes local city trails for bicycles and pedestrians as well as two major regional trails, one fully in place (Luce Line Trail), and one partially in place (Medicine Lake/French Park Trail). These trails and others could be used to 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.



Rail corridors form obvious long linear corridors, often containing remnant natural areas at their edges. Care should be taken when using rail corridors as greenway connections in order to limit the abundance and movement of invasive species.

The City of Plymouth has numerous opportunities to develop a viable open space corridor system both within the developed core as well as the developing northwest. The essential part of the open space corridor system equation is to develop goals and plans for the establishment of such a system while the opportunities still exist.

NATURAL AREAS WITH POTENTIAL FOR RARE SPECIES

Within the City of Plymouth, 162 sites were determined to meet “Natural Area” quality with 25 given a rank of A (high) or B (moderate) quality. These areas have the greatest potential to harbor rare plant species. Because budget did not allow for full rare species inventories, targeted searches were not conducted as a part of Natural Resources inventory process. Great River Greening staff ecologists noted no instances of listed rare species within Plymouth during the 2006 surveys in the collection of plant community data. It should be noted that the MLCCS survey protocol did not specifically focus on rare species, and time was not available within budget to spend on in depth species searches. It is recommended that the City of Plymouth consult an experienced plant ecologist to determine whether proposed development activities warrant additional rare species inventories on natural/semi-natural areas.

The following are lists of rare plant species, by habitat type identified in surveys, that Great River Greening ecologists believe could potentially occur in the City of Plymouth. It should be noted that this list is not an all-inclusive list of state listed species. That list is available from the Minnesota DNR on-line at: <http://www.dnr.state.mn.us/ets/index.html>

Oak/ Maple Basswood/ Upland Deciduous Forest:

Handsome sedge *Carex formosa* Endangered
Plantain-leaved sedge *Carex plantaginea* Endangered
Big tick-trefoil *Desmodium cuspidatum* Special Concern
Stemless tick-trefoil *Desmodium nudiflorum* Special Concern
Goldie’s fern *Dryopteris goldiana* Special Concern
Ginseng *Panax quinquefolius* Special Concern

Wet Meadow:

Marginated rush *Juncus marginatus* Special Concern
Small white lady’s slipper *Cypripedium candidum* Special Concern
Club-spur orchid *Platanthera clavellata* Endangered

Mixed Emergent Marsh:

Water willow *Decodon verticillatus* Special Concern
Walter’s barnyard grass *Echinochloa walteri* Tracked by DNR (Non-listed)

Cattail Marsh:

Water willow *Decodon verticillatus* Special Concern

Figure 10 shows targeted communities (from previous chart) of moderate to high ranking natural areas with potential for rare species.

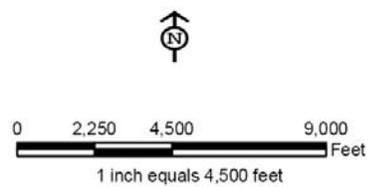
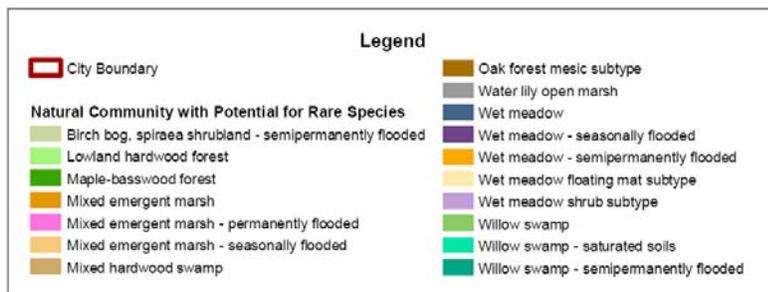
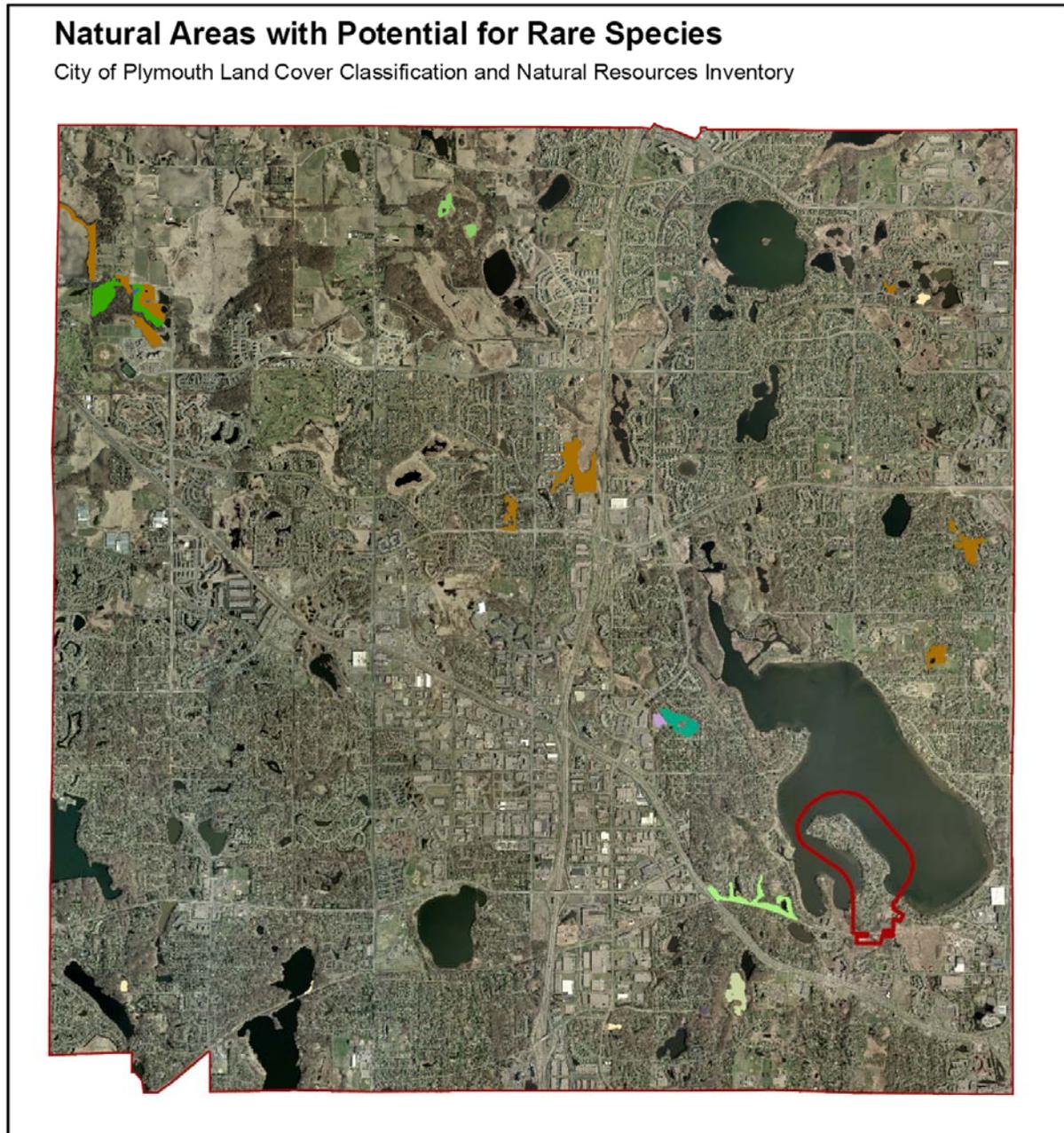


Figure 10

NATURAL AREAS ACTIVE MANAGEMENT/PROTECTION RECOMMENDATIONS

The City of Plymouth is nearly completely urbanized at the time of this report. The six square miles (sections) in the northwest corner represent the final remaining large, contiguous portions of the city still largely in farmland or in a natural/semi-natural state. There are, however, numerous remnant natural areas spread throughout the city that warrant attention for their relative ecological integrity. Out of the 36 square miles sections that constitute the City of Plymouth, 30 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. This MLCCS analysis did not examine which of these lands are publicly or privately owned, and which are in active management, but based on surveys, each of the above conditions exist. We suggest that this analysis be undertaken using the new data provided by this MLCCS mapping. Great River Greening ecologists encountered many 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 Plymouth 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 Plymouth 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 Plymouth 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 areas from adjacent land uses, to include controlling weed species as well as protection of water resources entering in tact sites
- Management of invasive species in corridors to limit expansion of these species into natural areas

Following the establishment of an Open Space Plan, the City should consider which remaining parcels of land (particularly forests in Plymouth) to acquire as the final portions of the city are developed. 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 the protecting/acquiring the highest quality sites and the largest contiguous blocks of remaining natural forest lands. The city of Plymouth should establish guidelines for acquisition that fits 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
- Rarity of a vegetation type/community 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, Duck Unlimited, Great River Greening and Foundations, etc. Finally, private citizens can also be 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 of 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, the though 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.

The following two general landscape types provided the greatest number of high quality natural areas remaining within the City of Plymouth. The following two sections provide basic guidance ideas for approaching the protection of these resources.

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 Plymouth, probably the greatest impact to wetlands is alteration of hydrology, pollutant loading and encroachment of adjacent plant species in surrounding developments and agricultural lands.

Plymouth contains many remnant natural wetlands that should receive focused protection efforts. In very few cases are these wetlands threatened by outright destruction, 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 Plymouth should retain, strengthen and adopt ordinances and incentives for citizens and developers to:

- Carefully consider the effects of any hydrologic alteration (either increases or decreases) of natural wetland communities.
- Acquire, create, retain and incentivize buffers to protect wetland 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.

Forests – Pre-settlement Plymouth was generally a mix of Oak Barrens, Oak Forest and Maple Basswood Forest. The largest areas and largest number of ranked natural areas identified during the MLCCS process were Oak Forest and Maple-Basswood Forest. These forest types currently exist on both public and private lands. Most of the forests in Plymouth have been subject to past human disturbances including logging, homebuilding, grazing, trail building and other activities. Currently, many of these forests have regenerated into structurally rich and diverse plant communities. Others suffer from fragmentation, invasion by non-native invasive species and overuse. Many forests have become dominated with invasive shrubs. 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 Plymouth should establish guidelines to protect remaining intact natural 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, regular shapes
- Link existing natural forests through managed corridor planning

- Provide landowner incentives for sound forest management
- Create a plan for targeted invasive species control

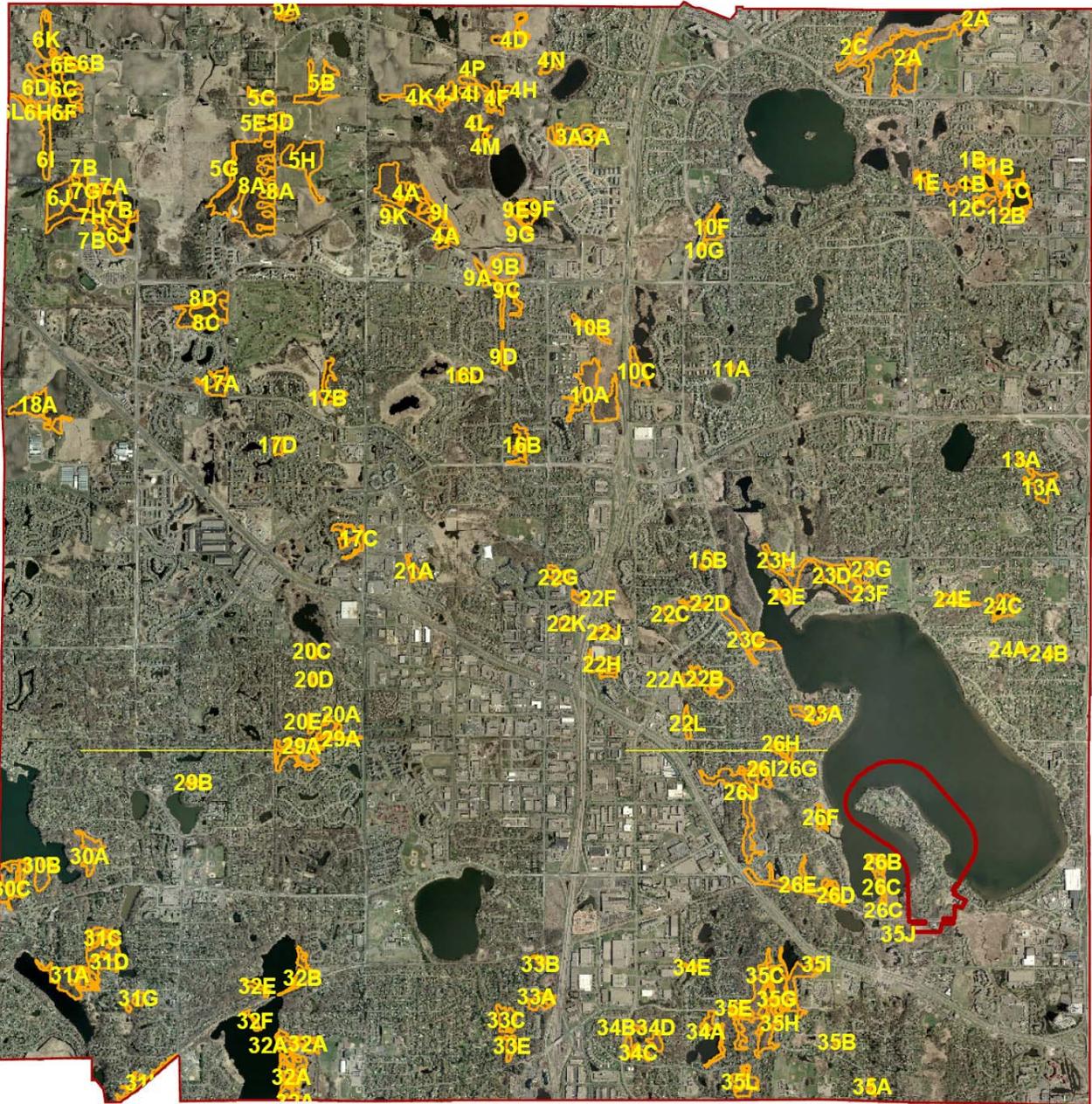
NATURAL AREAS IDENTIFIER MAP AND SITE DESCRIPTIONS

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 63.

Species List Identification Numbers

City of Plymouth Land Cover Classification and Natural Resources Inventory



Legend

-  City Boundary
-  Species List - Community ID

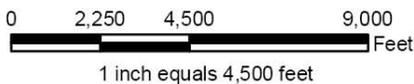


Figure 11

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- 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.
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- 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	12,084.5	628
20000	Planted or Cultivated Vegetation (greater than 96% vegetation cover)	3,921.5	1,131
30000	Forests	2,392.4	578
40000	Woodland	67.1	24
50000	Shrubland	136.9	42
60000	Herbaceous	2,037.8	801
70000	Nonvascular vegetation	-	0
80000	Sparse vegetation	-	0
90000	Water	1939.3	351
Totals:		22,579.5	3555

Level 3 Land Cover Summary			
MLCCS Code	Description	Total Acres	# of Polygons
10xxx			
11100	Artificial surfaces with coniferous trees	41.8	1
11200	Artificial surfaces with deciduous tree cover	549.8	26
11300	Artificial surfaces with mixed coniferous and deciduous tree cover	4.9	1
13100	Artificial surfaces with perennial grasses with sparse trees	5,606.6	187
13200	Artificial surfaces with perennial grasses	1,884.6	94
14100	Buildings and/or pavement	3,725.2	287
14200	Exposed earth	271.8	32
	<i>Subtotal:</i>	12,084.5	628
20xxx			
21100	Planted, maintained or cultivated coniferous trees	42.7	31
21200	Planted, maintained or cultivated deciduous trees	170.2	54
21300	Planted, maintained or cultivated coniferous and deciduous trees	59.5	14
23100	Planted or maintained grasses with sparse tree cover	1,191.0	361
23200	Planted or maintained grasses	1,923.8	578
23300	Planted or maintained grasses or forbs	65.3	11
24100	Row cropland	257.1	45
24200	Close grown or solid seeded cropland	211.8	37
	<i>Subtotal:</i>	3,921.5	1131
30xxx			
32100	Upland deciduous forest	1,731.0	380
32200	Temporarily flooded deciduous forest	523.5	155
32300	Saturated deciduous forest	132.1	38
32400	Seasonally flooded deciduous forest	5.8	5
	<i>Subtotal:</i>	2,392.4	578
40xxx			
42100	Upland deciduous woodland	29.9	11
42200	Temporarily flooded deciduous woodland	13.2	4
42300	Saturated deciduous woodland	16.4	6
42400	Seasonally flooded deciduous woodland	3.8	2
43100	Upland mixed coniferous-deciduous woodland	3.8	1
	<i>Subtotal:</i>	67.1	24

Level 3 Land Cover Summary			
MLCCS Code	Description	Total Acres	# of Polygons
50xxx			
52100	Upland deciduous shrubland	5.2	4
52200	Temporarily flooded shrubland	7.4	3
52300	Saturated deciduous shrubland	50.2	17
52400	Seasonally flooded deciduous shrubland	49.8	15
52500	Semipermanently flooded deciduous shrubland	24.3	3
	<i>Subtotal:</i>	136.9	42
60xxx			
61100	Tall grassland	3.2	3
61200	Medium-tall grassland	2.8	2
61300	Temporarily flooded graminoid vegetation	116.6	49
61400	Saturated graminoid vegetation	535.1	188
61500	Seasonally flooded emergent vegetation	647.2	230
61600	Semipermanently flooded emergent vegetation	479.0	195
61700	Intermittently exposed emergent vegetation	78.4	59
61800	Permanently flooded emergent vegetation	85.9	49
62100	Grassland with sparse deciduous trees	17.8	6
62300	Temporarily flooded grassland with sparse deciduous trees	25.3	8
62400	Saturated grassland with sparse deciduous trees	31.7	10
64100	Standing water hydromorphic rooted vegetation	14.7	2
	<i>Subtotal:</i>	2,037.8	801
90xxx			
91100	Slow moving linear open water habitat	6.5	4
92100	Limnetic open water	1,211.7	8
92200	Semipermanently flooded littoral aquatic bed	0.1	1
92500	Littoral open water	36.6	3
93200	Permanently flooded aquatic bed	28.8	4
93300	Palustrine open water	655.5	331
	<i>Subtotal:</i>	1,939.3	351
Totals:		22,579.5	3,555

Level 5 Land Cover Summary			
MLCCS Code	Description	Total Acres	# of Polygons
11134	Eastern red cedar (woodland) with 26-50% impervious cover	41.8	1
11223	Maple-basswood (forest) with 11- 25% impervious cover	69.5	3
11229	Other deciduous trees with 11- 25% impervious cover	12.3	4
11231	Oak (forest or woodland) with 26-50% impervious cover	11.7	2
11233	Maple-basswood (forest) with 26-50% impervious cover	177.0	6
11234	Boxelder-green ash (forest) with 26-50% impervious cover	20.6	1
11239	Other deciduous trees with 26-50% impervious cover	218.7	7
11241	Oak (forest or woodland) with 51-75% impervious cover	21.6	1
11243	Maple-basswood (forest) with 51-75% impervious cover	10.6	1
11249	Other deciduous trees with 51-75% impervious cover	8.0	1
11314	Planted mixed coniferous/deciduous trees with 4-10% impervious cover	4.9	1
13114	Short grasses and mixed trees with 4-10% impervious cover	10.4	3
13120	11% to 25% impervious cover with perennial grasses and sparse trees	4.3	2
13124	Short grasses and mixed trees with 11-25% impervious cover	162.1	38
13125	Long grasses and mixed trees with 11-25% impervious cover	5.9	1
13130	26% to 50% impervious cover with perennial grasses and sparse trees	1.7	1
13134	Short grasses and mixed trees with 26-50% impervious cover	4,468.9	115
13144	Short grasses and mixed trees with 51-75% impervious cover	953.3	27
13211	Short grasses with 4-10% impervious cover	7.6	2
13221	Short grasses with 11-25% impervious cover	43.4	12
13230	26% to 50% impervious cover with perennial grasses	33.0	1
13231	Short grasses with 26-50% impervious cover	443.6	17
13240	51% to 75% impervious cover with perennial grasses	7.8	2
13241	Short grasses with 51-75% impervious cover	1,349.2	60
14112	Pavement with 76-90% impervious cover	68.0	11
14113	Buildings and pavement with 76-90% impervious cover	1,436.2	90
14121	Buildings with 91-100% impervious cover	98.9	19
14122	Pavement with 91-100% impervious cover	1,138.1	39
14123	Buildings and pavement with 91-100% impervious cover	984.0	128
14214	Other exposed/transitional land with 0-10% impervious cover	205.7	25
14224	Other exposed/transitional land with 11-25% impervious cover	61.1	5
14234	Other exposed/transitional land with 26-50% impervious cover	5.1	2

Level 5 Land Cover Summary			
MLCCS Code	Description	Total Acres	# of Polygons
21110	Upland soils with planted, maintained, or cultivated coniferous trees	9.1	5
21111	Spruce/fir trees on upland soils	17.9	15
21112	White pine trees on upland soils	0.3	1
21113	Red pine trees on upland soils	1.4	1
21114	Coniferous trees on upland soils	14.1	9
21213	Deciduous trees on upland soils	170.2	54
21310	Upland soils with planted, maintained or cultivated mixed coniferous/deciduous trees	59.5	14
23111	Short grasses with sparse tree cover on upland soils	913.8	273
23112	Long grasses with sparse tree cover on upland soils	224.6	73
23121	Short grasses with sparse tree cover on hydric soils	44.8	7
23122	Long grasses with sparse tree cover on hydric soils	7.9	8
23211	Short grasses on upland soils	895.7	239
23212	Long grasses on upland soils	865.6	282
23221	Short grasses on hydric soils	101.6	38
23222	Long grasses on hydric soils	61.0	19
23312	Long grasses and forbs on upland soils	10.1	7
23322	Long grasses and forbs on hydric soils	55.2	4
24110	Upland soils – cropland	163.4	25
24112	Corn	56.4	5
24120	Hydric soils - row cropland	32.6	13
24122	Corn on hydric soils	4.8	2
24210	Upland soils - close grown cropland	61.9	5
24216	Fallow	1.7	1
24217	Hayfield	122.9	19
24220	Hydric soils - close grown cropland	13.9	4
24227	Fallow hydric soils	1.9	1
24228	Hayfield on hydric soils	9.5	7
32112	Oak forest mesic subtype	328.3	45
32150	Maple-basswood forest	422.3	55
32170	Altered/non-native deciduous forest	980.5	280
32220	Lowland hardwood forest	94.7	18
32240	Altered/non-native temporarily flooded deciduous forest	428.8	137
32320	Mixed hardwood swamp	0.2	1
32340	Altered/non-native saturated soils deciduous forest	128.3	35
32430	Altered/non-native seasonally flooded deciduous forest	5.8	5

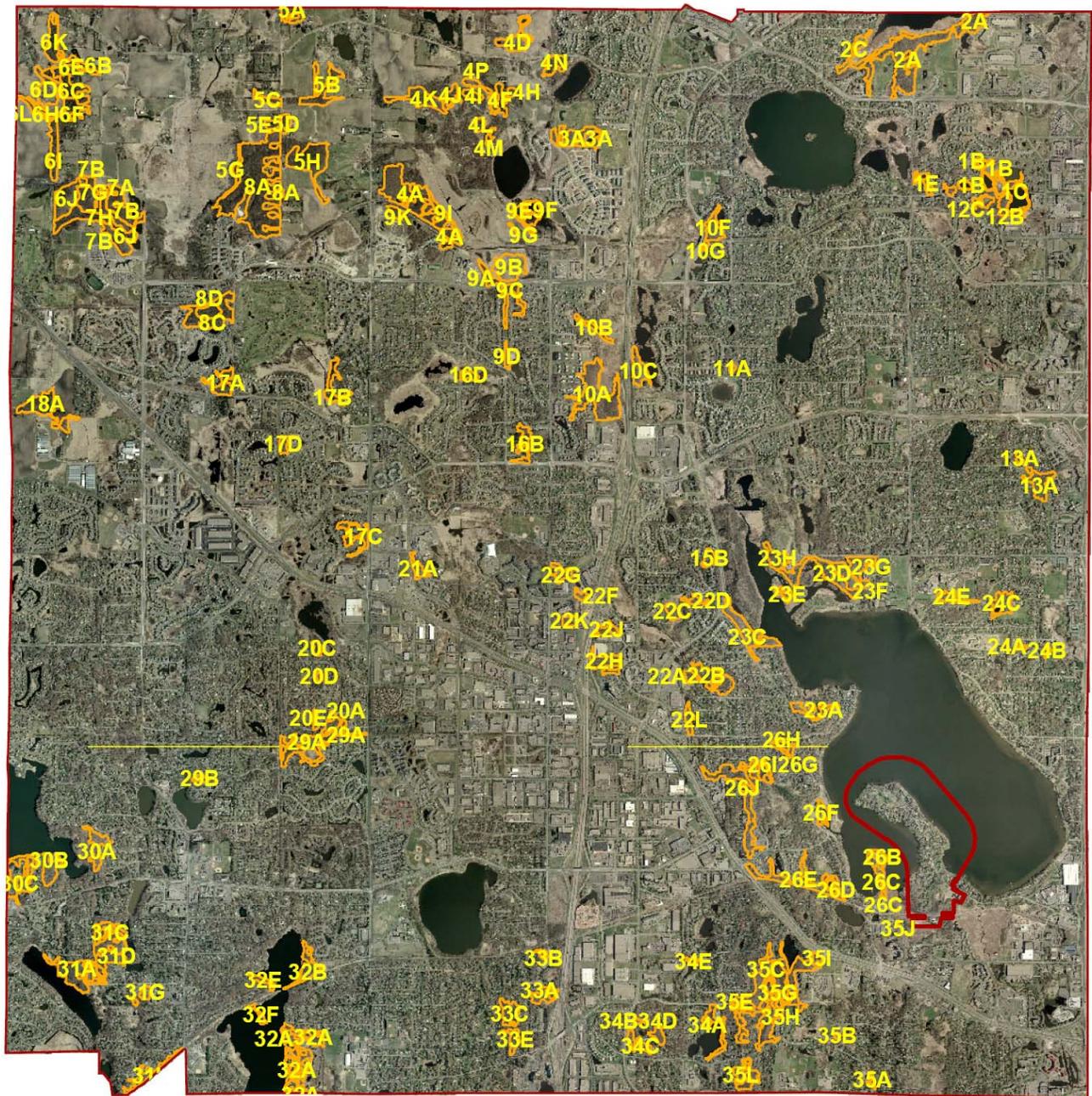
Level 5 Land Cover Summary			
MLCCS Code	Description	Total Acres	# of Polygons
42130	Altered/non-native deciduous woodland	29.9	11
42210	Altered/non-native deciduous woodland - temporarily flooded	13.2	4
42310	Altered/non-native deciduous woodland – saturated	16.4	6
42410	Altered/non-native deciduous woodland - seasonally flooded	3.8	2
43110	Altered/non-native mixed woodland	3.8	1
52130	Altered/non-native dominated upland shrubland	5.2	4
52220	Altered/non-native dominated temporarily flooded shrubland	7.4	3
52330	Altered/non-native dominated saturated shrubland	48.7	16
52360	Willow swamp - saturated soils	1.5	1
52420	Wet meadow shrub subtype	11.5	6
52430	Willow swamp	35.2	7
52440	Altered/non-native dominated seasonally flooded shrubland	3.1	2
52520	Willow swamp - semipermanently flooded	13.8	2
52530	Birch bog, spiraea shrubland - semipermanently flooded	10.5	1

Level 5 Land Cover Summary			
MLCCS Code	Description	Total Acres	# of Polygons
61120	Tall grass altered/non-native dominated grassland	3.2	3
61220	Medium-tall grass altered/non-native dominated grassland	2.8	2
61320	Wet meadow - temporarily flooded soils	0.5	1
61330	Temporarily flooded altered/non-native dominated grassland	116.1	48
61420	Wet meadow	13.9	9
61480	Saturated altered/non-native dominated graminoid vegetation	521.5	179
61520	Mixed emergent marsh - seasonally flooded	2.9	2
61530	Seasonally flooded altered/non-native dominated emergent vegetation	634.3	222
61540	Wet meadow - seasonally flooded	10.1	6
61610	Cattail marsh - semipermanently flooded	2.2	1
61620	Mixed emergent marsh	7.1	7
61630	Semipermanently flooded altered/non-native dominated vegetation	445.2	177
61640	Wet meadow - semipermanently flooded	13.7	2
61641	Wet meadow floating mat subtype	10.8	8
61720	Mixed emergent marsh - intermittently exposed	0.3	1
61730	Intermittently exposed altered/non-native dominated vegetation	78.1	58
61820	Mixed emergent marsh - permanently flooded	3.0	4
61830	Permanently flooded altered/non-native dominated vegetation	83.0	45
62140	Grassland with sparse deciduous trees - altered/non-native do	17.8	6
62310	Altered/non-native grassland with sparse deciduous trees - temporarily flooded	25.3	8
62410	Altered/non-native grassland with sparse deciduous trees - saturated soils	31.7	10
64111	Water lily open marsh	14.7	2
91100	Slow moving linear open water habitat	6.5	4
92100	Limnetic open water	1211.7	8
92220	Floating vascular vegetation - semipermanently flooded littoral aquatic bed	0.1	1
92500	Littoral open water	36.6	3
93220	Floating vascular vegetation	28.8	4
93300	Palustrine open water	655.5	331
Totals:		22,579.5	3,555

APPENDIX B
Natural Areas Species Lists

Species List Identification Numbers

City of Plymouth Land Cover Classification and Natural Resources Inventory



Legend

-  City Boundary
-  Species List - Community ID

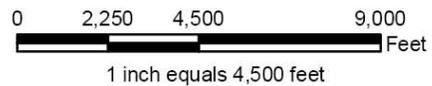


Figure 11

Natural Polygon ID	1A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-3
Surveyor	AJR	Date	9/1/2006

Location	Scientific Name	Common Name
Canopy	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Quercus macrocarpa</i>	Bur Oak
Subcanopy	<i>Amelanchier laevis</i>	Serviceberry
	<i>Populus tremuloides</i>	Quaking Aspen
Shrub	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Cornus serotina</i>	Red Osier Dogwood
Ground	<i>Solidago canadensis</i>	Canada Goldenrod
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Carex rosea</i>	Rosey Sedge
	<i>Artemisia minor</i>	Common Burdock
	<i>Eupatorium rugosum</i>	Cowbane
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge

Notes: Open grown oak forest on island. Wide canopies provide well lit understory. Understory dominated by *Amelanchier laevis* and *Fraxinus pennsylvanica*.

Natural Polygon ID	1B	MLCCS Code	61820
Community Description	Mixed Emergent Marsh - permanently flooded	Quality Ranking	C
Field Check Level	3	Invasives	412-2, 406-2
Surveyor	AJR	Date	9/4/2006

Location	Scientific Name	Common Name
Ground	<i>Sagittaria latifolia</i>	Arrowhead
	<i>Carex utriculata</i>	Common Yellow Lake Sedge
	<i>Calamagrostis canadensis</i>	Canada Blue-joint
	<i>Typha x glauca</i>	Hybrid Cattail
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Alisma subcortatum</i>	Water Plantain
	<i>Leersia oryzoides</i>	Rice Cut Grass
	<i>Glyceria grandis</i>	Tall Manna Grass
	<i>Scirpus cyperinus</i>	Woolgrass
	<i>Scirpus validus</i>	Soft Stem Bulrush
	<i>Sparganium eurycarpum</i>	Common Bur-reed
	<i>Alisma gramineum</i>	Grass-leaved Water Plantain

Notes: Shallow pond shoreline with continuous vegetation. Reed canary grass is limited due to permanent open water. Reed Canary dominates shoreline. Shallow pond dominated by floating, rooted vegetation.

Natural Polygon ID	1C	MLCCS Code	64111
Community Description	Water Lily Open Marsh	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	AJR	Date	

Location	Scientific Name	Common Name
Ground	<i>Sagittaria latifolia</i>	Arrowhead
	<i>Nymphaea odorata</i>	White Water Lily
	<i>Potamogeton nodosus</i>	Long Leaved Pondweed
	<i>Alisma gramineum</i>	Grass-leaved Water Plantain

Notes: Open water ponds and shallow lakes with rooted vegetation. Areas of rooted floating vegetation have emergent fringe present nearer to shore in all cases.

Natural Polygon ID	1D	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	B/C
Field Check Level	3	Invasives	408-2
Surveyor	AJR	Date	9/4/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Prunus serotina</i>	Black Cherry
Subcanopy	<i>Betula papyrifera</i>	Paper Birch
	<i>Ostrya virginiana</i>	Ironwood
	<i>Acer saccharum</i>	Sugar Maple
Shrub	<i>Prunus virginiana</i>	Chokecherry
	<i>Prunus serotina</i>	Black Cherry
	<i>Ribes cynosbati</i>	Prickley Gooseberry
Ground	<i>Actea rubra</i>	Red Baneberry
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arctium minor</i>	Common Burdock
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Fraxinus pennsylvancia</i>	Green Ash
	<i>Hackelia deflexa</i>	Stickseed
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Maianthemum canadense</i>	Canada Mayflower
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Prunus virginiana</i>	Chokecherry

Notes: Oak Forest with mature mixed overstory dominated by White and Bur Oak and Ironwood dominated understory. Neighborhood removed heavy buckthorn shrub layer in Fall 2005. Ground layer somewhat sparse, dominated by *Prunus* resprouts. 30"+ oaks common.

Natural Polygon ID	1E	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-4
Surveyor	AJR	Date	9/4/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Prunus serotina</i>	Black Cherry
Subcanopy	<i>Betula papyrifera</i>	Paper Birch
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ostrya virginiana</i>	Ironwood
	<i>Acer saccharum</i>	Sugar Maple
Shrub	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Prunus serotina</i>	Black Cherry
	<i>Ribes cynosbati</i>	Prickley Gooseberry
Ground	<i>Actea rubra</i>	Red Baneberry
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arctium minor</i>	Common Burdock
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Fraxinus pennsylvancia</i>	Green Ash
	<i>Hackelia deflexa</i>	Stickseed
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Maianthemum canadense</i>	Canada Mayflower
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Prunus virginiana</i>	Chokecherry
<i>Rhamnus cathartica</i>	Common Buckthorn	

Notes: Oak Forest with mature mixed overstory dominated by White and Bur Oak and Ironwood dominated understory. Neighborhood removed heavy buckthorn shrub layer in Fall 2005. Ground layer somewhat sparse, dominated by Prunus resprouts. 30"+ oaks commo

Natural Polygon ID	2A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-6, 411-3
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Quercus alba</i>	White Oak
	<i>Prunus serotina</i>	Black Cherry
	<i>Celtis occidentalis</i>	Hackberry
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus rubra</i>	Red Oak
Subcanopy/Shrub	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Acer negundo</i>	Boxelder
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Prunus virginiana</i>	Chokecherry
	<i>Ulmus americana</i>	American Elm
	<i>Betula papyrifera</i>	Paper Birch
	<i>Viburnum lentago</i>	Nannyberry
	<i>Carya cordiformis</i>	Bitternut Hickory
	Ground	<i>Athyrium filix-femina</i>
<i>Arisaema triphyllum</i>		Jack in the Pulpit
<i>Galium aparine</i>		Cleavers
<i>Carex rosea</i>		Rosey Sedge
		Three lobed
<i>Galium trifidum</i>		bedstraw
<i>Artemisia minor</i>		Common Burdock
<i>Amphicarpaea bracteata</i>		Hog-peanut
<i>Plantago Major</i>		Common Plantain
<i>Ranunculus abortivus</i>		Small Flowered Buttercup
<i>Circaea luteana</i>		Enchanter's Nightshade
<i>Carex blanda</i>		Common Woodland Sedge

Notes: Stand dominated by large, well-spaced open-grown oaks - mostly *Quercus alba*. Gaps filling in with green ash, Boxelder and Hackberry. Dense, heavy infestation of *Rhamnus cathartica*. Large trees and continuous carpet of Buckthorn Seedlings. Sugar Maple not seen. Site includes a small Black Ash swamp in wet depression. Heavy Phalaris cover throughout.

Natural Polygon ID	2C	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 410-3, 412-3
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash

Notes: Lowland Hardwood Forest in small slough parallel to Lake dominate by *Fraxinus pennsylvanica*. Very disturbed with much *Rhamnus cathartica*. Low diversity. Wood duck box present.

Natural Polygon ID	3A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Prunus serotina</i>	Black Cherry
Subcanopy	<i>Ostrya virginiana</i>	Ironwood

Notes: Oak forest surrounded by 6' tall chainlink fence. Of private golf course. South end is dominated by large, open grown white oaks. Heavy subcanopy of *Ostrya*. Much *Zanthoxylum* present. Only way to access is through golf course. Very large, open grown trees well spaced apart. Gaps between large trees are filled with *Ostrya*.

Natural Polygon ID	4A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-2, 410-2
Surveyor	FH	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Celtis occidentalis</i>	Hackberry
	<i>Prunus serotina</i>	Black Cherry
	<i>Acer rubrum</i>	Red Maple
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Ulmus americana</i>	American Elm
	<i>Acer rubrum</i>	Red Maple
	<i>Tilia americana</i>	Basswood
Shrub	<i>Corylus americana</i>	Hazelnut
	<i>Viburnum lentago</i>	Nannyberry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes americana</i>	Prickley Gooseberry
Ground	<i>Circaea luteana</i>	Enchanter's Nightshad
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Parthenocissus inserta</i>	Woodbine
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Prunus serotina</i>	Black Cherry
<i>Anemonella thalictroides</i>	Rue-anemone	

Notes: Mesic Oak Forest dominated by White Oak. Occasional Red Oak, Green Ash in canopy. Well-spaced, large trees. Scattered old, well rotted cut stumps. Dense matrix subcanopy-sized trees mostly *Ostrya* and *Acer sacharum*. Virtually no shrubs present. Ground layer very sparse and depauperate. Low diversity. Buckthorn more or less absent. Basswood very rare.

Natural Polygon ID	4B	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	C
Field Check Level	3	Invasives	412-4
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrubs	<i>Cornus stolonifera</i>	Red Osier Dogwood
	<i>Acer rubra</i>	Red Maple
Ground	<i>Carex lacustris</i>	Lake Sedge
		Narrow Leaved
	<i>Typha angustifolia</i>	Cattail
	<i>Impatiens</i> sp.	Jewellweed
	<i>Thelypodium palustre</i>	Marsh Fern

Notes: Sedge Meadow in small basin surrounded by forest. Dominated throughout by *Carex lacustris*. Very low diversity. Reed canary grass occupies broad zone on Eastern edge of wetland. Wet with standing water. Few *Typha*. Wetland delineation flags present. Disturbed land East of wetland is dense buckthorn thicket with few trees - very nasty.

Natural Polygon ID	4D	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	C/D
Field Check Level	3	Invasives	402-2, 406-5, 412-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrubs	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Calamagrostis canadensis</i>	Canada bluejoint
	<i>Lythrum salicaria</i>	Purple Loosestrife
		Narrow Leaved
	<i>Typha angustifolia</i>	Cattail
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Cicuta bulbosa</i>	Water Hemlock

Notes: Wet Meadow dominated by *Salix petiolaris* and Cattails. *Carex lacustris* present throughout but not as dense as *Typha*. Reed Canary Grass confined to edges. Water table 1 foot above ground during mid June survey. Low diversity. Heavy construction/development just North of wetland.

Natural Polygon ID	4E	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	D
Field Check Level	3	Invasives	412-4
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrubs	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Salix petiolaris</i>	Meadow Willow
	<i>Salix discolor</i>	Pussy Willow
	<i>Cornus stolonifera</i>	Red Osier Dogwood
Ground	<i>Phalaris arundinacea</i>	Reed Canary Grass

Notes: Low diversity, heavy Reed Canary Grass invasion with much Green Ash invasion.

Natural Polygon ID	4F	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-2
Surveyor	FH	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Quercus rubra</i>	Red Oak
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Acer negundo</i>	Boxelder
	<i>Quercus alba</i>	White Oak
	<i>Tilia americana</i>	Basswood
	<i>Prunus serotina</i>	Black Cherry
Subcanopy	<i>Tilia americana</i>	Basswood
	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
Shrub	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Prunus virginiana</i>	Chokecherry
	<i>Zanthoxylum americana</i>	Prickley Ash
Ground	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Allium tricoccum</i>	Wild Leek
	<i>Aquilegia canadensis</i>	Wild columbine
	<i>Ulmus rubra</i>	Red Elm
	<i>Desmodium glutinosum</i>	Pointed Tick-trefoil
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
<i>Phryma leptostachya</i>	Lopseed	
	<i>Arisaema triphyllum</i>	Jack in the Pulpit

Natural Polygon ID	4F	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Artem minor</i>	Common Burdock
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Carex blanda</i>	Common Woodland Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Cryptotaenia canadensis</i>	Canada honewort
	<i>Solidago flexicalis</i>	Zig-zag Goldenrod
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Galium aparine</i>	Cleavers
		Three lobed
	<i>Galium trifidum</i>	bedstraw
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Plantago Major</i>	Common Plantain
<i>Ranunuculus arbortivus</i>	Small Flowered Buttercup	

Notes: Narrow strip of Oak-Basswood Forest dominated by Red Oak and American Basswood on west facing slopes. Level ground toe slopes dominated by Boxelder. Small Buckthorn abundant. Scattered large trees and mostly smaller trees in canopy. Sugar Mapl

Natural Polygon ID	4H	MLCCS Code	32112
Community Description	Mesic Forest, Oak Subtype	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Red Elm
Subcanopy	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
Shrub Ground	<i>Zanthoxylum americana</i>	Prickley Ash
	<i>Actea rubra</i>	Red Baneberry
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Brachyelytrum erectum</i>	Bearded Shorthusk
	<i>Carex blanda</i>	Common Woodland Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Galium aparine</i>	Cleavers
	<i>Osmunda claytoniana</i>	Interrupted Fern
	<i>Phryma leptostachya</i>	Lopseed
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Sanicula mariliandica</i>	Black Snakeroot
<i>Thalictrum dioicum</i>	Meadow Rue	

Notes: Knob is mesic oak Forest dominated by *Quercus alba*, *Q. rubra* and *Fraxinus pennsylvanica*. These are all mid-aged, young and multi-stemmed. Scattered old stumps present. Good diversity and abundance of herbs. No Sugar Maple.

Natural Polygon ID	4I	MLCCS Code	32112
Community Description	Mesic Forest, Oak Subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name	
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash	
	<i>Populus grandidentata</i>	Big Toothed Aspen	
	<i>Quercus alba</i>	White Oak	
	<i>Quercus rubra</i>	Red Oak	
Subcanopy	<i>Acer saccharum</i>	Sugar Maple	
	<i>Carya cordiformis</i>	Bitternut Hickory	
	<i>Ostrya virginiana</i>	Ironwood	
	<i>Prunus serotina</i>	Black Cherry	
	<i>Ulmus rubra</i>	Red Elm	
Shrub	<i>Acer negundo</i>	Boxelder	
	<i>Carya cordiformis</i>	Bitternut Hickory	
	<i>Cornus racemosa</i>	Gray Dogwood	
	<i>Populus grandidentata</i>	Big Toothed Aspen	
	<i>Prunus serotina</i>	Black Cherry	
	<i>Prunus virginiana</i>	Chokecherry	
	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Zanthoxylum americana</i>	Prickley Ash	
	Ground	<i>Actea rubra</i>	Red Baneberry
		<i>Amphicarpaea bracteata</i>	Hog-peanut
<i>Athyrium angustifolium</i>		Glade Fern	
<i>Carex blanda</i>		Common Woodland Sedge	
		Pennsylvania	
<i>Carex pennsylvanica</i>		Sedge	
<i>Galium aparine</i>		Cleavers	
<i>Galium boreale</i>		Northern Bedstraw	
<i>Galium trifidum</i>		Northern Three Lobed Bedstraw	
<i>Hydrophyllum virginianum</i>		Virginia Waterleaf	
<i>Osmunda claytoniana</i>		Interrupted Fern	
<i>Phryma leptostachya</i>		Lopseed	
<i>Sanguinaria canadensis</i>		Bloodroot	
<i>Sanicula marilandica</i>		Black Snakeroot	
		False Solomon's	
<i>Smilacina racemosa</i>		Seal	
<i>Thalictrum dioicum</i>		Meadow Rue	

Notes: Small nature second growth stand was cut 80-100 years ago. Dominated by *Quercus rubra*, many of which are multi-stemmed. Fairly gappy canopy. Sugar Maple present but sparse. Big Toothed Aspen clones present. Moderate to Good herbaceous diversity. Low Buckthorn infestation.

Natural Polygon ID	4J	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	B
Field Check Level	4	Invasives	412-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrub	<i>Acer rubrum</i>	Red Maple
	<i>Betula pumila</i>	Bog Birch
	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Ribes americanum</i>	American Black Currant
	<i>Salix discolor</i>	Pussy Willow
	<i>Salix petiolaris</i>	Meadow Willow White
	<i>Spiraea alba</i>	Meadowsweet
	<i>Ulmus americana</i>	American Elm
Ground	<i>Aster puniceus</i>	Swamp Aster
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Campanula aparinoides</i>	Marsh Bellflower
	<i>Carex comosa</i>	Bottlebrush Sedge Greater Bladder Sedge
	<i>Carex intumescens</i>	Sedge
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex Ovales</i> Type	A species of Sedge Common Fox Sedge
	<i>Carex stipata</i>	Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Cicuta bulbosa</i>	Water Hemlock
	<i>Equisetum palustre</i>	Marsh Horsetail
	<i>Eupatorium maculatum</i>	Joe-Pye-Weed
	<i>Galium</i> sp.	Bedstraw
	<i>Glyceria striata</i>	Fowl Manna Grass
	<i>Impatiens capensis</i>	Jewellweed

Natural Polygon ID	4J	MLCCS Code	52430
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Location	Scientific Name	Common Name
Ground cont.	<i>Lycopus americanus</i>	American Water-horehoud
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Poa palustris</i>	Fowl Meadow Grass
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Typha sp.</i>	Cattail

Notes: Swamp dominated by 50% tall Salix and 50% by Calamagrostis canadensis and Carex lacustris. Inner portion is in good condition with very good diversity. Surrounded by Phalaris and some Phalaris patches inside. Southwest 1/4 portion is forested swamp dominated by Black Ash and contains one large Tamarack. Intack understory of some herbs with scattered small patches of Phalaris. Phalaris seems to be increasing in the wetland.

Natural Polygon ID	4K	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple

Notes: Tall, even aged stand dominated by Acer saccharum - all approximately 40 cm dbh. Very, very few trees of other species present. I saw one Tilia and 4-5 Red Oak. Heavy subcanopy of amd small sapling layers comprised entirely of Sugar Maple. Heavy shade virtually with virtually no herbs present due to heavy maple shade.

Natural Polygon ID	4L	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	A/B
Field Check Level	4	Invasives	
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrub	<i>Betula pumila</i>	Bog Birch
	<i>Cornus stolonifera</i>	Red Osier Dogwood
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Salix discolor</i>	Pussy Willow
	<i>Salix pedicularis</i>	Bog Willow
Ground	<i>Aster borealis</i>	Northern Bog Aster
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lacustris</i>	Lake Sedge Common Fox
	<i>Carex stipata</i>	Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Eleocharis sp.</i>	A species of Spikerush
	<i>Epilobium leptophyllum</i>	American Marsh Willow Herb
	<i>Eupatorium maculatum</i>	Joe-Pye-Weed
	<i>Iris versicolor</i>	Blueflag Iris
	<i>Juncus brevicaudatus</i>	Narrow Panicle Rush
	<i>Lycopus americanus</i>	American Water- horehound
	<i>Lycopus uniflorus</i>	Northern Bugleweed
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Mentha arvensis</i>	Wild Mint
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Polygonum amphibium</i>	Water Smartweed Arrow leaved
	<i>Polygonum saggitatum</i>	Tearthumb
	<i>Potentilla palustre</i>	Marsh Cinquefoil Red Dwarf
	<i>Rubus pubescens</i>	Raspberry
	<i>Rumex crispus</i>	Curly Dock
<i>Rumex orbiculatus</i>	Greater Water Dock	
<i>Sagittaria grandifolia</i>	Arrowhead	
<i>Scirpus cyperinus</i>	Woolgrass	
<i>Sphagnum sp.</i>	Sphagnum Moss	
<i>Thelypteris palustris</i>	Marsh Fern	

Natural Polygon ID	4L	MLCCS Code	52430
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Location	Scientific Name	Common Name
Ground cont.	<i>Triadenum fraseri</i>	Bog St. John's Wort
	<i>Typhya latifolia</i>	Broad Leaved Cattail
	<i>Viola cf. Cucullata</i>	Blue Marsh Violet

Notes: High quality shrub swamp dominated by *Betula pumila* and *Salix petiolaris*. Shrubs cover 50%-75%, Graminoids 25%-50%. Innermost zone has carpet of Sphagnum. Outermost 1/2 is dominated by *Calamagrostis canadensis*, *Carex lacustris* and *C. utriculata*. Rich diversity of native wetland species present. No *Phalaris* present except a outermost edges. Surrounded by a belt of *Phalaris*. *Fraxinus pennsylvanica* is present.

Natural Polygon ID	4M	MLCCS Code	32112
Community Description	Mesic Forest, Oak Subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-3, 411-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Red Elm
Subcanopy/Shrub		Tatarian
	<i>Lonicera tatarica</i>	Honeysuckle
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm

Notes: Narrow strip of Oak Forest on slopes. Fair to low herbaceous diversity with homes on edge.

Natural Polygon ID	4N	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	C
Field Check Level	3	Invasives	412-2, 402-3
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrub	<i>Betula pumila</i>	Bog Birch
	<i>Cornus stolonifera</i>	Red Osier Dogwood
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Salix discolor</i>	Pussy Willow
	<i>Salix petiolaris</i>	Meadow Willow White
	<i>Spiraea alba</i>	Meadowsweet
	<i>Ulmus americana</i>	American Elm
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Aster punecius</i>	Swamp Aster
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex Ovales Type</i>	Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Eleocharis palustris</i>	Marsh Spikerush
	<i>Epilobium leptophyllum</i>	American Marsh Willow Herb
	<i>Equisetum palustre</i>	Marsh Horsetail
	<i>Iris virginica</i>	Southern Blue Flag Iris Northern
	<i>Lycopus uniflorus</i>	Bugleweed
	<i>Lysimachia thyriflora</i>	Swamp Loosestrife
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Rumex orbiculatus</i>	Greater Water Dock
	<i>Scirpus atrovirens</i>	Dark Green Bulrush
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Triadenum fraseri</i>	Bog St. John's Wort Broad Leaved
	<i>Typhya latifolia</i>	Cattail
	<i>Viola cf. Cucullata</i>	Blue Marsh Violet

Notes: Swamp dominated by dense, tall thicket of *Salix petiolaris*, *Salix discolor* and *Betula pumila*. Shrubs reach 15-20' tall, probably due to decreased water table. Dense zone of Tussock Sedge on outside. Good native species diversity. Purple Loosestrife more or less scattered throughout. Surrounded by moat and *Phalaris arundinacea*. Wetland is bisected by powerline and is sprayed under powerline on section line.

Natural Polygon ID	40	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	B
Field Check Level	4	Invasives	412-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus nigra</i>	Black Ash
	<i>Larix laricina</i>	Tamarack
Shrub	<i>Acer rubrum</i>	Red Maple
	<i>Betula pumila</i>	Bog Birch
	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Ribes americanum</i>	American Black Currant
	<i>Salix discolor</i>	Pussy Willow
	<i>Salix petiolaris</i>	Meadow Willow
		White
		Meadowsweet
Ground	<i>Ulmus americana</i>	American Elm
	<i>Aster puniceus</i>	Swamp Aster
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Campanula aparinoides</i>	Marsh Bellflower
	<i>Carex comosa</i>	Bottlebrush Sedge
		Greater Bladder
	<i>Carex intumescens</i>	Sedge
	<i>Carex lacustris</i>	Lake Sedge
		Bristle Stalked
	<i>Carex leptalea</i>	Sedge
	<i>Carex Ovales</i> Type	A species of Sedge
		Common Fox
	<i>Carex stipata</i>	Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Cicuta bulbosa</i>	Water Hemlock
	<i>Equisetum palustre</i>	Marsh Horsetail
	<i>Eupatorium maculatum</i>	Joe-Pye-Weed
	<i>Galium sp.</i>	Bedstraw
<i>Glyceria striata</i>	Fowl Manna Grass	
<i>Impatiens capensis</i>	Jewellweed	
<i>Lycopus americanus</i>	American Water-horehound	
<i>Onoclea sensibilis</i>	Sensitive Fern	
<i>Phalaris arundinacea</i>	Reed Canary Grass	

Natural Polygon ID	4O	MLCCS Code	52430
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Location	Scientific Name	Common Name
Ground cont.	<i>Poa palustris</i>	Fowl Meadow Grass
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Typha sp.</i>	Cattail

Notes: Forested swamp dominated by Black Ash and contains one large Tamarack. Intact understory of some herbs with scattered small patches of Phalaris. Phalaris seems to be increasing in the wetland. Surrounded by Phalaris and some Phalaris patches inside.

Natural Polygon ID	4P	MLCCS Code	52360
Community Description	Willow Swamp - Saturated Soils	Quality Ranking	C
Field Check Level	3	Invasives	406-3, 412-3
Surveyor	AJR	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Saturated Willow Swamp with scattered Green Ash. Ground layer dominated by sedges. Reed Canary limited by Shade

Natural Polygon ID	5A	MLCCS Code	32150
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Acer negundo</i>	Boxelder
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
	<i>Ulmus rubra</i>	Red Elm
	Ground	<i>Arisaema tryphyllum</i>
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosy Sedge
		Broad Leaved Enchanters
	<i>Circaea luteana</i>	Nightshade
	<i>Galium aparine</i>	Cleavers
	<i>Galium triflorum</i>	Fragrant Bedstraw
	<i>Hydrophyllum virginiana</i>	Virginia waterleaf
	<i>Osmunda claytoniana</i>	Interrupted Fern
	<i>Poa pratensis</i>	Kentucky Bluegrass
	<i>Ranunculus arbotivus</i>	Small Flowered Buttercup
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
		Downy Yellow
	<i>Viola pubescens</i>	Violet

Notes:

Highly disturbed Maple Basswood forest grazed by horses. Scattered, large open grown *Acer saccharum* within a matrix of subcanopy sized trees (3"-5" dbh). Dense cover of small *Acer* present. Gaps have mesic Maple Basswood Forest herbaceous cover. Numerous trails. Site is heavily Maple dominated. Oaks are absent. Buckthorn present but not abundant. Moderate herbaceous diversity. Dead Butternut present.

Natural Polygon ID	5B	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	3	Invasives	408-2, 411-2
Surveyor	FH	Date	5/17/2006

Location	Scientific Name	Common Name	
Canopy	<i>Acer saccharum</i>	Sugar Maple	
	<i>Prunus serotina</i>	Black Cherry	
	<i>Quercus alba</i>	White Oak	
	<i>Quercus rubra</i>	Red Oak	
	<i>Tilia americana</i>	Basswood	
Subcanopy	<i>Acer negundo</i>	Boxelder	
	<i>Acer saccharum</i>	Sugar Maple	
	<i>Carya cordiformis</i>	Bitternut Hickory	
	<i>Fraxinus pennsylvanica</i>	Green Ash	
	<i>Ostrya virginiana</i>	Ironwood	
	<i>Prunus serotina</i>	Black Cherry	
	<i>Tilia americana</i>	Basswood	
	<i>Ulmus americana</i>	American Elm	
	Ground	<i>Anemone quinquefolia</i>	Wood Anemone
		<i>Arisaema triphyllum</i>	Jack in the Pulpit
<i>Asarum canadense</i>		Wild Ginger	
<i>Athyrium filix femina</i>		Lady Fern	
		Pennsylvania	
<i>Carex pennsylvanica</i>		Sedge	
<i>Carex rosea</i>		Rosey Sedge	
<i>Carex sprengei</i>		Sprengel's Sedge	
<i>Galium aparine</i>		Cleavers	
<i>Hydrophyllum virginianum</i>		Virginia Waterleaf	
<i>Thalictrum dioicum</i>		Early Meadow Rue	
		Common Blue	
<i>Viola sororia</i>		Violet	

Notes: Widely spaced large trees-open grown and wolfy. Abundant red and white oaks and basswood. Large Maples uncommon. Basswood are all multi-stemmed. Dense matrix of small saplings 3"-4" dbh. Many recent cut stumps present. Herbaceous layer very sparse under heavy tree sapling cover (60% of site). Other more open parts of stand have low herbaceous diversity. Buckthorn rare. 1 large patch of Garlic Mustard at Eastern Edge. No large buckthorn.

Natural Polygon ID	5C	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C/D
Field Check Level	4	Invasives	408-2
Surveyor	FH	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Ground	<i>Actaea rubra</i>	Red Baneberry
	<i>Anemone quinquefolia</i>	Wood Anemone
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Asarum canadense</i>	Wild Ginger
	<i>Athyrium filix femina</i>	Lady Fern
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Carex sprengelii</i>	Sprengel's Sedge
	<i>Galium aparine</i>	Cleavers
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Matteuchia struthiopteris</i>	Ostrich Fern
	<i>Oryzopsis racemosa</i>	Black-seeded Ricegrass
	<i>Solidago flexicaulis</i>	Zig Zag Goldenrod
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort
		Common Blue
	<i>Viola sororia</i>	Violet

Notes: Very narrow strip - all edge. Disturbed by selective logging. Dominated by *Tilia*, *Acer saccharum* and *Quercus rubra*, all large, open grown trees. Dense cover small saplings. Good herbaceous cover diversity. Buckthorn present but uncommon. Located along drainageway that is deeply incised and has some bank erosion. Lots of discarded junk.

Natural Polygon ID	5D	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	
Surveyor	FH	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
Ground	<i>Anemone quinquefolia</i>	Wood Anemone
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Asarum canadense</i>	Wild Ginger
	<i>Athyrium filix femina</i>	Lady Fern
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Carex sprengei</i>	Sprengel's Sedge
	<i>Galium aparine</i>	Cleavers
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Thalictrum dioicum</i>	Early Meadow Rue
		Common Blue
	<i>Viola sororia</i>	Violet

Notes: Small lot. Dominated by Red Oak, Basswood, Green Ash and White Oak. Lots of young maples. Sparse depauperate ground layer trees with more or less open grown trees due to past selective logging.

Natural Polygon ID	5E	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	
Surveyor	FH	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
Shrub	<i>Prunus virginiana</i>	Chokecherry

Notes: Scattered multi-stemmed oaks within dense matrix of *Acer saccharum* saplings. Very depauperate herbaceous layer. Heavy shade by maples. Basswood appears to be absent.

Natural Polygon ID	5F	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-3
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Salix x rubra</i>	Red Willow
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
	Subcanopy	<i>Carya cordiformis</i>
<i>Fraxinus nigra</i>		Black Ash
<i>Ostrya virginiana</i>		Ironwood
<i>Prunus serotina</i>		Black Cherry
<i>Tilia americana</i>		Basswood
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickley Gooseberry
	<i>Zanthoxylum americana</i>	Prickley Ash
Ground	<i>Adiantum petadum</i>	Maidenhair Fern
	<i>Allium tricoccum</i>	Wild Leek
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Aquilegia canadensis</i>	Wild columbine
	<i>Arisaema triphyllum</i>	Jack in the Pulpet
	<i>Artemisia minor</i>	Common Burdock
	<i>Asarum canadense</i>	Wild Ginger
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Botrychium virginianum</i>	Rattlesnake Fern
	<i>Carex blanda</i>	Common Woodland Sedge
	<i>Carex deweyana</i>	Dewey's Sedge
	<i>Carex gracillima</i>	Graceful Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
<i>Carex rosea</i>	Rosey Sedge	

Natural Polygon ID	5F	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Cryptotaenia canadensis</i>	Canada honewort
	<i>Desmodium glutinosum</i>	Pointed Tick-trefoil
	<i>Galium aparine</i>	Cleavers
	<i>Galium trifidum</i>	Three lobed bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hackelia virginiana</i>	Stickseed
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Laportea canadensis</i>	Wood Nettle
	<i>Matteuchia struthiopteris</i>	Ostrich Fern
	<i>Oryzopsis racemosa</i>	Black Seeded Rice Grass
	<i>Osmorhiza Claytonii</i>	Bland Sweet Cicily
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Phryma leptostachya</i>	Lopseed
	<i>Plantago Major</i>	Common Plantain
	<i>Polygonatum commutatum</i>	Giant Solomon's Seal
	<i>Ranunculus arbortivus</i>	Small Flowered Buttercup
	<i>Sanicula marilandica</i>	Black Snakeroot
	<i>Smilacina racemosa</i>	False Solomon's Seal
	<i>Smilax cf ecirrhata</i>	Upright Carrion Flower
<i>Solidago flexicalis</i>	Zig-zag Goldenrod	
<i>Ulmus rubra</i>	Red Elm	
<i>Urtica dioica</i>	Stinging Nettle	
<i>Uvularia grandiflora</i>	Large Flowered Bellwort	
<i>Viola pubescens</i>	Downy Yellow Violet	
<i>Viola sororia</i>	common Blue Violet	

Notes: Mesic Oak Forest dominated by *Quercus rubra* (or *Q. ellipsoidalis/rubra* hybrid) and *Carya cordiformis*. *Acer saccharum*, *Quercus alba*, *Fraxinus pennsylvanica*, *Populus grandidentata* are also frequent. Trees are semi-overgrown and most are multi-stemmed. Past heavy logging many years ago. *Tilia* is mostly absent as a canopy tree in most of these wood due to selective logging. High abundance of *Carya* due to logging. Dense subcanopy of *Acer saccharum* and *Ostrya*. Some areas have continuous large *Ostrya*. Herbaceous layer is excellent: highly diverse and mostly continuous. BUckthorn is present but very sparse. Garlic Mustard not seen. Searched for Ginseng without success. Deer stands in Northeast end has stream that is highly incised with eroded banks. Buckthorn dense in patches at Eastern edge near road.

Natural Polygon ID	5G	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	C
Field Check Level	4	Invasives	412-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
Ground	<i>Galium aparine</i>	Cleavers
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Laportea canadensis</i>	Wood Nettle
	<i>Matteuchia struthiopteris</i>	Ostrich Fern

Notes: Lowland Hardwood Forest in poor condition. Dominated by widely spaced large *Tilia americana*, *Fraxinus pennsylvanica* and *Acer negundo*. Frequent large gaps.

Natural Polygon ID	5H	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Ground	<i>Adiantum petadum</i>	Maidenhair Fern
	<i>Allium tricoccum</i>	Wild Leek
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Aquilegia canadensis</i>	Wild columbine
	<i>Arisaema triphyllum</i>	Jack in the Pulpet
	<i>Artemisia minor</i>	Common Burdock
	<i>Asarum canadense</i>	Wild Ginger
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Botrychium virginianum</i>	Rattlesnake Fern
	<i>Carex blanda</i>	Common Woodland Sedge
	<i>Carex deweyana</i>	Dewey's Sedge

Natural Polygon ID	5H	MLCCS Code	32112
Location	Scientific Name	Common Name	

Ground cont.

<i>Carex rosea</i>	Rosey Sedge
<i>Circaea luteana</i>	Enchanter's Nightshade
<i>Cryptotaenia canadensis</i>	Canada honewort
<i>Desmodium glutinosum</i>	Pointed Tick-trefoil
<i>Galium aparine</i>	Cleavers
<i>Galium trifidum</i>	Three lobed bedstraw
<i>Geranium maculatum</i>	Wild Geranium
<i>Hackelia virginiana</i>	Stickseed
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
<i>Laportea canadensis</i>	Wood Nettle
<i>Matteuchia struthiopteris</i>	Ostrich Fern
<i>Oryzopsis racemosa</i>	Black Seeded Rice Grass
<i>Osmorhiza Claytonii</i>	Bland Sweet Cicily
<i>Parthenocissus inserta</i>	Woodbine
<i>Phryma leptostachya</i>	Lopseed
<i>Plantago Major</i>	Common Plantain
<i>Polygonatum commutatum</i>	Giant Solomon's Seal
<i>Ranunculus abortivus</i>	Small Flowered Buttercup
<i>Sanicula marilandica</i>	Black Snakeroot
<i>Smilacina cf echirrata</i>	Upright Carrion Flower
<i>Smilacina racemosa</i>	False Solomon's Seal
<i>Solidago flexicalis</i>	Zig-zag Goldenrod
<i>Ulmus rubra</i>	Red Elm
<i>Urtica dioica</i>	Stinging Nettle
<i>Uvularia grandiflora</i>	Large Flowered Bellwort
<i>Viola pubescens</i>	Downy Yellow Violet
<i>Viola sororia</i>	common Blue Violet

Notes: Formerly logged Oak stand dominated by multi-stemmed *Quercus rubra/rubra* hybrid with occasional *Quercus alba*, *Carya cordiformis*, *Prunus serotina*, *Populus grandidentata*. Dense subcanopy of *Ostrya* and *Acer saccharum*. Continuous and diverse ground layer

Natural Polygon ID	6A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	3	Invasives	408-5
Surveyor	FH	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubra</i>	Red Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Juniperus virginiana</i>	Eastern Red Cedar
	<i>Ostrya virginiana</i>	Ironwood
Shrub	<i>Acer negundo</i>	Boxelder
	<i>Carya cordiformis</i>	Bitternut hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Actea rubra</i>	Red Baneberry
	<i>Adiantum pedatum</i>	Maidenhair Fern
	<i>Aquilegia canadensis</i>	Wild columbine
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Brachyelytrum erectum</i>	Long-awned woodgrass
	<i>Carex deweyana</i>	Dewey's Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex radiata</i>	Eastern Star Sedge
	<i>Carex sprengelii</i>	Sprengle's Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hackelia virginiana</i>	Stickseed
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf

Natural Polygon ID	6A	MLCCS Code	32150
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Location	Scientific Name	Common Name
Ground cont.	<i>Maianthemum canadensis</i>	Canada Mayflower
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Solidago flexicalis</i>	Zig-zag Goldenrod
	<i>Thalictrum dioicum</i>	Early Meadowrue
	<i>Trillium cernuum</i>	Nodding Trillium
	<i>Viburnum lentago</i>	Nannyberry
		Downy Yellow
	<i>Viola pubescens</i>	Violet
	<i>Viola sororia</i>	common Blue Violet

Notes: Maple Basswood Forest stand dominated by Tilia with Aspen clones. Tall straight trees. Heavy buckthorn infestation. Moderately good species diversity. Few Red Oak and Sugar Maple

Natural Polygon ID	6B	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5
Surveyor	FH	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Carya cordiformis</i>	Bitternut hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus alba</i>	White Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus thomasii</i>	Rock Elm
Subcanopy	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Prunus virginiana</i>	Chokecherry
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Viburnum lentago</i>	Nannyberry
	<i>Viburnum rafinesquianum</i>	Arrowwood
	<i>Actea rubra</i>	Red Baneberry
Ground	<i>Adiantum pedatum</i>	Maidenhair Fern
	<i>Allium tricoccum</i>	Wild Leek
	<i>Anemone quinquefolia</i>	Wood Anemone
	<i>Aquilegia canadensis</i>	Wild columbine
	<i>Arisaema triphyllum</i>	Jack in the Pulpet

Natural Polygon ID	6B	MLCCS Code	32220
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Location	Scientific Name	Common Name
Ground cont.	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Brachyelytrum erectum</i>	Long-awned woodgrass
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex deweyana</i>	Dewey's Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex hirtifolia</i>	Hairy Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex radiata</i>	Eastern Star Sedge
	<i>Carex sprengeii</i>	Sprengle's Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Galium aparine</i>	Cleavers
	<i>Galium trifidum</i>	Three Lobed Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hackelia virginiana</i>	Stickseed
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Maianthemum canadensis</i>	Canada Mayflower
	<i>Matteuchia struthiopteris</i>	Ostrich Fern
	<i>Osmunda claytonii</i>	Interrupted Fern
	<i>Ranunculus abortivus</i>	Small Flowered Buttercup
	<i>Smilacina racemosa</i>	False Solomon's Seal
<i>Solidago flexicalis</i>	Zig-zag Goldenrod	
<i>Trillium cernuum</i>	Nodding Trillium	
<i>Viburnum lentago</i>	Nannyberry	
<i>Zizia aurea</i>	Golden Alexanders	

Notes: Lowland Hardwood Forest dominated by scattered Cottonwood, Basswood and Green Ash - semi-open grown, even aged, young ~40cm dbh in dense matrix of buckthorn. Moderately diverse ground layer with lots of Buckthorn. Scattered old rotted stumps.

Natural Polygon ID	6C	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	3	Invasives	408-5
Surveyor	FH	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubra</i>	Red Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Juniperus virginiana</i>	Eastern Red Cedar
	<i>Ostrya virginiana</i>	Ironwood
Shrub	<i>Acer negundo</i>	Boxelder
	<i>Carya cordiformis</i>	Bitternut hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Actea rubra</i>	Red Baneberry
	<i>Adiantum pedatum</i>	Maidenhair Fern
	<i>Aquilegia canadensis</i>	Wild columbine
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Brachyelytrum erectum</i>	Long-awned woodgrass
	<i>Carex deweyana</i>	Dewey's Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex radiata</i>	Eastern Star Sedge
	<i>Carex sprengelii</i>	Sprengle's Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hackelia virginiana</i>	Stickseed
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Maianthemum canadensis</i>	Canada Mayflower
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Solidago flexicalis</i>	Zig-zag Goldenrod
	<i>Thalictrum dioicum</i>	Early Meadowrue

Natural Polygon ID	6C	MLCCS Code	32150
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Location	Scientific Name	Common Name
Ground cont.	<i>Trillium cernuum</i>	Nodding Trillium
	<i>Viburnum lentago</i>	Nannyberry Downy Yellow
	<i>Viola pubescens</i>	Violet
	<i>Viola sororia</i>	common Blue Violet

Notes: Maple Basswood Forest stand dominated by Tilia with Aspen clones with scattered trees and cut stumps. Tall straight trees. Heavy buckthorn infestation. Moderately good species diversity. Few Red Oak and Sugar Maple

Natural Polygon ID	6D	MLCCS Code	52430
Community Description	Willow Swamp	Quality Ranking	D
Field Check Level	4	Invasives	412-2, 406-1
Surveyor	AJR	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer sacharinum</i>	Silver Maple
	<i>Larex laricina</i>	Tamarack
Shrubs	<i>Cornus serecia</i>	Red Osier Dogwood
	<i>Ribes americanum</i>	Eastern Black Currant
	<i>Salix exigua</i>	Sandbar Willow
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Equisetum</i> sp.	Horsetail
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Willow Shrub Swamp with Reed Canary Grass common mixed with Lake Sedge and Hybrid Cattail. Scattered Silver Maple and Sandbar willow common. Isolated Tamarack present.

Natural Polygon ID	6E	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-5
Surveyor	AJR	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Fraxinus nigra</i>	Black Ash
	<i>Fraxinus pennsylvanica</i>	Green Ash
Subcanopy	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrubs	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex stipata</i>	Common Fox Sedge

Notes: Dense Buckthorn wet woods with widely scattered mature wet canopy trees

Natural Polygon ID	6F	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-6
Surveyor	AJR	Date	5/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Fraxinus nigra</i>	Black Ash
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Juniperus virginiana</i>	Eastern Red Cedar
	<i>Crataegus chrysoarpa</i>	Round Leaf Hawthorn
Shrubs	<i>Juniperus virginiana</i>	Eastern Red Cedar
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex Blanda</i>	Common Wood Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Circaea luteana</i>	Broad Leaved Enchanters Nightshade
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Galium triflorum</i>	Fragrant Bedstraw
	<i>Viola pubescens</i>	Downy Yellow Violet
<i>Viola sororia</i>	Hairy Wood Violet	

Notes:

Very degraded lowland hardwood forest. Logged, with thick buckthorn regrowth at all layers. Relatively rich ground layer diversity. Buckthorn is mostly mature with limited ground later reseeding.

Natural Polygon ID	6H	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	C
Field Check Level	4	Invasives	402-2, 406-4
Surveyor	AJR	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Acer sacharinum</i>	Silver Maple
Shrubs	<i>Cornus serecia</i>	Red Osier Dogwood
	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex lacustris</i>	Lake Sedge
	<i>Typha x glauca</i>	Hybrid Cattail
	<i>Lythrum salicaria</i>	Purple Loosestrife

Notes: Very wet sedge meadow community with scattered Green Ash and Silver Maple. Multiple flooded and dead trees are scattered throughout.

Natural Polygon ID	6I	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	B/C
Field Check Level	4	Invasives	408-2, 411-2
Surveyor	AJR	Date	5/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	Subcanopy	<i>Acer negundo</i>
<i>Acer saccharum</i>		Sugar Maple
<i>Fraxinus pennsylvanica</i>		Green Ash
<i>Ostrya virginiana</i>		Ironwood

Natural Polygon ID	6I	MLCCS Code	32112
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Location	Scientific Name	Common Name
Shrubs cont.	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickley Gooseberry
Ground	<i>Acer negundo</i>	Boxelder
	<i>Adiantum pedatum</i>	Maidenhair Fern
	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Allium tricoccum</i>	Wild Leek
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Brachyelytrum erectum</i>	Long Awned Wood Grass
	<i>Carex Blanda</i>	Common Wood Sedge
	<i>Carex hirtifolia</i>	Hairy Sedge
	<i>Carex pedunculata</i>	Long Stalked Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Circaea luteana</i>	Broad Leaved Enchanter's Nightshade
	<i>Dentaria laciniata</i>	Cut-leaved Toothwort
	<i>Galium triflorum</i>	Fragrant Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Geum canadense</i>	White Avens
	<i>Hachelia virginiana</i>	Stickseed
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Prenanthes alba</i>	White Lettuce
	<i>Ranunculus arboritis</i>	Small Flowered Crowfoot
	<i>Rhamnus cathartica</i>	Common Buckthorn
<i>Sanguinaria canadensis</i>	Bloodroot	
<i>Smalacina racemosa</i>	False Solomon's Seal	
<i>Smilax cf. Echirrata</i>	Upright Carrion Flower	
<i>Viola pubescens</i>	Downy Yellow Violet	

Notes: Mature, even aged Mesic Oak Forest with heavy Sugar Maple subcanopy. Diverse mix of woodland groundlayer species scattered. Ground layer vegetation generally very sparse with extensive exposed soils.

Natural Polygon ID	6J	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	B/C
Field Check Level	4	Invasives	408-2
Surveyor	AJR	Date	5/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Slippery Elm
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
Shrubs	<i>Cornus alternifolia</i>	Pagoda Dogwood
	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
Ground	<i>Adiantum pedatum</i>	Maidenhair Fern
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Brachyelytrum erectum</i>	Long Awned Wood Grass
	<i>Carex Blanda</i>	Common Wood Sedge
	<i>Carex hirtifolia</i>	Hairy Sedge
	<i>Carex pedunculata</i>	Long Stalked Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Circaea luteana</i>	Broad Leaved Enchanter's Nightshade
	<i>Dentaria laciniata</i>	Cut-leaved Toothwort
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Mattuccia struthiopteris</i>	Ostrich Fern
	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Ranunculus arboritis</i>	Small Flowered Crowfoot
<i>Smalacina racemosa</i>	False Solomon's Seal	
<i>Thalictrum dioicum</i>	Early Meadow Rue	
<i>Viola sp.</i>	Violet species	

Notes: Mature maple basswood forest dominated by sugar maple. Basswood confined to edge. Oaks scattered in canopy include both Red and White. Other canopy trees include Slippery Elm, Basswood, Green Ash. Areas of dense maple shade lack ground layer vegetation. Buckthorn heavy on western edge.

Natural Polygon ID	6K	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Juniperus virginiana</i>	Eastern Red Cedar
	<i>Ostrya virginiana</i>	Ironwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
	<i>Viburnum lentago</i>	Nannyberry
<i>Zanthoxylum americanum</i>	Prickley Ash	
Shrubs	<i>Prunus serotina</i>	Black Cherry
	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickley Gooseberry
Ground	<i>Sambucus pubens</i>	Scarlet Elderberry
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Aster cordifolius</i>	Heart Leaved Aster

Natural Polygon ID	6K	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Fragaria virginiana</i>	Wild Strawberry
	<i>Galium triflorum</i>	Fragrant Bedstraw
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Viola pubescens</i>	Downy Yellow Violet

Notes: Disturbed stand dominated by well spaced, large open-grown Bur Oak. Within matrix of young 4"-5" subcanopy trees, Basswood dominates. Matrix includes frequent young Red Oak. Saw one large Green Ash. Buckthorn seedlings are nearly continuous throughout. Parts have large buckthorn. Mesic forest herbaceous species present but sparse with low diversity. Cut over - could be mapped as disturbed/alterd or as D rank Mesic Oak. No Sugar Maple seen.

Natural Polygon ID	6L	MLCCS Code	52360
Community Description	Willow Swamp - Saturated Soils	Quality Ranking	C
Field Check Level	3	Invasives	402-2, 406-3, 412-3
Surveyor	AJR	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Acer sacharinum</i>	Silver Maple
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Saturated Willow Swamp with scattered Green Ash and Silver Maple. Flooded and dead trees are present. Ground layer dominated by sedges. Reed Canary limited by Shade

Natural Polygon ID	7A	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	D
Field Check Level	3	Invasives	412-2
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Phalaris arundinacea</i>	Reed Canary Grass

Notes: Small basin with saturated soils and standing water present with 40% coverage by Lake Sedge. Small patches of Reed Canary Grass on the margins. Remaining portion of basin is open water with dense Duckweed on the surface. Edges are dominated by Boxelder, Green Ash, Bitternut Hickory and Basswood.

Natural Polygon ID	7B	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	BC
Field Check Level	4	Invasives	408-2, 411-2
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubrum</i>	Red Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Red Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
Shrub	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Viburnum lentago</i>	Nannyberry
	<i>Actea rubra</i>	Red Baneberry
	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Brachyelytrum erectum</i>	Long Awned Wood Grass
	<i>Carex deweyana</i>	Dewey's Sedge

Natural Polygon ID	7B	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex pedunculata</i>	Long Stalked Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
		Three lobed
	<i>Galium trifidum</i>	bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
		Sharp Lobed
	<i>Hepatica acutiloba</i>	Hepatica
	<i>Laportea canadensis</i>	Wood Nettle

Notes: Mesic Oak forest dominated by mature, multi-stemmed Red Oak ~80-100 years old (resprouts from a clearcut). Large trees are fairly well spaced within a matrix of younger trees (20-30 cm dbh). Dense subcanopy cover of mostly Sugar Maple creates very dense shade. Herbaceous layer is moderate to low in diversity and sparse due to heavy shade. Small gaps have dense herbaceous cover. Alliaria present but confined to wetter soils on edges of basins.

Natural Polygon ID	7C	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	BC
Field Check Level	4	Invasives	412-2, 406-2
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Shrub	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Alisma subcordatum</i>	American Water Plantain
	<i>Bidens cernua</i>	Beggar's Ticks
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lacustris</i>	Lake Sedge
		Common Fox
	<i>Carex stipata</i>	Sedge
	<i>Glyceria grandis</i>	Reed Manna Grass
	<i>Leersia oryzopsis</i>	Rice Cut-grass
		Northern
	<i>Lycopus uniflorus</i>	Bugleweed
	<i>Lysimachia thrysiflora</i>	Swamp Loosestrife
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum sagittatum</i>	Arrow leaved Tearthumb
	<i>Scirpus atrovirens</i>	Dark Green Bulrush
	<i>Scirpus cyperinus</i>	Woolgrass
<i>Scutellaria galariculata</i>	Marsh Skullcap	
<i>Sparganium eurycarpum</i>	Common Bur Reed	
<i>Theliptris palustris</i>	Marsh Fern	
	Narrow Leaved	
<i>Typha angustifolia</i>	Cattail	

Notes: Wet Meadow in small basin dominated by Lake Sedge with small amounts of Reed Manna Grass, Bluejoint and Burreed. Moderate native diversity. Occasional, scattered willow. Much Polygonum present. Dense but narrow zone of Reed Canary Grass on edges. Water table just below the ground surface.

Natural Polygon ID	7D	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	A/B
Field Check Level	4	Invasives	412-2
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Ground	<i>Carex lacustris</i>	Lake Sedge
		Common Fox
	<i>Carex stipata</i>	Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Cicuta bulbosa</i>	Water Hemlock
		Cinnamon Willow
	<i>Epilobium cf coloratum</i>	Herb
	<i>Equisetum palustre</i>	Marsh Horsetail
	<i>Eupatorium maculatum</i>	Joe-Pye-Weed
	<i>Eupatorium perfoliatum</i>	Boneset
	<i>Galium sp.</i>	Bedstraw
	<i>Glyceria grandis</i>	Reed Manna Grass
	<i>Glyceria striata</i>	Fowl Manna Grass
	<i>Impatiens capensis</i>	Jewelweed
	<i>Lycopus americanus</i>	American Water-horehound
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Rumex orbiculatus</i>	Greater Water Dock
<i>Scirpus cyperinus</i>	Woolgrass	
<i>Scutellaria galariculata</i>	Marsh Skullcap	
<i>Sparganium eurycarpum</i>	Common Bur Reed	
<i>Theliptris palustris</i>	Marsh Fern	
<i>Typha sp.</i>	Cattail	

Notes: Floating Sedge Mat. Wet Meadow dominated by mix of Lake Sedge, Yellow Lake Sedge. Essentially undisturbed but for small cluster of Phalaris at south and north edges. Good native species diversity. Sphagnum present in middle. Woody plants very sparse (= Acer saccharum and Salix petiolaris).

Natural Polygon ID	7G	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-3
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Betula papyrifera</i>	Paper Birch
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	Ground	<i>Actea rubra</i>
<i>Alliaria petiolata</i>		Garlic Mustard
<i>Amphicarpaea bracteata</i>		Hog-peanut
<i>Arisaema triphyllum</i>		Jack in the Pulpit
<i>Athyrium filix-femina</i>		Lady Fern
<i>Brachyelytrum erectum</i>		Long Awned Wood Grass
<i>Carex deweyana</i>		Dewey's Sedge
<i>Carex gracillima</i>		Graceful Sedge
<i>Carex pedunculata</i>		Long Stalked Sedge
		Pennsylvania
<i>Carex pennsylvanica</i>		Sedge
<i>Carex rosea</i>		Rosey Sedge
<i>Circaea luteana</i>		Enchanter's Nightshade
		Three lobed
<i>Galium trifidum</i>		bedstraw
<i>Geranium maculatum</i>		Wild Geranium
	Sharp Lobed	
<i>Hepatica acutiloba</i>	Hepatica	
<i>Laportea canadensis</i>	Wood Nettle	

Notes: Maple Basswood forest dominated by scattered, old wolfy Sugar Maple and some Basswood and Red Oak. Within matrix of dense young Sugar Maple and Ironwood, frequent thin spots in canopy with dense Common Buckthorn. Abundant Pennsylvania Sedge in light gaps, indicative of past grazing. Canopy is very ragged. Oaks were mostly logged out in past.

Natural Polygon ID	7H	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-2, 411-2
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharinum</i>	Silver Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus nigra</i>	Black Ash
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
Shrubs	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sambucus pubens</i>	Scarlet Elderberry
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpet
		Narrow Leaved
	<i>Carex amphibola</i>	Sedge
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex rosea</i>	Rosy Sedge
		Broad Leaved Enchanters
	<i>Circaea luteana</i>	Nightshade
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Galium triflorum</i>	Fragrant Bedstraw
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Leersia virginica</i>	White Grass
	<i>Matteuchia struthiopteris</i>	Ostrich Fern
	<i>Menispermum canadensis</i>	Canada moonseed
	<i>Pilea pumila</i>	Canadian clearweed
	<i>Ranunculus arborivus</i>	Small Flowered Buttercup
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
		Upright Carrion
	<i>Smilax ecirrhata</i>	Flower
<i>Viola pubescens</i>	Downy Yellow Violet	
<i>Viola sororia</i>	Hairy Wood Violet	

Notes: Lowland Hardwood Forest dominated by scattered large Basswood and Green Ash. Very ragged canopy with lots of light penetration. Many young Basswood, As, Sugar Maple, Boxelder. Frequent thickets of Buckthorn. Garlic mustard present in large clumps. Good diversity of typical herbaceous flora. Severe streambank erosion along creek.

Natural Polygon ID	8A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Tilia americana</i>	Basswood
Ground	<i>Carex intumescens</i>	Greater Bladder Sedge
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf

Notes: Degraded woods dominated by widely spaced, open grown Bur Oak and Sugar Maple within a dense matrix of young Sugar Maple. Very heavy maple reproduction has produced dense shade causing virtually no herbaceous layer. Bare soils common. Woods are mostly immature, young trees. Heavy buckthorn present where there is more light reaching the ground along the western edge bordering large marshes. Badly eroded gullies present.

Natural Polygon ID	8C	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-4
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer nigrum</i>	Black Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus nigra</i>	Black Ash
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Rhamnus cathartica</i>	Common Buckthorn

Notes: Degraded woods. Scattered, few old trees present including an enormous White Oak. These all are open grown. Within matrix of young trees, Sugar Maple, Basswood, and American Elm. Some recent selective logging. Buckthorn present throughout is sparse in well shaded areas and very dense in areas of thin canopy cover. Parts in center are young trees with dense buckthorn understory. Low herbaceous diversity.

Natural Polygon ID	8D	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	CD
Field Check Level	4	Invasives	408-5
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer rubrum</i>	Red Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus nigra</i>	Black Ash
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus nigra</i>	Black Ash
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
Shrub Ground	<i>Ulmus americana</i>	American Elm
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Adiantum petadum</i>	Maidenhair Fern
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Asarum canadense</i>	Wild Ginger
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Botrychium virginianum</i>	Rattlesnake Fern
		Narrow Leaved Sedge
	<i>Carex amphibola</i>	Sedge
	<i>Carex blanda</i>	Common Woodland Sedge
	<i>Carex deweyana</i>	Dewey's Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Cryptotaenia canadensis</i>	Canada honewort
	<i>Glyceria striata</i>	Fowl Manna Grass
	<i>Rudbeckia laciniata</i>	Wild Goldenglow

Notes: Degraded Lowland Hardwood Forest dominated by young Black Ash, Basswood and Green Ash with some Red Maple, Elm and Sugar Maple present. Thin canopy cover. Dense infestation of Buckthorn. Low species diversity. All trees <30cm dbh.

Natural Polygon ID	9A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 412-1
Surveyor	FH	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
Ground	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arctium minor</i>	Common Burdock
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Festuca subverticillata</i>	Nodding Fescue
	<i>Galium triflorum</i>	Fragrant Bedstraw
	<i>Phryma leptostachya</i>	Lopseed

Notes: Narrow zone of mature dry-mesic woods on steep east facing slope. Dominated by large Oaks. Too narrow to have any interior forest - i.e. it is all edge. Fairly open and has dense Buckthorn. Much Prickley Ash and Burdock Present. Red tailed hawk nest present.

Natural Polygon ID	9B	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	C
Field Check Level	3	Invasives	412-4
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrubs	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ulmus americana</i>	American Elm
Ground		Creeping Bent
	<i>Agropyron stolonifera</i>	Grass
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Impatiens capensis</i>	Jewellweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Solidago gigantea</i>	Giant Goldenrod
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Verbena bracteata</i>	Creeping Vervain

Notes: Degraded wet meadow dominated by Lake Sedge. Scattered American Elm, Red Osier Dogwood, Salix Petiolaris. Low diversity surrounded by broad, dense zone of Reed Canary Grass. Reed Canary also scattered throughout central portion. Tussock Sedge common in parts.

Natural Polygon ID	9C	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-3
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus virginiana</i>	Chokecherry
Ground	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Aralia racemosa</i>	American Spikenard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Aster ontarionis</i>	Ontario Aster
	<i>Brachyelytrum erectum</i>	Long Awned Wood Grass
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Cryptotaenia canadensis</i>	Canadian Honewort
		Three lobed
	<i>Galium trifidum</i>	bedstraw
	<i>Laportea canadensis</i>	Wood Nettle
	<i>Osmunda clatonii</i>	Interrupted Fern
	<i>Phryma leptostachya</i>	Lopseed
	<i>Ranunculus abortivus</i>	Small Flowered Buttercup
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Sanicula marilandica</i>	Black Snakeroot
<i>Thalictrum dioicum</i>	Early Meadow Rue	
	Downy Yellow	
	<i>Viola pubescens</i>	Violet

Notes: Mature stand of nearly 90-95% Sugar Maple. Other gaps were logged out. Dense subcanopy of Sugar Maple. Heavy shade. Moderate to low herbaceous diversity. Portions cut over and lacking mature trees. Old cattle fences present.

Natural Polygon ID	9D	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrub	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Zanthoxylum americanum</i>	Prickley Ash
Ground	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Solidago flexicalis</i>	Zig Zag Goldenrod

Notes: Narrow strip of Oak - Basswood Forest with basswood dominant in canopy and subcanopy. Buckthorn heavy in subcanopy, shrub and ground layer. Garbage common throughout.

Natural Polygon ID	9E	MLCCS Code	52420
Community Description	Wet Meadow, Shrub Subtype	Quality Ranking	C
Field Check Level	4	Invasives	406-4, 412-2
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Shrub	<i>Cornus serotina</i>	Red Osier Dogwood Peach Leaved
	<i>Salix amygdaloides</i>	Willow
	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix petiolaris</i>	Meadow Willow
	<i>Sambucus canadensis</i>	Canada Elderberry White Meadow sweet
Ground	<i>Spiraea alba</i>	Swamp Milkweed
	<i>Asclepias incarnata</i>	Purple-stemmed
	<i>Aster puniceus</i>	Aster
	<i>Bidens Cernuum</i>	Nodding Beggar's Ticks
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Eleocharis sp.</i>	Spikerush
	<i>Epilobium leptophyllum</i>	American Marsh Willow Herb
	<i>Eupatorium perfoliatum</i>	Boneset
	<i>Impatiens capensis</i>	Jewellweed
	<i>Mentha arvensis</i>	Wild Mint
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum sagittatum</i>	Heart Leaved Tearthumb
	<i>Rumex crispus</i>	Curly Dock
<i>Rumex orbiculatus</i>	Great Water Dock	
<i>Sagittaria latifolia</i>	Broad Leaved Arrowhead	
<i>Thelypteris palustris</i>	Marsh Fern	
<i>Typha sp.</i>	Cattails	
<i>Verbena hastata</i>	Blue Vervain	

Notes: Wet Meadow, Shrub Subtype. Shrub cover approximately 50%. Shrub swamp is located between disturbed upland disturbed grassland and Wet Meadow too wet for shrub component. Openings dominated by Smartweeds and willow herb. Many dead shrubs throughout. Site appears to be restoration through removal/blocking of ditch.

Natural Polygon ID	9F	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	C
Field Check Level	4	Invasives	406-2
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed Purple-stemmed
	<i>Aster punecius</i>	Aster
	<i>Bidens Cernuum</i>	Nodding Beggar's Ticks
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Eleocharis sp.</i>	Spikerush
	<i>Epilobium leptophyllum</i>	American Marsh Willow Herb
	<i>Eupatorium perfoliatum</i>	Boneset
	<i>Impatiens capensis</i>	Jewellweed
	<i>Mentha arvensis</i>	Wild Mint
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum sagittatum</i>	Heart Leaved Tearthumb
	<i>Rumex crispus</i>	Curly Dock
	<i>Rumex orbiculatus</i>	Great Water Dock
	<i>Sagittaria latifolia</i>	Broad Leaved Arrowhead
<i>Theliptris palustris</i>	Marsh Fern	
<i>Typha sp.</i>	Cattails	
<i>Verbena hastata</i>	Blue Vervain	

Notes: Wet Meadow adjacent to open water with many dead, flooded trees spread throughout. Water level appears to have risen, possibly due to the blocking/removal of drainage system for closed adjacent golf course.

Natural Polygon ID	9G	MLCCS Code	61820
Community Description	Mixed Emergent Marsh	Quality Ranking	C
Field Check Level	4	Invasives	406-2, 412-2
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Bidens Cernuum</i>	Nodding Beggar's Ticks
	<i>Cicuta maculata</i>	Common Water Hemlock
	<i>Cyperus</i> sp.	Nut Sedge species
	<i>Eleocharis</i> sp.	Spikerush
	<i>Glyceria grandis</i>	Tall Manna Grass
	<i>Impatiens capensis</i>	Jewellweed
	<i>Leersia oryzoides</i>	Rice Cut Grass
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum sagittatum</i>	Heart Leaved Tearthumb
	<i>Sagittaria latifolia</i>	Broad Leaved Arrowhead
	<i>Scirpus cyperinus</i>	Woolgrass
<i>Typha</i> sp.	Cattails	

Notes: Unmaintained ditch vegetated throughout with Arrowhead, Tall Manna Grass, Beggar's Ticks and Duckweed. Floating vegetation clumps forming throughout the center deep water portions.

Natural Polygon ID	9H	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-3
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Prunus serotina</i>	Black Cherry
	<i>Tilia americana</i>	Basswood
Shrub	<i>Cornus sericea</i>	Red Osier Dogwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Vitis riparia</i>	Riverbank Grape
	<i>Zanthoxylum americanum</i>	Prickly Ash
Ground	<i>Anemone canadensis</i>	Canada anemone
	<i>Aster punecius</i>	Purple Stemmed Aster
	<i>Bromus inermis</i>	Smooth Brome
		Woodland
	<i>Helianthus strumosus</i>	Sunflower
	<i>Thalictrum dioicum</i>	Early Meadow Rue

Notes: Very small Oak forest remnant located between large wetland complex and disturbed grassland, abandoned golf course. Remnant is all edge. Mature Basswood and Red Oak dominate. Abundant woodland and open grassland weeds abundant throughout.

Natural Polygon ID	9I	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-3
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sambucus canadensis</i>	Canada Elderberry
	<i>Vitis riparia</i>	Riverbank Grape
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
		Canada Wood
	<i>Laportea canadensis</i>	Nettle
	<i>Pilea luteana</i>	Clearweed
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus radicans</i>	Poison Ivy

Notes: Lowland hardwood forest located between housing and abandoned golf course. Cut over with even-aged young trees in canopy. Canopy a mix of species.

Natural Polygon ID	9J	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-3
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus alba</i>	White Oak
Subcanopy	<i>Ostrya virginiana</i>	Ironwood
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Carex blanda</i>	Common Wood Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Elymus hystrix</i>	Bottlebrush Grass
	<i>Parthenocissus inserta</i>	Woodbine

Notes: Disturbed Maple Basswood Forest on steep slopes above small ravine. Site is bounded by housing development and school. Large Maples dominate the lower portions near stream. Upper portion cut over in past and now dominated almost entirely by mix of Bitternut Hickory and Ironwood.

Natural Polygon ID	9K	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-3
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubrum</i>	Red Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer rubrum</i>	Red Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrub	<i>Corylus americana</i>	Hazelnut
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes americana</i>	Prickly Gooseberry
	<i>Viburnum lentago</i>	Nannyberry
Ground	<i>Anemonella thalictroides</i>	Rue-anemone
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
		Enchanter's
	<i>Circaea luteana</i>	Nightshad
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Prunus serotina</i>	Black Cherry
		False Solomon's
	Seal	

Notes: Mesic Oak Forest dominated by White Oak separated from 4A by railroad berm. Occasional Red Oak, Green Ash in canopy. Well-spaced, large trees. Scattered old, well rotted cut stumps. Dense matrix subcanopy-sized trees mostly *Ostrya* and *Acer sacharum*. Virtually no shrubs present. Ground layer very sparse and depauperate. Low diversity. Buckthorn more or less absent. Basswood very rare.

Natural Polygon ID	10A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	A/B
Field Check Level	4	Invasives	408-2, 411-2
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus nigra</i>	Black Ash
	<i>Juglans nigra</i>	Black Walnut
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Red Elm
Subcanopy	<i>Acer rubrum</i>	Red Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrub	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
Ground	<i>Adiantum petadum</i>	Maidenhair Fern
	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arisaema triphyllum</i>	Jack in the Pulpet
		Narrow Leaved
	<i>Carex amphibola</i>	Sedge
	<i>Carex blanda</i>	Common Woodland Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Leersia virginica</i>	White Grass
	<i>Matteuchia struthiopteris</i>	Ostrich Fern

Natural Polygon ID	10A	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Osmorhiza Claytonii</i>	Bland Sweet Cicily
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Phryma leptostachya</i>	Lopseed
	<i>Ranunuculus arbortivus</i>	Small Flowered Buttercup
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort
	<i>Viola pubescens</i>	Downy Yellow Violet

Notes: Nice mature forest dominated by Red Oak commonly 60+ cm dbh (~100-120 years old). White Oak occasional in canopy. Basswood rare. Dense heavy sapling and subcanopy tree cover by Sugar Maple creates heavy shade. A fine example of our native woods in which oaks were not selectively removed in the past. Nesting Red Tailed Hawk present. Some Oaks reach 70cm dbh. Sugar Maple is absent from most of canopy except at toe slope where it is present. Some badly eroded gullies on slopes. Southern end of woods has more abundant Sugar Maple. Garlic Mustard in small patches on edge of much of toe slope.

Natural Polygon ID	10B	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 411-2
Surveyor	FH	Date	6/28/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus alba</i>	White Oak
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Populus tremuloides</i>	Quaking Aspen Three Lobed
Ground	<i>Galium trifidum</i>	Bedstraw
	<i>Osmorhiza Claytonii</i>	Bland Sweet Cicily

Notes: Highly degraded woods. Scattered open grown, widely spaced Oaks in dense matrix of small young trees (mostly Ironwood). No real forest canopy present. Dense continuous cover of Buckthorn. Seedlings carpet the ground throughout on Southwest facing slope. Low Diversity.

Natural Polygon ID	10C	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-3
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus nigra</i>	Black Ash
	<i>Juglans nigra</i>	Black Walnut
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Red Elm
Subcanopy	<i>Amelanchier laevis</i>	Allegheny Serviceberry
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Celtis occidentalis</i>	Hackberry
	<i>Juglans nigra</i>	Black Walnut
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
	<i>Vitis riparia</i>	Riverbank Grape
Shrub	<i>Lonicera tatarica</i>	Tatarian Honeysuckle
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Zanthoxylum americana</i>	Prickly Ash
Ground	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Anemone virginiana</i>	thimbleweed
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Bromus inermis</i>	Smooth Brome
	<i>Carex blanda</i>	Common Woodland Sedge
		Pennsylvania Sedge
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Cirsium vulgare</i>	Bull Thistle
	<i>Elymus canadensis</i>	Canada Wild Rye
	<i>Galium aparine</i>	Cleavers
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Hystrix patula</i>	Bottlebrush Grass
<i>Osmorhiza Claytonii</i>	Bland Sweet Cicily	

Natural Polygon ID	10C	MLCCS Code	32150
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Location	Scientific Name	Common Name
Ground cont.	<i>Parthenocissus inserta</i>	Woodbine
	<i>Phryma leptostachya</i>	Lopseed
	<i>Rubus</i> sp.	Raspberry species
	<i>Sanicula marilandica</i>	Black Snakeroot
	<i>Solidago flexicalis</i>	Zig Zag Goldenrod
	<i>Vitis riparia</i>	Riverbank Grape

Notes: Very steeply sloping knoll between interstate 694 and open water wetland. Cut over woods with variable quality throughout. Some areas heavily disturbed and cut over dominated by Ironwood. Other portions relatively undisturbed with Sugar Maple, Red Oak and Bur Oak dominant. Large canopy trees widely scattered of all varieties. No tree type dominant throughout. Buckthorn common at edges and heavy areas where canopy has been opened. Garbage common throughout. Soil disturbance is common, apparently relating to past freeway construction. Disturbance species typical of open areas common in these areas (Smooth Brome, Thistle).

Natural Polygon ID	10F	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-3, Barberry-2
Surveyor	FH	Date	7/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus grandidentata</i>	Big Toothed Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus ellipsoidalis</i>	Northern Pin Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
Shrub	<i>Berberis thunbergii</i>	Japanese Barberry
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus toxicodendron</i>	Poison Ivy
	<i>Ribes cynosbati</i>	Prickley Gooseberry
	<i>Zanthoxylum americana</i>	Prickley Ash
Ground	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Carex blanda</i>	Common Woodland Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
		Three lobed bedstraw
	<i>Galium trifidum</i>	bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hackelia virginiana</i>	Stickseed
	<i>Osmorhiza Claytonii</i>	Bland Sweet Cicily
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Smilax ecirrhata</i>	Upright Carrion Flower
<i>Thalictrum dioicum</i>	Early Meadow Rue	

Notes: Oak Forest dominated by open-grown White Oak with much Red Oak. Trees will spaced apart due to past selective logging. Occasional Green Ash and Basswood in canopy. Large Big Toothed Aspen clones present. Interrupted canopy cover with much light penetration. High subcanopy and shrub cover. Abundant Buckthorn, Prickly Ash throughout. Rhamnus is mostly small seedlings. Moderate diversity of herbaceous layer vegetation but sparse in shaded areas. Past grazing. Parts of site are C rank, others D rank. No Sugar Maple present. Tiny Wetland basin at North and South solid Reed Canary Grass.

Natural Polygon ID	10G	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-5
Surveyor	FH	Date	7/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus ellipsoidal</i>	Northern Pin Oak
	<i>Quercus rubra</i>	Red Oak
Shrub	<i>Cornus racemosa</i>	Gray Dogwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Zanthoxylum americana</i>	Prickley Ash

Notes: Scruffy thicket of small *Quercus rubra* and *Prunus serotina* with 1-2 large, open grown *Quercus ellipsoidal*. Dense thickets of shrubs dominate.

Natural Polygon ID	11A	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	C
Field Check Level	4	Invasives	402-2, 406-4, 412-2
Surveyor	FH	Date	6/13/2006

Location	Scientific Name	Common Name
Shrub	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Asclepias incarnata</i>	Marsh Milkweed
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex comosa</i>	Bottlebrush Sedge
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
		Bulbous Water
	<i>Cicuta bulbosa</i>	Hemlock
	<i>Eleocharis palustris</i>	Common Spikerush
	<i>Eupatorium maculatum</i>	Joe-Pye-Weed
	<i>Lycopus americanus</i>	American Water-horehound
	<i>Lycopus uniflorus</i>	Northern Bugleweed
	<i>Lysimachia thyrsiflora</i>	Swamp Loosestrife
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Muhlenbergia glomerata</i>	Marsh Muhly
	<i>Polygonum sagittatum</i>	Arrow leaved Tearthumb
	<i>Sagittaria grandifolia</i>	Arrowhead

Natural Polygon ID	11A	MLCCS Code	61641
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Location	Scientific Name	Common Name
Ground cont.	<i>Scirpus validus</i>	Soft Stem Bulrush
	<i>Thelypteris palustris</i>	Marsh Fern
	<i>Triadenum fraseri</i>	Bog St. John's Wort
	<i>Typhya angustifolia</i>	Narrow Leaved Cattail

Notes: Floating mat wetland in shallow basin. Outermost edges dominated by Reed Canary Grass. Eastern 1/2 has dense Typha angustifolia. West 1/2 has open sedge community dominated by Carex utriculata, Carex lacustris and Thelypteris palustris. Good diversity native wetland species present, including abundant Swamp Loosestrife, Arrowhead and Bog St. John's wort. Purple Loosestrife present nearly throughout, scattered 5-10 feet between plants. Floating sedge mat in need of Loosestrife control. Surveyor broke through and hit bottom. Basin is not very deep.

Natural Polygon ID	12B	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-3, Honeysuckle - 2
Surveyor	FH	Date	7/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubrum</i>	Red Maple
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer rubrum</i>	Red Maple
	<i>Amelanchier</i> sp.	Serviceberry
	<i>Betula papyrifera</i>	Paper Birch
	<i>Ostrya virginiana</i>	Ironwood
	<i>Quercus rubra</i>	Red Oak
Shrub	<i>Cornus racemosa</i>	Gray Dogwood
	<i>Corylus americana</i>	American Hazel
	<i>Lonicera tatarica</i>	Tatarian Honeysuckle
	<i>Prunus virginiana</i>	Common Chokecherry
Ground	<i>Rhamnus cathartica</i>	Buckthorn
	<i>Rubus</i> sp.	Raspberry
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge

Natural Polygon ID	12B	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Fragaria virginiana</i>	Wild Strawberry
	<i>Galium trifidum</i>	Three lobed bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Juncus cf tenuis</i>	Path Rush
	<i>Poa compressa</i>	Canada Bluegrass
	<i>Smilacina racemosa</i>	False Solomon's Seal
	<i>Smilax herbacea</i>	Common Carrion Flower
	<i>Toxicodendron rydbergii</i>	Western Poison Ivy

Notes: Mesic Oak Forest dominated by large, widely spaced, open grown White Oak with much Red Oak and Northern Pin Oak. Dense matrix of subcanopy trees include mostly Ironwood. Parts are fairly open and have high shrub cover, other parts well shaded due to Ironwood and have little shrub or herbaceous cover. Moderately low diversity. Pennsylvania Sedge is highly abundant in parts. Formerly heavily grazed. Now has dirt bike trails. Past selective logging.

Natural Polygon ID	12C	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	A
Field Check Level	4	Invasives	406-2, 402-2
Surveyor	AJR	Date	9/4/2006

Location	Scientific Name	Common Name
Shrub	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Salix amygdaloides</i>	Peach Leaf Willow
	<i>Salix pedicularis</i>	Bog Willow
	<i>Spiraea tomentosa</i>	Steeplebush
Ground	<i>Bidens cernua</i>	Beggar's Ticks
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex comosa</i>	Bottlebrush Sedge
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex lasiocarpa</i>	Wirgrass Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Eleocharis</i> sp.	A species of Spikerush
	<i>Eupatorium perfoliatum</i>	Boneset
	<i>Iris versicolor</i>	Blueflag Iris
		Narrow Panicle
	<i>Juncus brevicaudatus</i>	Rush
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Mentha arvensis</i>	Wild Mint
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Polygonum sagittatum</i>	Arrow leaved Tearthumb
	<i>Potentilla palustre</i>	Marsh Cinquefoil
	<i>Rumex crispus</i>	Curly Dock
	<i>Sagittaria grandifolia</i>	Arrowhead
	<i>Scirpus cyperinus</i>	Woolgrass
<i>Sphagnum</i> sp.	Sphagnum Moss	
<i>Thelypteris palustris</i>	Marsh Fern	
<i>Typhya x glauca</i>	Hybrid Cattail	

Notes: High quality floating mat wetland dominated by sedges and marsh fern on floating sphagnum. High diversity throughout with minimal invasive species present. Reed Canary Grass located at dry/mineral soils on margins. Cattails and Purple Loosestrife present, but minimal.

Natural Polygon ID	12D	MLCCS Code	61820
Community Description	Mixed Emergent Marsh - Permanently Flooded	Quality Ranking	C
Field Check Level	3	Invasives	412-2, 406-2
Surveyor	AJR	Date	9/4/2006

Location	Scientific Name	Common Name
Shrub	<i>Salix exigua</i>	Sandbar Willow
Ground	<i>Alisma gramineum</i>	Grass-leaved Water Plantain
	<i>Alisma subcortatum</i>	Water Plantain
	<i>Bidens cernua</i>	Beggar's Ticks
	<i>Calamagrostis canadensis</i>	Canada Blue-joint
	<i>Carex utriculata</i>	Common Yellow Lake Sedge
	<i>Glyceria grandis</i>	Tall Manna Grass
	<i>Juncus effusus</i>	Soft Rush
	<i>Leersia oryzoides</i>	Rice Cut Grass
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Sagittaria latifolia</i>	Arrowhead
	<i>Scirpus cyperinus</i>	Woolgrass
	<i>Scirpus validus</i>	Soft Stem Bulrush
	<i>Sparganium eurycarpum</i>	Common Bur-reed
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Shallow open water wetland with mixed floating mat and rooted bottom vegetation. Native species dominate throughout.

Natural Polygon ID	13A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-2, 410 -2
Surveyor	FH	Date	7/6/2006

Location	Scientific Name	Common Name	
Canopy	<i>Acer negundo</i>	Boxelder	
	<i>Fraxinus pennsylvanica</i>	Green Ash	
	<i>Populus deltoides</i>	Cottonwood	
	<i>Populus tremuloides</i>	Quaking Aspen	
	<i>Prunus serotina</i>	Black Cherry	
	<i>Quercus alba</i>	White Oak	
	<i>Quercus macrocarpa</i>	Bur Oak	
	<i>Quercus rubra</i>	Red Oak	
	<i>Tilia americana</i>	Basswood	
	Subcanopy	<i>Acer saccharum</i>	Sugar Maple
<i>Betula papyrifera</i>		Paper Birch	
<i>Fraxinus pennsylvanica</i>		Green Ash	
<i>Juglans cinerea</i>		Butternut	
<i>Ostrya virginiana</i>		Ironwood	
<i>Prunus serotina</i>		Black Cherry	
<i>Tilia americana</i>		Basswood	
<i>Ulmus americana</i>		American Elm	
Shrub		<i>Acer ginnala</i>	Amur Maple
			Tatarian
	<i>Lonicera tatarica</i>	Honeysuckle	
	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Rhus toxicodendron</i>	Poison Ivy	
		Missouri	
	<i>Ribes missouriensis</i>	Gooseberry	
	<i>Rubus idaeas</i>	American Red Raspberry	
	<i>Sambucus pubens</i>	Scarlet Elderberry	
	<i>Viburnum trilobum</i>	Highbush Cranberry	
Ground	<i>Zanthoxylum americana</i>	Prickley Ash	
	<i>Actea rubra</i>	Red Baneberry	
	<i>Amphicarpaea bracteata</i>	Hog-peanut	
	<i>Arctium minor</i>	Common Burdock	
	<i>Arisaema triphyllum</i>	Jack in the Pulpit	
	<i>Aster cordifolius</i>	Heart Leaved Aster	
	<i>Carex blanda</i>	Common Woodland Sedge	
	<i>Carex deweyana</i>	Dewey's Sedge	
	<i>Carex gracillima</i>	Graceful Sedge	
		Pennsylvania	
<i>Carex pennsylvanica</i>	Sedge		
<i>Carex rosea</i>	Rosey Sedge		
<i>Carex spengelii</i>	Sprengel's Sedge		

Natural Polygon ID

13A

MLCCS Code

32112

Location	Scientific Name	Common Name
Ground cont.	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Cryptotaenia canadensis</i>	Canada honewort
	<i>Desmodium glutinosum</i>	Pointed Tick-trefoil
	<i>Galium boreale</i>	Northern Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Phryma leptostachya</i>	Lopseed
	<i>Polygonatum commutatum</i>	Giant Solomon's Seal
	<i>Ranunculus abortivus</i>	Small Flowered Buttercup
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Sanicula marilandica</i>	Black Snakeroot
	<i>Smilacina racemosa</i>	False Solomon's Seal
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Viola pubescens</i>	Downy Yellow Violet
<i>Viola sororia</i>	common Blue Violet	

Notes: An Oak Basswood forest dominated by open grown White Oak with Red Oak and Basswood subdominant. Interrupted, thin canopy. Dense subcanopy of mostly Basswood, Green Ash and Ironwood. High shrub cover in canopy thin spots. Good abundance and diversity of native herbaceous cover. Sugar Maple is present, but very rare. Thinned forest is Oak forest likely due to cutting. *Juglans cinerea* is present but dying out. Poor forest structure but good diversity. Paved trails present some erosion problems in ravines. Parts lack mature trees.

Natural Polygon ID	15B	MLCCS Code	52420
Community Description	Shrub Swamp	Quality Ranking	D
Field Check Level	4	Invasives	406-3, 412-3
Surveyor	AJR	Date	7/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ulmus americana</i>	American Elm
Shrub	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Typhya angustifolia</i>	Narrow Leaved Cattail

Notes: Disturbed shrub swamp dominated by Meadow Willow with trees common. Much invasion by *Typha angustifolia* and *Phalaris arundinacea*

Natural Polygon ID	16B	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	B
Field Check Level	4	Invasives	408-2, 410-2
Surveyor	FH	Date	7/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubrum</i>	Red Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Acer rubrum</i>	Red Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
	<i>Ulmus rubra</i>	Red Elm
Shrub	<i>Cornus alternifolia</i>	Pagoda Dogwood
	<i>Lonicera tatarica</i>	Tatarian Honeysuckle

Natural Polygon ID	16B	MLCCS Code	32112
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Location	Scientific Name	Common Name
Shrub cont.	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Actea rubra</i>	Red Baneberry
	<i>Anemonella thalictroides</i>	Rue Anemone
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Asarum canadense</i>	Wild Ginger
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Sanicula marilandica</i>	Black Snakeroot
	<i>Thalictrum dioicum</i>	Early Meadow Rue Downy Yellow
	<i>Viola pubescens</i>	Violet

Notes: Small, mature stand dominated by forest grown Red Oak and White Oak with frequent Red Oak. Sugar Maple present as occasional saplings. Mature trees 50-60cm dbh (~80-100 years old). High subcanopy cover. Much shade. Sparse herbaceous cover due to shade. Overall a nice quality stand but very small and surrounded by horses. Buckthorn and Tatarian Honeysuckle are present but very sparse. Several tree houses present.

Natural Polygon ID	16D	MLCCS Code	32112
Community Description	Mesic forest, Oak Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	AJR	Date	9/6/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Shrub	<i>Quercus rubra</i>	Red Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Zanthoxylum americanum</i>	Prickly Ash
Ground	<i>Aster drummondii</i>	Heart Leaved Aster
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Hackelia virginiana</i>	Stickseed
	<i>Osmorhiza clatonii</i>	Sweet Cicily
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Prunus serotina</i>	Black Cherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Smilax tamnoides</i>	Greenbrier

Notes: Mesic Oak Forest with widely scattered open grown red oaks dominating the canopy. Subcanopy comprised of close, evenly spaced Basswood and Green Ash. Shrub layer heavily infested with Common Buckthorn. Forest soils heavily compacted with many trails and bike paths dissecting the stand. High restoration potential with removal of buckthorn.

Natural Polygon ID	17A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-2, 412-2
Surveyor	AJR	Date	7/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash Common
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Xanthoxylum americanum</i>	Prickly Ash
Ground	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Vitis riparia</i>	Riverbank Sedge

Notes: Maple Basswood Forest with abundant ground litter, but limited ground layer diversity. Sugar maple dominated with little else in canopy. Vary mature sugar maples common throughout. Stream meanders through stand. Incised but not highly eroded.

Natural Polygon ID	17B	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-2, 411-4, 412-3
Surveyor	AJR	Date	7/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Fraxinus pennsylvanica</i>	Green As
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Arctium minor</i>	Common Burdock
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Circeum vulgare</i>	Bull Thistle
	<i>Galium aparine</i>	Cleavers
	<i>Geranium maculatum</i>	Wild Geranium
		False Rue
	<i>Isopyrum biternatum</i>	Anemone
	<i>Osmorhiza claytonii</i>	Sweet Cicely
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Phalaris arundinacea</i>	Reed Canary Grass
<i>Pilea lutea</i>	Clearweed	

Natural Polygon ID	17B	MLCCS Code	32220
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Location	Scientific Name	Common Name
Ground cont.	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Urtica dioica</i>	Stinging Nettle
		Downy Yellow
	<i>Viola pubescens</i>	Violet
	<i>Vitis riparia</i>	Riverbank Grape

Notes: Low quality lowland hardwood forest with diverse overstory remnant trees common. Bitternut Hickory abundant in canopy. Garlic mustard forms nearly pure ground cover in areas. Site located between the edge of a large Reed Canary Grass dominated wetland and steeply sloping (filled) backyards. Garbage common along slope.

Natural Polygon ID	17C	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	
Surveyor	AJR	Date	7/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus nigra</i>	Black Ash
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
Shrubs	<i>Tilia americana</i>	Basswood
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Allium tricoccum</i>	Wild Leek
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Lactuca</i> sp.	Wild Lettuce
	<i>Vitis riparia</i>	Riverbank Grape

Notes: Low quality, fragmented maple forest with a few scattered mature maples. Sugar Maple dominated all layers. Erosion, dumping and compacted/eroded foot paths common. Typical Invasive species absent.

Natural Polygon ID	17D	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-2
Surveyor	AJR	Date	

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
Shrub	<i>Acer saccharum</i>	Sugar Maple Common
	<i>Prunus virginiana</i>	Chokecherry
Ground	<i>Amelanchier laevis</i>	Allegheny Serviceberry
	<i>Acer saccharum</i>	Sugar Maple
	<i>Actea rubra</i>	Red Baneberry
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Asarum canadense</i>	Wild Ginger
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Carex blanda</i>	Common Woodland Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hydrophyllum virginianum</i>	Virginia Waterleaf
	<i>Laportea canadensis</i>	Wood Nettle
	<i>Leersia virginica</i>	White Grass
	<i>Parthenocissus inserta</i>	Woodbine Common
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhus radicans</i>	Poison Ivy
	<i>Sambucus canadensis</i>	Canada Elderberry False Solomon's
	<i>Smilacina racemosa</i>	Seal
<i>Solidago flexicalis</i>	Zig-zag Goldenrod	

Notes: Very small remnant Maple Basswood Forest stand. Scattered large, open grown Red Oaks common in the canopy. Sugar Maple dominates remainder of canopy, subcanopy and ground layer. Dissected by bike and foot paths, both paved and unpaved. Weed species minimal. May have been Oak forest previously, but Oaks no longer dominant.

Natural Polygon ID	18A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	3	Invasives	
Surveyor	AJR	Date	7/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
Shrubs	<i>Acer saccharum</i>	Sugar Maple
	<i>Xanthoxylum americanum</i>	Prickly Ash
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Allium tricoccum</i>	Wild Leek
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex sprengelii</i>	Sprengel's Sedge
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Circaea luteana</i>	Enchanter's Nightshade
	<i>Dryopteris gymnocarpium</i>	Wood Fern
	<i>Elymus hystrix</i>	Bottlebrush Grass
	<i>Lactuca</i> sp.	Wild Lettuce
	<i>Laportea canadensis</i>	Wood Nettle
<i>Menospermum canadense</i>	Canada Moonseed	
<i>Vitis riparia</i>	Riverbank Grape	

Notes: Sugar bush stand with permanent taps in place linking all large sugar maples to sugar production facility. Ground layer vegetation limited by light in core areas, thicker at edge.

Natural Polygon ID	20A	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	C
Field Check Level	4	Invasives	412-4
Surveyor	AJR	Date	6/14/2006

Location	Scientific Name	Common Name
Canopy	<i>Salix nigra</i>	Black Willow
Shrub	<i>Salix exigua</i>	Sandbar Willow
Ground	<i>Alyssa plantago aquatica</i>	Water Plantain
	<i>Bidens cernua</i>	Beggar's Ticks
	<i>Carex lasiocarpa</i>	Wiregrass Sedge
	<i>Carex lurida</i>	Lurid Sedge
	<i>Carex retrorsa</i>	Retrorse Sedge
	<i>Carex</i> sp. (Ovales type)	Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Cicuta maculata</i>	Common Water-hemlock
	<i>Glyceria canadensis</i>	Rattlesnake-manna grass
	<i>Impatiens</i> sp.	Jewellweed
	<i>Lemna minor</i>	Duckweed
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Scirpus cyperinus</i>	Woolgrass
	<i>Scirpus fluviatilis</i>	River Bulrush
	<i>Solanum dulcamara</i>	Bittersweet Nightshade

Notes: Open wet depression surrounded by woods. Center dominated by *Carex retrorsa*. Edge dominated by Reed Canary Grass. Minimal standing water on June 14 survey.

Natural Polygon ID	20C	MLCCS Code	61520
Community Description	Mixed Emergent Marsh - seasonally flooded	Quality Ranking	D
Field Check Level	4	Invasives	412-3, 406-3, 402-3
Surveyor	AJR	Date	7/13/2006

Location	Scientific Name	Common Name
Canopy	<i>Salix nigra</i>	Black Willow
	<i>Cornus serotina</i>	Red Osier Dogwood
Shrub	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix petiolaris</i>	Meadow Willow
	<i>Sambucus canadensis</i>	Elderberry
	<i>Acorus calamus</i>	Sweet Flag
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Bidens cernua</i>	Beggar's Ticks
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex</i> sp. (Ovales type)	Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Eupatorium maculatum</i>	Spotted Joe-Pye Weed
	<i>Eupatorium perfoliatum</i>	Common Boneset
	<i>Glyceria grandis</i>	Tall Mannagrass
	<i>Impatiens capensis</i>	Jewellweed
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Mentha arvensis</i>	Field Mint
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Polygonum sagittatum</i>	Arrow-leaved Tearthumb
	<i>Rumex crispus</i>	Curly Dock
	<i>Sagittaria latifolia</i>	Broad Leaved Arrowhead
<i>Typha x glauca</i>	Hybrid Cattail	
<i>Verbena hastata</i>	Blue Vervain	

Notes: Poor quality wetland with a variety of native species persisting, but dominated by a mix of aggressive non-native species and native smartweeds.

Natural Polygon ID	20D	MLCCS Code	61520
Community Description	Mixed Emergent Marsh - seasonally flooded	Quality Ranking	C
Field Check Level	4	Invasives	406-3, 402-3
Surveyor	AJR	Date	7/13/2006

Location	Scientific Name	Common Name
Ground	<i>Acorus calamus</i>	Sweet Flag
	<i>Alysm plantago-aquatica</i>	Water Plantain
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Glyceria grandis</i>	Tall Mannagrass
	<i>Impatiens capensis</i>	Jewellweed
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Polygonum sagittatum</i>	Arrow-leaved Tearthumb
	<i>Sagittaria latifolia</i>	Broad Leaved Arrowhead
	<i>Scirpus fluviatilis</i>	River Bulrush
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Moderate quality emergent wetland surrounded by dense cattail marsh and disturbed lowland forest at edges. Native River Bulrush, Lake Sedge, Tussock Sedge and Sweet Flag each dominate as large patches throughout. Some Willows are present, but do not dominate. *Typha x glauca* present throughout.

Natural Polygon ID	20E	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D (very small)
Field Check Level	3	Invasives	
Surveyor	AJR	Date	7/5/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer sacharum</i>	Sugar Maple
	<i>Tilia americana</i>	Basswood
	<i>Ulmus pumila</i>	Siberian Elm
Subcanopy	<i>Acer sacharum</i>	Sugar Maple
	<i>Tilia americana</i>	Basswood
Shrubs	<i>Acer sacharum</i>	Sugar Maple
	<i>Tilia americana</i>	Basswood
Ground	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex stipata</i>	Common Fox Sedge
	<i>Erigeron strigosus</i>	Daisy Fleabane
	<i>Menospermum canadensis</i>	Canada Moonseed
	<i>Parhenocissus inserta</i>	Woodbine
	<i>Verbascum thapsis</i>	Mullien
	<i>Vitis riparia</i>	Riverbank Grape

Notes: Very small remnant in one small, undeveloped vacant lot and thin backyards. Sugar maple dominant at all layers. Thick shrubby/vine edge with almost no ground cover in core (very dark).

Natural Polygon ID	21A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	408-2, 411-2
Surveyor	AJR	Date	7/5/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Acer negundo</i>	Boxelder
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Quercus rubra</i>	Red Oak
Shrubs	<i>Ulmus rubra</i>	Red Elm
	<i>Acer saccharum</i>	Sugar Maple
	<i>Sambucus pubens</i>	Scarlet elderberry
Ground	<i>Tilia americana</i>	Basswood
	<i>Acer saccharum</i>	Sugar Maple
	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Arctium minor</i>	Common Burdock
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex disperma</i>	Two Seeded Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Fraxinus pennsylvanica</i>	Green Ash
		Sharp Lobed
	<i>Hepatica acutiloba</i>	Hepatica
	<i>Leonaris cardiaca</i>	Motherwort
	<i>Osmorhiza claytonii</i>	Sweet Cicely
	<i>Parhenocissus inserta</i>	Woodbine
<i>Solanum dulcamara</i>	Bittersweet Nightshade	
<i>Uvularia grandiflora</i>	Large Flowered Bellwort	
<i>Vitis riparia</i>	Riverbank Grape	

Notes: Nearly pure Sugar Maple dominated stand. Sugar maple dominates all layers. Ground layer vegetation sparse in core, thick on western edge. Eastern portion of wooded area has been sodded over and is mowed as part of city park.

Natural Polygon ID	22A	MLCCS Code	52420
Community Description	Wet Meadow, shrub subtype	Quality Ranking	B
Field Check Level	4	Invasives	406-2, 412-2
Surveyor	AJR	Date	5/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix petiolaris</i>	Meadow Willow
	<i>Spiraea alba</i>	Meadowsweet
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Calamagrostis canadensis</i>	Canada Blue Joint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex lasiocarpa</i>	Wire Grass Sedge
	<i>Carex stipata</i>	Common Fox Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Epilobium</i> sp.	Willow Herb
	<i>Iris versicolor</i>	Blue Flag Iris
	<i>Lycopus americanus</i>	American Water-Horehound
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Scirpus acutus</i>	Hardstem Bulrush
	<i>Thelyptis palustris</i>	Marsh Fern
<i>Typha x glauca</i>	Hybrid Cattail	

Notes: High quality Shrub wetland somewhat isolated by storm sewer and drainage networks by ditch spoil berm. Very diverse herbaceous layer persists on sphagnum mats and within shrub shading.

Natural Polygon ID	22B	MLCCS Code	52520
Community Description	Wet Meadow, shrub subtype	Quality Ranking	B
Field Check Level	4	Invasives	406-2, 412-2
Surveyor	AJR	Date	5/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix petiolaris</i>	Meadow Willow
	<i>Spirea alba</i>	Meadowsweet
Ground	<i>Acorus calamus</i>	Sweetflag
	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Calamagrostis canadensis</i>	Canada Blue Joint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex lasiocarpa</i>	Wire Grass Sedge
		Common Fox Sedge
	<i>Carex stipata</i>	Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Cicuta maculata</i>	Common Water Hemlock
	<i>Epilobium</i> sp.	Willow Herb
	<i>Iris versicolor</i>	Blue Flag Iris
	<i>Lycopus americanus</i>	American Water-Horehound
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Osmunda regalis</i>	Royal Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Potentilla palustris</i>	Marsh Cinquefoil
	<i>Scirpus acutus</i>	Hardstem Bulrush
	<i>Thelyptis palustris</i>	Marsh Fern
<i>Viola blanda</i>	Sweet White Violet	

Notes: Floating Mat Sedge/Shrub community with sphagnum dominating ground layer and sedge hummocks.

Natural Polygon ID	22C	MLCCS Code	52420
Community Description	Wet Meadow, shrub subtype	Quality Ranking	C/D
Field Check Level	4	Invasives	412-4
Surveyor	AJR	Date	5/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix</i> sp.	Shrub Willow Species
	<i>Spiraea alba</i>	Meadowsweet
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Calamagrostis canadensis</i>	Canada Blue Joint
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex lasiocarpa</i>	Wire Grass Sedge
	<i>Carex stipata</i>	Common Fox Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Epilobium</i> sp.	Willow Herb
	<i>Iris versicolor</i>	Blue Flag Iris
	<i>Lycopus americanus</i>	American Water-Horehound
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Scirpus acutus</i>	Hardstem Bulrush
<i>Thelyptis palustris</i>	Marsh Fern	
<i>Typha x glauca</i>	Hybrid Cattail	

Notes: Shrub Swamp dominated by sedges in herbaceous layer. Reed Canary common.

Natural Polygon ID	22D	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	411-3, 408-6
Surveyor	AJR	Date	5/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Celtis occidentalis</i>	Hackberry
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Ulmus americana</i>	American Elm
Shrub	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Symphoricarpos albus</i>	Snowberry
	<i>Xanthoxylum americanum</i>	Prickly Ash
Ground	<i>Acer negundo</i>	Boxelder
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Parthenocisus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Vitis riparia</i>	Riverbank Grape

Notes: Very disturbed oak forest with very large open grown oaks nearly exclusive in the canopy. Understory limited to weedy shrub species. Limited herbaceous species present.

Natural Polygon ID	22E	MLCCS Code	52420
Community Description	Wet Meadow, Shrub subtype	Quality Ranking	C
Field Check Level	4	Invasives	412-2, 406-2
Surveyor	AJR	Date	5/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Salix nigra</i>	Black Willow
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Salix exigua</i>	Sandbar Willow Shrub Willow
	<i>Salix</i> sp.	Species
	<i>Sambucus canadensis</i>	Elderberry
	<i>Viburnum trilobum</i>	Highbush Cranberry
Ground	<i>Caltha palustris</i>	Marsh Marigold
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Equisetum</i> sp.	Horsetail
	<i>Impatiens</i> sp.	Jewellweed
	<i>Iris versicolor</i>	Blue Flag Iris
	<i>Lycopus americanus</i>	American Water-Horehound
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Scirpus acutus</i>	Hardstem Bulrush
	<i>Thelypteris palustris</i>	Marsh Fern
<i>Typha x glauca</i>	Hybrid Cattail	
<i>Viola</i> sp.	Violet	

Notes: Shrub Subtype Wet Meadow with a diverse mix of shrub and herbaceous vegetation. Squeezed between developed trails, housing and cattail dominated stormwater management wetland. Though seeps are present along foot path, hydrology appears to be largely dominated by stormwater inputs from uplands.

Natural Polygon ID	22F	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	408-3, 411-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Carya cordiformis</i>	Bitter-nut Hickory
	<i>Ulmus rubra</i>	Slippery Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ulmus americana</i>	American Elm
	<i>Vitis riparia</i>	Riverbank Grape
Shrubs	<i>Acer saccharum</i>	Sugar Maple Common
	<i>Prunus virginiana</i>	Chokecherry
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Woodland Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carya cordiformis</i>	Bitter-nut Hickory Pennsylvania
	<i>Cerex pennsylvanica</i>	Sedge
	<i>Elymus hystrix</i>	Bottlebrush Grass
	<i>Galium aparine</i>	Cleavers
	<i>Gymnocarpium dryopteris</i>	Common wood fern
	<i>Leonurus cardiaca</i>	Motherwort
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Parthenocissus quinquefolia</i>	Virginia Creeper
<i>Ribes cynosbati</i>	Prickley Gooseberry	
<i>Sanguinaria</i>	Bloodroot	

Notes: Moderate to poor quality maple basswood forest with a few very mature sugar maples in overstory. Ground later vegetation dominated by invasive and edge species. Mixed aged stand. Garlic mustard and buckthorn limited to edges.

Natural Polygon ID	22G	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-3, 411-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Populus deltoides</i>	Cottonwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Salix nigra</i>	Black Willow
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Slippery Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus virginiana</i>	Choke Cherry
Shrubs	<i>Populus deltoides</i>	Cottonwood Common
	<i>Prunus virginiana</i>	Chokecherry
	<i>Ribes cynosbati</i>	Prickley Gooseberry
	<i>Sambucus pubens</i>	Red-berried elder
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Woodland Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Impatiens</i> sp.	Jewellweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass

Notes: Small remnant, mature maple basswood forest with mixed canopy located along meandering stream. Wet tree species confined to stream edge. Mixed age stand contains a variety of mature trees at canopy level to ground layer including a few pre-settlement oaks and sugar maple. Ground layer vegetation sparse under dense canopy of maples, thick at the edge and near stream. Stream meanders intact with somewhat eroded banks. Stream cobbled visible with little visible evidence of siltation present in stream.

Natural Polygon ID	22H	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-2, 411-2
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Slippery Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
Shrubs	<i>Prunus virginiana</i>	Chokecherry
	<i>Symphoricarpos alba</i>	Snowberry
	<i>Arctium minus</i>	Common Burdock
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpet
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex sprengeii</i>	Sprengel's Sedge
	<i>Glechoma hederacea</i>	Creeping Charlie
	<i>Gymnocarpium drypteris</i>	Wood Fern
		False lily of the valley
	<i>Mainantherum canadense</i>	valley
	<i>Parthenocisus inserta</i>	Woodbine
		Common
	<i>Prunus virginiana</i>	Chokecherry
	<i>Viola</i> sp.	Violet species

Notes: Remnant, mature maple basswood forest with mixed canopy dominated by basswood and maple. *Prunus virginiana* dominates shrub layer.

Natural Polygon ID	221	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-3, 411-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Slippery Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
Shrubs	<i>Prunus virginiana</i>	Chokecherry
	<i>Symphoricarpos alba</i>	Snowberry
	<i>Arctium minus</i>	Common Burdock
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpet
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex sprengeii</i>	Sprengel's Sedge
	<i>Glechoma hederacea</i>	Creeping Charlie
	<i>Gymnocarpium drypteris</i>	Wood Fern
		False lily of the valley
	<i>Mainanthemum canadense</i>	valley
	<i>Parthenocisus inserta</i>	Woodbine
		Common
	<i>Prunus virginiana</i>	Chokecherry
<i>Viola</i> sp.	Violet species	

Notes: Remnant, mature maple basswood forest with mixed canopy dominated by basswood and maple. *Prunus virginiana* dominates shrub layer. Disconnected forest separated from 22H by stormwater pond and associated fill mound.

Natural Polygon ID	22J	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-3, 411-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Slippery Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
Shrubs	<i>Prunus virginiana</i>	Chokecherry
	<i>Symphoricarpos alba</i>	Snowberry
	<i>Arctium minus</i>	Common Burdock
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpet
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex sprengeii</i>	Sprengel's Sedge
	<i>Glechoma hederacea</i>	Creeping Charlie
	<i>Gymnocarpium drypteris</i>	Wood Fern
		False lily of the valley
	<i>Mainantheum canadense</i>	valley
	<i>Parthenocisus inserta</i>	Woodbine
		Common
	<i>Prunus virginiana</i>	Chokecherry
<i>Viola</i> sp.	Violet species	

Notes: Remnant, mature maple basswood forest with mixed canopy dominated by basswood and maple. Forest is bisected by 8' wide bituminous walking paths. Mixed age, sugar maple dominated forest. 6 story office building shades southern portion of site.

Natural Polygon ID	22K	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	3	Invasives	417-2, 408-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
Shrub	<i>Acer saccharum</i>	Sugar Maple
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rubus sp.</i>	Raspberry
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Alliaria officinalis</i>	Garlic Mustard
	<i>Aquilegia canadensis</i>	Wild Columbine
	<i>Carex blanda</i>	Common Wood Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex sprengelii</i>	Sprengel's Sedge
	<i>Carya cordiformis</i>	Bitternut Hickory
	<i>Menospermum canadense</i>	Canada Moonseed
	<i>Parthenocisus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickley Gooseberry
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod
<i>Tilia americana</i>	Basswood	
<i>Uvularia grandiflora</i>	Bellwort	

Notes: Small remnant sugar maple dominated stand with dense canopy shading. Ground layer vegetation sparse except at edges. Some garlic mustard and buckthorn present at edges, but limited.

Natural Polygon ID	22L	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-2, HS - 2
Surveyor	AJR	Date	

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
Shrub	<i>Fraxinus pennsylvanica</i>	Green Ash
		Tatarian
	<i>Lonicera tatarica</i>	Honeysuckle Common
	<i>Prunus virginiana</i>	Chokecherry
	<i>Tilia americana</i>	Basswood
Ground	<i>Allium tricoccum</i>	Wild Leek
	<i>Carex blanda</i>	Common Wood Sedge Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex sprengelii</i>	Sprengel's Sedge
	<i>Caulophyllum thalictroides</i>	Blue Cohosh Woodland
	<i>Helianthus strumosus</i>	Sunflower
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry Common
	<i>Smilax tamnoides</i>	Greenbriar
	<i>Solidago flexicalis</i>	Zig-zag Goldenrod
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort

Notes: Moderate quality Maple Basswood Forest with Basswood dominance in Overstory. Steeply sloping upland forest located between parking lots and stream. City trail located along western edge. Stream bank bare and steep, but not highly eroded. Forest floor vegetation and duff layers sparse. Mixed age trees throughout, dominated by basswood. Buckthorn and Honeysuckle limited to edge along trail and parking area.

Natural Polygon ID	23A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	
Surveyor	AJR	Date	5/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Tilia americana</i>	Basswood
Shrub	<i>Acer saccharum</i>	Sugar Maple
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Aquilegia canadensis</i>	Columbine
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Sambucus canadensis</i>	Elderberry
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Tilia americana</i>	Basswood
	<i>Tilia americana</i>	Basswood
		Large leaved
	<i>Uvularia grandiflora</i>	Bellwort
<i>Viola pubescens</i>	Downy Wood Violet	

Notes: Sugar maple dominated forest on steep north facing slopes. Sugar maple dominates all vertical layers. Very little ground layer vegetation present throughout stand. A handful of large red oaks and basswood are present in the canopy.

Natural Polygon ID	23B	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-2
Surveyor	AJR	Date	5/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Acer sacharinum</i>	Silver Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Betula papyrifera</i>	Paper Birch
	<i>Ulmus americana</i>	American Elm
	<i>Vitis riparia</i>	Riverbank Grape
Shrub	<i>Cornus sericea</i>	Red Osier Dogwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus typhina</i>	Staghorn Sumac
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Impatiens capensis</i>	Jewelweed
	<i>Laportea canadensis</i>	Wood Nettle
	<i>Parthenocisus inserta</i>	Virginia Creeper
	<i>Viola pubescens</i>	Downy Wood Violet

Notes: Lowland hardwood forest with open water in spring. Cottonwood dominates overstory. Some weed species present.

Natural Polygon ID	23C	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Ostrya virginiana</i>	Ironwood
	<i>Acer saccharum</i>	Sugar Maple
Shrub	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Actea rubra</i>	Red Baneberry
Ground	<i>Allium tricoccum</i>	Wild Leek
	<i>Amphicarpaea bracteata</i>	Hog-peanut
	<i>Arctium minor</i>	Common Burdock
	<i>Arisaema triphyllum</i>	Jack in the Pulpet
	<i>Botrychium virginianum</i>	Rattlesnake Fern
	<i>Carex blanda</i>	Common Woodland Sedge
	<i>Carex disperma</i>	Two Seeded Bog Sedge
		Pennsylvania Sedge
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Carex sprengelii</i>	Sprengel's Sedge
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
	<i>Galium boreale</i>	Northern Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hdrophyllum virginianum</i>	Virginia waterleaf
	<i>Juglans nigra</i>	Black Walnut
		Canada Wood
	<i>Laportea canadensis</i>	Nettle
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Ranunculus arbortivus</i>	Small Flowered Buttercup
<i>Sanguinaria canadensis</i>	Bloodroot	
<i>Thalictrum dioicum</i>	Early Meadow Rue	
<i>Tilia americana</i>	Basswood	
<i>Uvularia grandiflora</i>	Large Flowered Bellwort	

Notes: Maple Basswood forest located along Medicine Lake Penninsula. Mixed age stand with Sugar Maple dominating regrowth. Lowland trees present hear shore and wetlands

Natural Polygon ID	23D	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-3
Surveyor	AJR	Date	6/5/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Ulmus rubra</i>	Red Elm
	<i>Ostrya virginiana</i>	Ironwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ulmus rubra</i>	Red Elm
Shrub	<i>Vitis riparia</i>	Riverbank Grape
	<i>Acer negundo</i>	Boxelder
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Rubus allegheniensis</i>	Blackberry
Ground	<i>Sambucus canadensis</i>	Common Elderberry
	<i>Viburnum trilobum</i>	Highbush Cranberry
	<i>Acer negundo</i>	Boxelder
	<i>Arisaema triphylum</i>	Jack-in-the-Pulpit
	<i>Artemisia minor</i>	Common Burdock
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Circaea lutiana</i>	Enchanter's Nightshade
	<i>Gallium aparine</i>	Cleavers
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Laportea canadensis</i>	Wood Nettle
<i>Pilea lutea</i>	Clearweed	
<i>Ranunculus abortivus</i>	Small Flowered Buttercup	
<i>Rudbeckia laciniata</i>	Wild Goldenglow	

Notes: Lowland Hardwood Forest at the edge of Medicine Lake. Mixed age stand dominated by Green Ash, Basswood, Cottonwood in overstory with Boxelder dominated shrub and ground layer vegetation.

Natural Polygon ID	23E	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	C/D
Field Check Level	4	Invasives	406-3, 402-3, 417-2
Surveyor	AJR	Date	7/13/2006

Location	Scientific Name	Common Name
Shrub	<i>Salix exigua</i>	Sandbar Willow
Ground	<i>Alysm plantago-aquatica</i>	Water Plantain
	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Galium asprellum</i>	Rough Bedstraw
	<i>Lythrum salicaria</i>	Purple Loosestrife
		Common Reed
	<i>Phragmites australis</i>	Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Potentilla palustris</i>	Marsh Cinquefoil
	<i>Saggitaria latifolia</i>	Broad Leaved Arrowhead
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Floating mat at the edge of Medicine Lake. Phragmites(native variety) common, but not dominant.

Natural Polygon ID	23F	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	408-2
Surveyor	AJR	Date	6/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
Shrub	<i>Acer saccharum</i>	Sugar Maple
	<i>Acer saccharum</i>	Sugar Maple
Ground	<i>Carex blanda</i>	Common Wood Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea lutiana</i>	Enchanter's Nightshade
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
		Large Leaved
	<i>Uvularia grandiflora</i>	Bellwort

Notes: Maple dominated forest with Sugar Maple dominating all layers. Low diversity due to shading and Sugar Maple dominance.

Natural Polygon ID	23G	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	408-2
Surveyor	AJR	Date	6/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Tilia americana</i>	Basswood
Shrub Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Acer saccharum</i>	Sugar Maple
	<i>Carex blanda</i>	Common Wood Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Circaea lutiana</i>	Enchanter's Nightshade
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
		Large Leaved
<i>Uvularia grandiflora</i>	Bellwort	

Notes: Maple dominated forest with Sugar Maple dominating all layers. Low diversity due to shading and Sugar Maple dominance. Edge was cut for stormwater basin. At edges and openings, sugar maple thicket has formed dense edge. Bare Soil common.

Natural Polygon ID	23H	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	408-2, 411-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Juglans nigra</i>	Black Walnut
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus rubra</i>	Slippery Elm
Subcanopy	<i>Celtis occidentalis</i>	Hackberry
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Cornus serocia</i>	Red Osier Dogwood
		Tatarian
	<i>Lonicera tatarica</i>	Honeysuckle
		Common
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Symphoricarpos alba</i>	Snowberry
	<i>Tilia americana</i>	Basswood
	<i>Viburnum trilobum</i>	Highbush Cranberry
	<i>Xanthoxylum americanum</i>	Prickley Ash
Ground	<i>Actea rubra</i>	Red Baneberry
	<i>Amphicarpaea bracteata</i>	Hog Peanut
	<i>Arctium minus</i>	Common Burdock
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Circaea lutiana</i>	Enchanter's Nightshade
	<i>Clematis virginiana</i>	Virgin's Bower
	<i>Elymus hystrix</i>	Bottlebrush Grass
	<i>Erigeron strigosus</i>	Daisy Fleabane
	<i>Glechoma hederacea</i>	Creeping Charlie
	<i>Gymnocarpium drypteris</i>	Wood Fern
	<i>Hemerocalis sp.</i>	Day Lily

Natural Polygon ID	23H	MLCCS Code	32150
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Location	Scientific Name	Common Name
Ground cont.	<i>Hemerocalis</i> sp.	Day Lily
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Mainanthemum canadense</i>	False lily of the valley
	<i>Parthenocisus inserta</i>	Woodbine
	<i>Rubus</i> sp.	Raspberry
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort

Notes: Mixed age and species stand with scattered oak, sugar maple. Ground layer vegetation thick near numerous footpaths dominated by Woodbine. Highly variable stand with areas of mature trees in multiaged conditions to young, pioneer species dominated areas.

Natural Polygon ID	231	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	C
Field Check Level	4	Invasives	412-2, 406-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Shrubs	<i>Cornus amomum</i>	Silky Dogwood
	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Salix discolor</i>	Pussy Willow
	<i>Salix petiolaris</i>	Meadow Willow
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Caltha palustris</i>	Marsh Marigold
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex Ovales type</i>	Ovales type sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Equisetum sp.</i>	Horsetail
	<i>Glyceria grandis</i>	Reed Manna Grass
	<i>Impatiens sp.</i>	Jewellweed
	<i>Iris versicolor</i>	Blue Flag Iris
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Potamogeton sp.</i>	Pondweed
	<i>Rumex crispus</i>	Curly Dock
	<i>Scutellaria galericulata</i>	Marsh Skullcap
<i>Thelyptis palustris</i>	Marsh Fern	
<i>Typha x glauca</i>	Hybrid Cattail	

Notes: Medicine Lake backwater bay wetland dominated by Canada Bluejoint and Lake Sedge. Phalaris dominates on both lake side and wooded slope sides. Center portion of bay too wet for Reed Canary dominance. Highly diverse native mix of wetland species.

Natural Polygon ID	24A	MLCCS Code	61620
Community Description	Mixed emergent Marsh	Quality Ranking	C/D
Field Check Level	3	Invasives	412-3, 406-2,
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Impatiens</i> sp.	Jewelweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Scirpus fluviatilis</i>	River Bulrush
	<i>Sparganium eurycarpum</i>	Common Bur-reed
	<i>Thelypteris palustris</i>	Marsh Fern
	<i>Typhya x glauca</i>	Hybrid Cattail
	<i>Verbena hastata</i>	Blue Vervain

Notes: Bur Reed and River Bulrush dominated basin surrounded by residential development. Reed Canary and Hybrid Cattails dominate eastern portion of wetland.

Natural Polygon ID	24B	MLCCS Code	61620
Community Description	Mixed Emergent Marsh	Quality Ranking	C/D
Field Check Level	4	Invasives	412-2, 406-3
Surveyor	AJR	Date	7/5/2006

Location	Scientific Name	Common Name
Canopy	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Salix nigra</i>	Black Willow
Shrub	<i>Salix exigua</i>	Sandbar willow
Ground	<i>Alisma subcordatum</i>	Water Plantain
	<i>Carex lacustris</i>	Lake Sedge
	<i>Glyceria grandis</i>	Reed Manna Grass
	<i>Impatiens</i> sp.	Jewelweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Polygonum sagittatum</i>	Arrow Leaved Tear Thumb
	<i>Sagittaria latifolia</i>	Broad Leaved Arrowhead
	<i>Scirpus cyperinus</i>	Woolgrass
	<i>Scirpus validus</i>	Soft Stem Bulrush
	<i>Typhya x glauca</i>	Hybrid Cattail

Notes: Wetland basin in city park backs up to residential backyards with narrow woodland buffer. Lake sedge community with mixed emergent vegetation dominates partially shaded areas near wooded buffer. Reed Canary Grass and cattails dominate edge near mowed lawn of city park.

Natural Polygon ID	24C	MLCCS Code	32112
Community Description	Mesic Oak Forest	Quality Ranking	B/C
Field Check Level	4	Invasives	
Surveyor	AJR	Date	6/23/2006

Location	Scientific Name	Common Name
Canopy	<i>Celtis occidentalis</i>	Hackberry
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Acer rubrum</i>	Red Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
Shrub	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus virginiana</i>	Chokecherry
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Viburnum trilobum</i>	Highbush Cranberry
	<i>Xanthoxylum americanum</i>	Prickly Ash
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Actea rubra</i>	Red Baneberry
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
	<i>Circaea luteana</i>	Enchanter's Nightshade
		Canadian Wood
	<i>Laportea canadensis</i>	Nettle
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Pilea lutea</i>	Clearweed
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod
	<i>Thalictrum dioicum</i>	Early Meadowrue
	<i>Trillium</i> sp.	Trillium Species
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort
<i>Viola pubescens</i>	Downy Wood Violet	

Notes: Mature Mesic Oak Forest in transition to sugar maple. Old growth Red and White Oaks are abundant. Subcanopy, shrub and ground layer dominated by Sugar Maple and Green Ash. Where light is available. Diverse woodland flowers dominate dense woodland areas under large oaks.

Natural Polygon ID	24E	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	
Surveyor	AJR	Date	7/5/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Celtis occidentalis</i>	Hackberry
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus rubra</i>	Red Oaki
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
Shrub	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Sambucus canadensis</i>	Elderberry
	<i>Sambucus racemosa</i>	Scarlet Elderberry
Ground	<i>Allium tricoccum</i>	Wild Leek
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Circaea luteana</i>	Enchanter's Nightshade
		Canadian Wood
	<i>Laportea canadensis</i>	Nettle
	<i>Viola pubescens</i>	Downy Wood Violet

Notes: Maple Basswood Forest with small ravine through center. Construction activities on large school at north end of site contributing sediment and degraded soils. Dumping common along construction margins. Sloping hillsides dominated by sugar maple seedlings ("Oskars"). Abundant trails, heavily compacted soils and rills common. Mature maples common throughout.

Natural Polygon ID	26A	MLCCS Code	52420
Community Description	Wet Meadow, Shrub Subtype	Quality Ranking	C
Field Check Level	4	Invasives	412-2, 408-3
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Shrub	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Fraxinus nigra</i>	Black Ash
	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix petiolaris</i>	Red Osier Dogwood
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Impatiens</i> sp.	Jewelweed
	<i>Lyrthrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Typhya x glauca</i>	Hybrid Cattail

Notes: Diverse shrub swamp on peninsula of Medicine Lake. Red Osier Dogwood dominated shrub layer. Ground layer dominated by native sedges and Canada Bluejoint. Reed Canary Grass dominates northern edge.

Natural Polygon ID	26B	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	408-2, 411-3, 409-2,
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name	
Canopy	<i>Acer negundo</i>	Boxelder	
	<i>Acer saccharum</i>	Sugar Maple	
	<i>Celtis occidentalis</i>	Hackberry	
	<i>Fraxinus nigra</i>	Black Ash	
	<i>Fraxinus pennsylvanica</i>	Green Ash	
	<i>Populus deltoides</i>	Cottonwood	
	<i>Quercus macrocarpa</i>	Bur Oak	
	<i>Salix nigra</i>	Black Willow	
	<i>Tilia americana</i>	Basswood	
	<i>Ulmus americana</i>	American Elm	
Subcanopy	<i>Acer negundo</i>	Boxelder	
	<i>Tilia americana</i>	Basswood	
Shrub	<i>Cornus sericea</i>	Red Osier Dogwood	
	<i>Prunus virginiana</i>	Chokecherry	
	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Rhus typhina</i>	Staghorn Sumac	
	<i>Sambucus canadensis</i>	Elderberry	
	<i>Tilia americana</i>	Basswood	
	<i>Xanthoxylum americanum</i>	Prickly Ash	
	Ground	<i>Alliaria officinalis</i>	Garlic Mustard
		<i>Aquilegia canadensis</i>	Columbine
		<i>Arisaema triphyllum</i>	Jack in the Pulpit
<i>Artium minus</i>		Common Burdock	
<i>Carex blanda</i>		Common Wood Sedge	
<i>Carex gracillima</i>		Graceful Sedge	
<i>Carex pennsylvanica</i>		Pennsylvania Sedge	
<i>Carex rosea</i>		Rosy Sedge	
<i>Carex sprengelii</i>		Sprengel's Sedge	
<i>Euphorbia esula</i>		Leafy Spurge	
<i>Geranium maculatum</i>		Wild Geranium	
<i>Hydrophyllum virginiana</i>		Virginia Waterleaf	
<i>Isopyrum biternatum</i>		False Meadow Rue	
<i>Menispermum canadense</i>		Canada Moonseed	
<i>Parthenocisus inserta</i>		Woodbine	
<i>Phalaris arundinacea</i>	Reed Canary Grass		
<i>Poa palustris</i>	Kentucky Bluegrass		

Natural Polygon ID	26B	MLCCS Code	32150
Location	Scientific Name	Common Name	
Ground cont.	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Rudbeckia laciniata</i>	Wild Goldenglow	
	<i>Smilax</i> sp.	Greenbrier	
	<i>Thelypteris palustris</i>	Marsh Fern	
	<i>Tilia americana</i>	Basswood	
	<i>Viola pubescens</i>	Downy Wood Violet	

Notes: Basswood dominated hardwood forest located on a high point on Medicine Lake penninsula. Some invasive species (burdock) present but not dominant. A few mature sugar maples, bur oak and Basswood present. Old home site in center. Cut over areas within polygon dominated by weed species, particularly leafy spurge, Burdock and Kentucky Bluegrass. Good restoration site.

Natural Polygon ID	26C	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-2, 412 - 2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Salix cf. Alba</i>	White Willow
	<i>Salix cf. Nigra</i>	Black Willow
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Arctium minus</i>	Burdock
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpet
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Galium sp.</i>	Bedstraw
	<i>Mattucia struthiopteris</i>	Ostrich Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Pilea lutea</i>	Clearweed
	<i>Rudbeckia laciniata</i>	Wild Goldenglow
	<i>Thalictrum dioicum</i>	Early Meadowrue
	<i>Thelypteris palustris</i>	Marsh Fern
	<i>Urtica dioica</i>	Stinging Nettle

Notes: Wet woods with mostly willow and box elder overstory. Many weed species on the ground layer. Relatively open subcanopy and shrub layer.

Natural Polygon ID	26D	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	C
Field Check Level	3	Invasives	412-4, 406-3
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Shrub	<i>Salix</i> sp.	A Shrub Willow
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Eleocharis</i> sp.	A species of Spikerush
	<i>Impatiens</i> sp.	Jewelweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Scirpus validus</i>	Soft Stem Bulrush
	<i>Thelypteris palustris</i>	Marsh Fern
	<i>Typhya x glauca</i>	Hybrid Cattail
	<i>Urtica dioica</i>	Stinging Nettle

Notes: Floating mat wetland with stong Reed Canary Grass presence at upper fringes with mixed sedges, spikerush, bulrushes at water's edge. High potential for restoration.

Natural Polygon ID	26E	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	B/C
Field Check Level	4	Invasives	408-4
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Tilia americana</i>	Basswood
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sambucus canadensis</i>	Elderberry
	<i>Tilia americana</i>	Basswood
Ground	<i>Alliaria officinalis</i>	Garlic Mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex vulpinoidea</i>	Fox Sedge
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rudbeckia laciniata</i>	Wild Goldenglow
	<i>Thelypteris palustris</i>	Marsh Fern
	<i>Tilia americana</i>	Basswood
	<i>Urtica dioica</i>	Stinging Nettle
	<i>Viola pubescens</i>	Downy Wood Violet

Notes: Lowland Hardwood Forest in transition to boxelder/buckthorn dominated stand. Mixed canopy includes bur oak, black ash, cottonwood and american elm. Soils transition from peat to rich loamy sand in transition from floating mat wetland up lowland hardwood slopes. Ground layer is dominated by a rich, thick duff layer. Good lowland forest restoration potential.

Natural Polygon ID	26-F	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	D
Field Check Level	4	Invasives	412-5
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Salix alba</i>	White Willow
Shrub	<i>Cornus serotina</i>	Red-osier Dogwood
	<i>Rhamnus columnifera</i>	Glossy Buckthorn
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Impatiens</i> sp.	Jewelweed
	<i>Lemna</i> sp.	Duckweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass

Notes: Reed Canary Grass heavy stream delta at the shores of Medicine Lake. Wettest areas dominated by Tussock and Lake Sedge

Natural Polygon ID	26G	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	4	Invasives	417-2, 408-3
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubra</i>	Red Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer sacharum</i>	Sugar Maple
	<i>Acer negundo</i>	Boxelder
	<i>Ostrya virginiana</i>	Ironwood
Shrub	<i>Acer negundo</i>	Boxelder
	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Actea rubra</i>	Red Baneberry
	<i>Alliaria officinalis</i>	Garlic Mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Galium</i> sp.	Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Glechoma hederacea</i>	Creeping Charlie
	<i>Hemerocallis fulva</i>	Day Lily
	<i>Parthenocisus inserta</i>	Woodbine
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Thalictrum dioicum</i>	Early Meadowrue
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Tilia americana</i>	Basswood
	<i>Trillium</i> sp.	Trillium species
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort
<i>Viola pubescens</i>	Downy Wood Violet	

Notes: Mixed Hardwood with mixed age trees. Subcanopy and shrub layers dominated by American Elm, Green Ash and Boxelder. Some Buckthorn present. Garlic mustard concentrated heavy near 24th Street. Lots of erosion and gullyng on slopes.

Natural Polygon ID	26H	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	417-2, 408-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
Shrub	<i>Acer negundo</i>	Boxelder
	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Ribes</i> sp.	Gooseberry
	<i>Ulmus americana</i>	American Elm
Ground	<i>Acer saccharinum</i>	Silver Maple
	<i>Alliaria officinalis</i>	Garlic Mustard
	<i>Arctium minus</i>	Burdock
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Glechoma hederacea</i>	Creeping Charlie
	<i>Hydrophyllum virginiana</i>	Virginia Waterleaf
	<i>Parthenocissus inserta</i>	Woodbine
		Japanese
	<i>Polygonum cuspidatum</i>	Knotweed
	<i>Populus deltoides</i>	Cottonwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rudbeckia lacineata</i>	Wild Goldenglow
	<i>Solanum dulcamara</i>	Bittersweet Nightshade
	<i>Tilia americana</i>	Basswood

Notes: Lowland Hardwood Forest with mixed age trees. Subcanopy and shrub layers dominated by American Elm, Green Ash and Boxelder. Some Buckthorn present. Garlic mustard concentrated heavy near 24th Street. Lots of erosion and gullying on slopes.

Natural Polygon ID	26-I	MLCCS Code	61420
Community Description	Wet Meadow - semipermanently flooded	Quality Ranking	D
Field Check Level	3	Invasives	412-4, 406-4
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Salix alba tristis</i>	Weeping Willow
Shrub Ground	<i>Salix exigua</i>	Sandbar Willow
	<i>Carex lacustris</i>	Lake Sedge
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Typhya x glauca</i>	Hybrid Cattail
	<i>Urtica dioica</i>	Stinging Nettle

Notes: Emergent wetland dominated by Lake Sedge, Reed Canary Grass and Hybrid Cattail with scattered Green Ash and Willow. Leaf and grass clipping dumping is filling northern edge at 24th and Magnolia.

Natural Polygon ID	26-J	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	3	Invasives	417-4
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Picea glauca</i>	White Spruce
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Betula papyrifera</i>	Paper Birch
	<i>Ostrya virginiana</i>	Ironwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Vitis riparia</i>	Riverbank Grape

Natural Polygon ID	26-J	MLCCS Code	32150
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Location	Scientific Name	Common Name
Shrub cont.	<i>Corylus americana</i>	American Hazel
	<i>Crataegus sp</i>	Hawthorn Tatarian
Ground	<i>Lonicera tatarica</i>	Honeysuckle
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Xanthoxylum americanum</i>	Prickly Ash
	<i>Actea rubra</i>	Red Baneberry
	<i>Alliaria officinalis</i>	Garlic Mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex gracilima</i>	Graceful Sedge Pennsylvania Sedge
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex sp.</i>	A Sedge Species
	<i>Carex sprengeii</i>	Sprengel's Sedge
	<i>Carex stipata</i>	Fox Sedge
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
	<i>Dryopteris intermedia</i>	Wood Fern
	<i>Galium apparine</i>	Bedstraw
	<i>Galium concinnum</i>	Shining Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Glechoma hederacea</i>	Creeping Charlie
	<i>Hemerocallis fulva</i>	Day Lily
	<i>Laportea canadensis</i>	Wood Nettle
	<i>Mattueccia struthiopteris</i>	Ostrich Fern
<i>Osmunda cinnamomea</i>	Cinnamon Fern	
<i>Parthenocissus inserta</i>	Woodbine	
<i>Phalaris arundinacea</i>	Reed Canary Grass	
<i>Ranunculus abortivus</i>	Small-flowered Crowfoot	
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rubus sp.</i>	Raspberry False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Trillium sp.</i>	Trillium species
	<i>Urtica dioica</i>	Stinging Nettle
	<i>Uvularia grandiflora</i>	Bellwort

Notes: Forested slopes along a ravine. Canopy of mixed hardwood forest trees. Private yards have variable maintenance. Variable aged trees throughout. Heavy buckthorn and garlic mustard, with reed canary grass present in openings along stream. Honeysuckle present but not common. Trees range from dry forest on slopes to lowland hardwood species (*Populus deltoides* and *Ulmus americana*) along stream, but floodplain areas too small to map.

Natural Polygon ID	29A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	3	Invasives	408-4, 411-3
Surveyor	AJR	Date	9/7/2006

Location	Scientific Name	Common Name	
Canopy	<i>Acer rubrum</i>	Red Maple	
	<i>Acer saccharum</i>	Sugar Maple	
	<i>Carya cordiformis</i>	Bitternut Hickory	
	<i>Fraxinus pennsylvanica</i>	Green Ash	
	<i>Populus deltoides</i>	Cottonwood	
	<i>Populus grandidentata</i>	Big Toothed Aspen	
	<i>Prunus serotina</i>	Black Cherry	
	<i>Prunus serotina</i>	Black Cherry	
	<i>Quercus alba</i>	White Oak	
	<i>Quercus macrocarpa</i>	Bur Oak	
	<i>Quercus rubra</i>	Red Oak	
	<i>Salix nigra</i>	Black Willow	
	<i>Tilia americana</i>	Basswood	
	<i>Ulmus americana</i>	American Elm	
<i>Ulmus rubra</i>	Red Elm		
Subcanopy cont.	<i>Acer saccharum</i>	Sugar Maple	
	<i>Amelanchier laevis</i>	Allegheny Serviceberry	
	<i>Betula papyrifera</i>	Paper Birch	
	<i>Fraxinus pennsylvanica</i>	Green Ash	
	<i>Ostrya virginiana</i>	Ironwood	
	<i>Populus tremuloides</i>	Quaking Aspen	
	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Rhamnus frangula</i>	Smooth Buckthorn	
	<i>Tilia americana</i>	Basswood	
	<i>Acer saccharum</i>	Sugar Maple	
Shrub	<i>Cornus racemosa</i>	Gray Dogwood	
		Common	
	<i>Prunus virginiana</i>	Chokecherry	
	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Rhus glabra</i>	Smooth Sumac	
	<i>Ribes cynosbati</i>	Prickley Gooseberry	
	Ground	<i>Actea alba</i>	White Baneberry
		<i>Actea rubra</i>	Red Baneberry
		<i>Alliaria petiolata</i>	Garlic Mustard
<i>Allium tricoccum</i>		Wild Leek	
<i>Amphicarpaea bracteata</i>		Hog-peanut	
<i>Arisaema triphyllum</i>		Jack in the Pulpit	
<i>Artemisia minor</i>		Common Burdock	

<i>Athyrium filix-femina</i>	Lady Fern
<i>Carex blanda</i>	Common Woodland Sedge
<i>Carex pennsylvanica</i>	Pennsylvania Sedge
<i>Carex rosea</i>	Rosey Sedge
<i>Carex stipata</i>	Common Fox Sedge
<i>Caulophyllum thalictroides</i>	Blue Cohosh
<i>Circaea luteana</i>	Enchanter's Nightshade
<i>Galium aparine</i>	Cleavers Three lobed bedstraw
<i>Galium trifidum</i>	Wild Geranium
<i>Geranium maculatum</i>	Common Oak Fern
<i>Gymnocarpium dryopteris</i>	Stickseed
<i>Hackelia virginiana</i>	Woodland Sunflower
<i>Helianthus strumosus</i>	Woodbine
<i>Parthenocissus inserta</i>	Common Buckthorn
<i>Rhamnus cathartica</i>	Canada Elderberry
<i>Sambucus canadensis</i>	Black Snakeroot
<i>Sanicula marilandica</i>	False Solomon's Seal
<i>Smilacina racemosa</i>	Early Meadow Rue
<i>Thalictrum dioicum</i>	Stinging Nettle
<i>Urtica dioica</i>	Large Flowered Bellwort
<i>Uvularia grandiflora</i>	Downy Yellow
<i>Viola pubescens</i>	Violet
<i>Viola sororia</i>	common Blue Violet

Notes: Highly variable Maple Basswood forest leaning from Oak dominance on high point to Lowland Hardwood species near wetland basins. Variability also due to land uses. Irregular shaped forest is surrounded by a combination of major roadways, wetlands, maintained open space and residential backyards. Portions of site contain large open grown Oaks (mostly Red Oak). Due to the irregular shape of the forest and multiple paved and unpaved trails, there is much edge, and limited interior forest. Most areas have diverse native ground layer vegetation. Buckthorn and Garlic Mustard are both common and in places dominant. Paved path appears to limit foot traffic in woods.

Natural Polygon ID	29B	MLCCS Code	61620
Community Description	Emergent Wetland	Quality Ranking	D
Field Check Level	4	Invasives	412-4
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Agrostis hyemalis</i>	Ticklegrass
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex vulpinoidea</i>	Fox Sedge
	<i>Impatiens</i> sp.	Jewelweed
	<i>Lemna minor</i>	Duckweed
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Sagittaria latifolia</i>	Arrowhead
	<i>Scirpus cyperinus</i>	Woolgrass
	<i>Scirpus fluviatilis</i>	River Bulrush
	<i>Thelypteris palustris</i>	Marsh Fern
<i>Typhya x glauca</i>	Hybrid Cattail	

Notes: Emergent wetland with central portion dominated almost exclusively by River Bulrush (60% of total wetland) and edge dominated by Reed Canary Grass

Natural Polygon ID	29C	MLCCS Code	61620
Community Description	Emergent Marsh	Quality Ranking	D
Field Check Level	4	Invasives	406-2, 412-4
Surveyor	AJR	Date	9/7/2006

Location	Scientific Name	Common Name
Ground	<i>Alyssa subcordatum</i>	Water Plantain
	<i>Bidens cernuus</i>	Nodding beggars-ticks
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Impatiens capensis</i>	Jewellweed
	<i>Lemna minor</i>	Lesser Duckweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Sagittaris latifolia</i>	Broad Leaved Arrowhead
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Poor quality emergent wetland along stream backwater. Dominated by arrowhead, most of opening is too wet for Reed Canary dominance. Flooded trees are scattered throughout. Backwater appears to be wetter than in past possibly due to trail/culvert that crosses stream.

Natural Polygon ID	29D	MLCCS Code	61640
Community Description	Wet Meadow - Semipermanently Flooded	Quality Ranking	C/D
Field Check Level	3	Invasives	402-2, 406-2
Surveyor	AJR	Date	

Location	Scientific Name	Common Name
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Impatiens capensis</i>	Jewellweed
	<i>Polygonum sagittatum</i>	Heart Leaved Tearthumb
	<i>Rumex crispus</i>	Curly Dock
	<i>Scirpus fluviatilis</i>	River Bulrush
	<i>Solanum dulcamara</i>	Bittersweet Nightshade
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Small wet meadow dominated by Lake Sedge and River Bulrush located between large forested remnant and backyards. The 1/2 of basin located near stormwater runoff stream is dominated by Reed Canary and Cattails. This area is located away from stormwater inputs.

Natural Polygon ID	30A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-3
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Tilia americana</i>	Basswood
Shrubs	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus typhina</i>	Staghorn Sumac
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Alliaria officinalis</i>	Garlic mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Woodland Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Erigeron philadelphicus</i>	Daisy Fleabane
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort
	<i>Vitis riparia</i>	Riverbank Grape

Notes: Nearly pure stand of Sugar Maple. Within core areas, sugar maple dominates all vertical layer. At edges, and along power corridor. Sugar maple, buckthorn and sumac form thick shrub edge. Ground later vegetation sparse under dense sugar maple.

Natural Polygon ID	30B	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-2
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus typhina</i>	Staghorn Sumac
	<i>Ribes cynosbati</i>	Prickley Gooseberry
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Alliaria officinalis</i>	Garlic mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Woodland Sedge
	<i>Carex rosea</i>	Rosy Sedge
		Pennsylvania
	<i>Cerex pennsylvanica</i>	Sedge
	<i>Erigeron philadelphicus</i>	Daisy Fleabane
	<i>Parthenocisus inserta</i>	Woodbine
	<i>Pilea lutea</i>	Clearweed
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort
	<i>Vitus riparia</i>	Riverbank Grape

Notes: Nearly pure stand of Sugar Maple. Within core areas, sugar maple dominates all vertical layers. At edges, and along power corridor. Sugar maple, buckthorn and sumac form thick shrub edge. Ground later vegetation sparse under dense sugar maple.

Natural Polygon ID	30C	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-2
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus typhina</i>	Staghorn Sumac
	<i>Ribes cynosbati</i>	Prickley Gooseberry
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Acer saccharum</i>	Sugar Maple
	<i>Alliaria officinalis</i>	Garlic mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Woodland Sedge
	<i>Carex rosea</i>	Rosy Sedge
		Pennsylvania
	<i>Cerex pennsylvanica</i>	Sedge
	<i>Erigeron philadelphicus</i>	Daisy Fleabane
	<i>Parthenocisus inserta</i>	Woodbine
	<i>Pilea lutea</i>	Clearweed
	<i>Sanguinaria canadensis</i>	Bloodroot
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort
	<i>Vitus riparia</i>	Riverbank Grape

Notes: Nearly pure stand of Sugar Maple. Within core areas, sugar maple dominates all vertical layers. At edges, and along power corridor. Sugar maple, buckthorn and sumac form thick shrub edge. Ground later vegetation sparse under dense sugar maple.

Natural Polygon ID	31A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5, 411-2
Surveyor	AJR	Date	6/20/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Betula papyrifera</i>	Paper Birch
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Ostrya virginiana</i>	Ironwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrubs	<i>Vitis riparia</i>	Riverbank Grape
	<i>Alliaria officinalis</i>	Garlic mustard
Ground	<i>Arisaema tryphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Wood Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Gymnocarpium dryopteris</i>	Common Oak Fern
	<i>Parthenocisus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Thalictrum daisycarpum</i>	Tall Meadow Rue
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort

Notes: Mixed, mature hardwood forest with thick buckthorn ground and shrub layers. Site has been surveyed and staked for development. Ground layer diversity limited by thick buckthorn dominance. Woods littered with rusted oil drums, fencing and other garbage.

Natural Polygon ID	31B	MLCCS Code	61620
Community Description	Mixed Emergent Marsh, Seasonally Flooded	Quality Ranking	D
Field Check Level	3	Invasives	412-2
Surveyor	AJR	Date	6/20/2006

Location	Scientific Name	Common Name
Ground	<i>Lemna minor</i>	Duckweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Scirpus fluviatilis</i>	River Bulrush

Notes: Very wet flooded basin where River Bulrush dominates flooded center. Nearly pure stand of River Bulrush with Duckweed in areas of open water. Reed Canary Grass pure at edges.

Natural Polygon ID	31C	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-2
Surveyor	AJR	Date	6/20/2006

Location	Scientific Name	Common Name
Canopy	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes</i> sp.	Gooseberry
	<i>Rubus</i> sp.	Raspberry
Ground	<i>Parthenocissus inserta</i>	Woodbine
	<i>Anemone thalictroides</i>	Rue anemone
	<i>Arisaema tryphyllum</i>	Jack in the Pulpit
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort

Notes: Mature, open grown closed oak canopy with mostly sparse ground cover. Buckthorn appears to have been both treated in place and removed.

Natural Polygon ID	31D	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C/D
Field Check Level	4	Invasives	411-2, 408-4
Surveyor	AJR	Date	6/20/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Betula papyrifera</i>	Paper Birch
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Vitis riparia</i>	Riverbank Grape
Shrub	<i>Berberis thunbergii</i>	Japanese barberry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Vaccinium</i> sp	Blueberry
	<i>Xanthoxylum americanum</i>	Prickly Ash
Ground	<i>Alliaria officinalis</i>	Garlic Mustard
	<i>Amphicaraea bracteata</i>	Hog-Peanut
	<i>Arisaema triphyllum</i>	Jack in the Pulpet
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex stipata</i>	Fox Sedge
	<i>Cicuta maculata</i>	Common Water Hemlock
	<i>Galium apparine</i>	Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Impatiens</i> sp.	Jewellweed
	<i>Maianthemum canadense</i>	Canada Mayflower
	<i>Parthenocisus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn

Notes: Poor quality maple forest with abundant buckthorn. Regrowth of Maple, Green Ash common in subcanopy. Ground layer impacts include areas of worm infestation (marginal duff), excessive foot traffic and buckthorn dominance.

Natural Polygon ID	31E	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-4, 411-4
Surveyor	AJR	Date	6/20/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Betula papyrifera</i>	Paper Birch
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Ulmus americana</i>	American Elm
Shrubs Ground	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Carex blanda</i>	Common Wood Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex lupulina</i>	Common Hop Sedge
	<i>Carex lurida</i>	Shallow Sedge
	<i>Carex oligosperma</i>	Few Seeded Hop Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex projecta</i>	Loose Headed Oval Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Carex scoparia</i>	Broom Sedge
		Common Fox Sedge
	<i>Carex stipata</i>	Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Galium aparine</i>	Cleavers
	<i>Juncus tenuis</i>	Path Rush
	<i>Polygonum sp.</i>	Smartweed
	<i>Rhamnus cathartica</i>	Common Buckthorn

Notes: Poor quality, low wet forest with few large trees and abundant buckthorn and garlic mustard. Lowest areas have less buckthorn and are dominated by a diverse mix of native sedge species and mud flat.

Natural Polygon ID	31F	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	A
Field Check Level	4	Invasives	412-2, 406-2, 402-2
Surveyor	AJR	Date	6/20/2006

Location	Scientific Name	Common Name
Shrub	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix pedicularis</i>	Bog Willow
	<i>Spiraea tomentosa</i>	Steeplebush
Ground	<i>Calamagrostis canadensis</i>	Canada Bluejoint
	<i>Carex lasiocarpa</i>	Wirgrass Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Eleocharis</i> sp.	A species of Spikerush
	<i>Gallium trifidum</i>	Northern Three Lobed Bedstraw
	<i>Glyceria grandis</i>	American Manna Grass
	<i>Glyceria striata</i>	Fowl Manna Grass
	<i>Impatiens</i> sp.	Jewelweed
	<i>Iris versicolor</i>	Blueflag Iris
	<i>Lemna minor</i>	Duckweed
	<i>Lycopus americana</i>	American Water Horehound
	<i>Lycopus americana</i>	Water Horehound
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Polygonum</i> sp.	Smartweed
	<i>Potentilla palustre</i>	Marsh Cinquefoil
<i>Sagittaria grandifolia</i>	Arrowhead	
<i>Sphagnum</i> sp.	Sphagnum Moss	
<i>Thelypteris palustris</i>	Marsh Fern	
<i>Typha x glauca</i>	Hybrid Cattail	

Notes: High quality floating mat wetland dominated by sedges and marsh fern on floating sphagnum. High diversity throughout with minimal invasive species present. Reed Canary Grass located only at dry/mineral soils on margins. Cattails and Purple Loosestrife sparse. Land located on private lands where land is currently under development. Retaining wooded buffers should be a priority for this site.

Natural Polygon ID	31G	MLCCS Code	61610
Community Description	Cattail Marsh	Quality Ranking	D
Field Check Level	3	Invasives	406-4, 412-2
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Salix lucida</i>	Shining Willow
	<i>Salix pedicularis</i>	Bog Willow
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex lasiocarpa</i>	Wire Grass Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Glyceria grandis</i>	Giant Reed Grass
	<i>Impatiens</i> sp.	Jewellweed
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Sagittaria latifolia</i>	Arrowhead
	<i>Thelyptis palustris</i>	Marsh Fern
<i>Typha x glauca</i>	Hybrid Cattail	

Notes: Cattail dominated wetland with diverse sedge meadow community persisting at margins

Natural Polygon ID	31H	MLCCS Code	61620
Community Description	Emergent Wetland	Quality Ranking	C
Field Check Level	3	Invasives	406-3, 412-2
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Alysm subcordatum</i>	Water Plantain
	<i>Cicuta maculata</i>	Water Hemlock
	<i>Gallium</i> sp.	Bedstraw
	<i>Glyceria grandis</i>	Giant Reed Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Potamogeton</i> sp.	Pondweed species
	<i>Sagittaria latifolia</i>	Arrowhead
	<i>Thelyptis palustris</i>	Marsh Fern
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Lake Sedge dominated wetland too wet for encroaching Reed Canary Grass at margins. Hybrid cattails common but not dominant.

Natural Polygon ID	311	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-5
Surveyor	AJR	Date	6/21/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Prunus serotina</i>	Black Cherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
Shrubs	<i>Lonicera tatarica</i>	Tatarian Honeysuckle
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Symphoricarpos alba</i>	Snowberry
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Wood Sedge
		Pennsylvania
	<i>Cerex pennsylvanica</i>	Sedge
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Thalictrum dioicum</i>	Early Meadow Rue

Notes: Mature Maple Basswood overstory heavily overgrown with buckthorn at all but canopy layer. Poor quality woodlands adjacent to regional trail on private lands.

Natural Polygon ID	32A	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	3	Invasives	408-2, 411-2
Surveyor	AJR	Date	5/16/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Betula papyrifera</i>	Paper Birch
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Ostrya virginiana</i>	Ironwood
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Shrubs	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex blanda</i>	Wood Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
		Pennsylvania
	<i>Cerex pennsylvanica</i>	Sedge
	<i>Gymnocarpium dryopteris</i>	Oak Wood Fern
	<i>Hesperis matronalis</i>	Dames Rocket
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Sambucus canadensis</i>	Elderberry
		False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod
<i>Thalictrum dioicum</i>	Early Meadow-rue	
<i>Thalictrum dioicum</i>	Early Meadow Rue	
<i>Uvularia grandiflora</i>	Large-flowered bellwort	
<i>Vitis riparia</i>	Riverbank Grape	

Notes: Mature Maple Basswood Forest with large lot houses and road built through center. Overstory mostly intact between houses. Sugar Maple dominated fragmented forest. Areas with dense shade have limited ground layer vegetation with understory/shrub layer dominated by Sugar Maple. More ground vegetation is present at home sites, near openings and along roadways.

Natural Polygon ID	32B	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-5, 412-2
Surveyor	AJR	Date	6/14/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Betula papyrifera</i>	Paper Birch
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Salix alba</i>	White Willow
	<i>Tilia americana</i>	Basswood
	Subcanopy	<i>Acer saccharum</i>
<i>Ostrya virginiana</i>		Ironwood
<i>Populus tremuloides</i>		Quaking Aspen
<i>Quercus rubra</i>		Red Oak
<i>Rhamnus cathartica</i>		Common Buckthorn
<i>Tilia americana</i>		Basswood
<i>Ulmus americana</i>		American Elm
Shrubs		<i>Cornus alternifolia</i>
	<i>Cornus racemosa</i>	Gray Dogwood
	<i>Cornus sericea</i>	Red Osier Dogwood
	<i>Corylus americana</i>	Hazelnut
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus glabra</i>	Smooth Sumac
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpet
	<i>Tilia americana</i>	Basswood
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Osmunda claytoniana</i>	Interrupted Fern
	<i>Impatiens capensis</i>	Jewellweed
	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Uvularia grandiflora</i>	Large-flowered bellwort
	<i>Ribes cynosbati</i>	Prickly Gooseberry
<i>Actea rubra</i>	Red Baneberry	

Natural Polygon ID	32B	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Vitis riparia</i>	Riverbank Grape
	<i>Carex rosea</i>	Rosy Sedge
	<i>Cerex pennsylvanica</i>	Pennsylvania Sedge
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Carex blanda</i>	Wood Sedge
	<i>Parthenocissus inserta</i>	Woodbine

Notes: Mature Maple Basswood Forest with large lot houses and road built through center. Overstory mostly intact between houses. Sugar Maple dominated fragmented forest. Areas with dense shade have limited ground layer vegetation with understory/shrub

Natural Polygon ID	32D	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	B
Field Check Level	4	Invasives	412-2, 406-3, 402-3
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Carex aquatilis</i>	Water Sedge
	<i>Carex comosa</i>	Bottlebrush Sedge
	<i>Carex crinita</i>	Fringed Sedge
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Eleocharis</i> sp.	A species of Spikerush
	<i>Impatiens</i> sp.	Jewelweed
	<i>Iris versicolor</i>	Blueflag Iris
	<i>Lemna minor</i>	Duckweed
	<i>Liparis loeselii</i>	Fen Orchid
	<i>Lycopus americana</i>	Water Horehound
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Polygonum</i> sp.	Smartweed
	<i>Pontederia cordata</i>	Pickerell Weed
	<i>Sagittaria grandifolia</i>	Arrowhead
	<i>Scirpus fluviatilis</i>	River Bulrush
<i>Scirpus validus</i>	Soft Stem Bulrush	
<i>Thelypteris palustris</i>	Marsh Fern	
<i>Typhya x glauca</i>	Hybrid Cattail	
<i>Urtica dioica</i>	Stinging Nettle	

Notes: Very diverse wetland edge along woodland edge and Loose Line Trail Berm. Non-native invasive species common, but not dominant. Floating mat on sphagnum.

Natural Polygon ID	32E	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-3, 411-2
Surveyor	AJR	Date	6/14/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Ostrya virginiana</i>	Ironwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm
Shrubs	<i>Acer saccharum</i>	Sugar Maple
	<i>Cornus racemosa</i>	Gray Dogwood
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus virginiana</i>	Choke Cherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
	<i>Viburnum rafinequianum</i>	Arrow-wood
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Actea rubra</i>	Red Baneberry
	<i>Allium tricoccum</i>	Wild Leek
Ground	<i>Athyrium filix-femina</i>	Lady Fern
	<i>Carex blanda</i>	Wood Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
	<i>Cerex pennsylvanica</i>	Pennsylvania Sedge
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Impatiens capensis</i>	Jewellweed
	<i>Iris pseudacorus</i>	Yellow Iris
	<i>Matteuchia struthiopteris</i>	Ostrich Fern
	<i>Menospermum canadensis</i>	Canada Moonseed
	<i>Osmunda claytoniana</i>	Interrupted Fern
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Quercus rubra</i>	Red Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn

Natural Polygon ID	32E	MLCCS Code	32150
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Location	Scientific Name	Common Name
Ground cont.	<i>Sambucus canadensis</i>	Elderberry
	<i>Sanguinaria canadensis</i>	Bloodroot False Solomon's
	<i>Smilacina racemosa</i>	Seal
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Tilia americana</i>	Basswood
	<i>Uvularia grandiflora</i>	Large-flowered bellwort Downy Yellow
	<i>Viola pubescens</i>	Violet
	<i>Vitis riparia</i>	Riverbank Grape

Notes: Mesic Oak forest with Basswood dominating lower elevations near lake and Red Oak dominating upper elevations. Ground layer with limited diversity, with many compacted foot paths, erosion, bar soil and garbage from adjacent backyard areas. Duff layer very sparse in most areas.

Natural Polygon ID	32F	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C
Field Check Level	4	Invasives	408-5
Surveyor	AJR	Date	6/14/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Amelanchier laevis</i>	Allegheny Serviceberry
	<i>Ulmus americana</i>	American Elm
	<i>Tilia americana</i>	Basswood
	<i>Prunus serotina</i>	Black Cherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ostrya virginiana</i>	Ironwood
	<i>Cornus alternifolia</i>	Pagoda Dogwood
	<i>Acer sacharum</i>	Sugar Maple
Shrubs	<i>Cornus alternifolia</i>	Pagoda Dogwood
	<i>Corylus americana</i>	Hazelnut
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Aralia nudicaulis</i>	Wild sarsparilla
	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Aster</i> sp.	An Aster
	<i>Carex blanda</i>	Wood Sedge Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Caulophyllum thalictroides</i>	Blue Cohosh
	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Crataegus</i> sp.	Hawthorn species
	<i>Gallium aparine</i>	Cleavers
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Glyceria</i> sp.	Manna Grass
	<i>Menospermum canadensis</i>	Canada Moonseed
	<i>Parthenocissus inserta</i>	Woodbine
<i>Phalaris arundinacea</i>	Reed Canary Grass	

Natural Polygon ID	32F	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Quercus rubra</i>	Red Oak
	<i>Ranunculus abortivus</i>	Small Flowered Crowfoot
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus radicans</i>	Poison Ivy
	<i>Rosa blanda</i>	Smooth Rose
	<i>Sambucus canadensis</i>	Elderberry
	<i>Sanguinaria canadensis</i>	Bloodroot
		False Solomon's Seal
	<i>Smilacina racemosa</i>	Seal
	<i>Smilax tamnoides</i>	Bristley Greenbriar
	<i>Solidago flexicaulis</i>	Zigzag Goldenrod
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Tilia americana</i>	Basswood
	<i>Trillium cernuum</i>	Nodding Trillium
	<i>Typha x glauca</i>	Hybrid Cattail
	<i>Uvularia grandiflora</i>	Large-flowered bellwort
	Downy Yellow	
<i>Viola pubescens</i>	Violet	
<i>Zizia aruea</i>	Golden Alexander's	

Notes: Mesic Oak forest located on peninsula of lake. Oak dominated overstory with elm and ash close to shore. Buckthorn abundant, though clearing is underway. No oaks present beneath overstory. Heavy Pagoda Dogwood in understory. Overstory oaks open grown with large, but closed, continuous canopy.

Natural Polygon ID	33A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ulmus americana</i>	American Elm
Shrub	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ribes cynosbati</i>	Prickly Gooseberry
Ground	<i>Allium tricoccum</i>	Wild Leek
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Dryopteris intermedia</i>	Fancy Wood Fern
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hesperis matronalis</i>	Dame's Rocket
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Quercus rubra</i>	Red Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Smilicina racemosa</i>	False Solomon's Seal
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	Large Flowered	
	<i>Uvularia grandiflora</i>	Bellwort

Notes: Tall, mature, forest grown oak dominated canopy. Mostly White Oak in the canopy transitioning to sugar maple forest with sugar maple dominating understory.

Natural Polygon ID	33B	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	D
Field Check Level	4	Invasives	412-3, 406-3
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Carex scoparia</i>	Broom Sedge
	<i>Alisma subcordatum</i>	Water Plantain
	<i>Carex lacustris</i>	Lake Sedge
		Common Hop
	<i>Carex lupulina</i>	Sedge
	<i>Carex stipata</i>	Fox Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex Vulpinoidea</i>	Brown Fox Sedge
	<i>Cicuta bulbosa</i>	Water hemlock
	<i>Equisetum fluviatile</i>	Water Horsetail
	<i>Glyceria grandis</i>	Reed Manna Grass
	<i>Impatiens</i> sp.	Jewelweed
	<i>Iris versicolor</i>	Blueflag Iris
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Poa palustris</i>	Marsh Bluegrass
<i>Ranunculus gmelinii</i>	Gmelin's Buttercup	
<i>Sagittaria grandifolia</i>	Arrowhead	
<i>Theliptris palustris</i>	Marsh Fern	
<i>Typhya x glauca</i>	Hybrid Cattail	

Notes: Diverse sedge meadow edge along wooded fringe of Hybrid Cattail Dominated Wetland. Appears to be protected by wooded edge providing shade that limits expansion of reed canary and cattail, and adjacency to Loose Line Trail.

Natural Polygon ID	33C	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-6
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpet
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Dryopteris intermedia</i>	Fancy Wood Fern
	<i>Galium aparine</i>	Cleavers
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hesperis matronalis</i>	Dame's Rocket
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Quercus rubra</i>	Red Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Uvularia grandiflora</i>	Bellwort

Notes: Mature oak forest with extremely heavy buckthorn. Very large forest grown oaks common. Very large ostrya dominate understory. Oak regeneration limited.

Natural Polygon ID	33D	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	412-2
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Red Elm</i>	Ulmus rubra
	<i>Ulmus americana</i>	American Elm
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex lupulina</i>	Common Hop Sedge
	<i>Glyceria striata</i>	Fowl Manna Grass
	<i>Lemna Minor</i>	Duck Weed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Ranunculus arbortivus</i>	Small Flowered Buttercup
	<i>Solanum dulcamara</i>	Bittersweet Nightshade

Notes: Wooded wetland surrounded by oak forest with flooded center. New road has been constructed along southern edge of wetland. Mostly mudflat with bare soils present during June field survey.

Natural Polygon ID	33E	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	4	Invasives	408-6, 411-3
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Subcanopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Carex pennsylvanica</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosey Sedge
	<i>Dryopteris intermedia</i>	Fancy Wood Fern
	<i>Galium aparine</i>	Cleavers
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Hesperis matronalis</i>	Dame's Rocket
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Quercus rubra</i>	Red Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Uvularia grandiflora</i>	Large Flowered Bellwort

Notes: Mature oak forest with extremely heavy buckthorn. Very large forest grown oaks common. Very large ostrya dominate understory. Oak regeneration limited.

Natural Polygon ID	34A	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C/D
Field Check Level	3	Invasives	408-4
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name	
Canopy	<i>Populus deltoides</i>	Cottonwood	
	<i>Populus tremuloides</i>	Quaking Aspen	
	<i>Quercus alba</i>	White Oak	
	<i>Quercus macrocarpa</i>	Bur Oak	
	<i>Quercus rubra</i>	Red Oak	
	<i>Ulmus americana</i>	American Elm	
Subcanopy	<i>Ostrya virginiana</i>	Ironwood	
	<i>Quercus rubra</i>	Red Oak	
Shrub	<i>Amelanchier laevis</i>	Allegheny Serviceberry	
	<i>Cornus serotina</i>	Red Osier Dogwood	
	<i>Lonicera tatarica</i>	Tatarian Honeysuckle'	
	<i>Prunus virginiana</i>	Common Chokecherry	
	<i>Quercus rubra</i>	Red Oak	
	<i>Rhamnus cathartica</i>	Common Buckthorn	
	<i>Rhus glabra</i>	Smooth Sumac	
	<i>Ribes cynosbati</i>	Prickly Gooseberry	
	Ground	<i>Arctium minor</i>	Common Burdock
		<i>Arisaema triphyllum</i>	Jack in the Pulpit
<i>Aster cordifolius</i>		Heart Leaved Aster	
<i>Aster macrophyllum</i>		Big Leaved Aster	
<i>Carex Pennsylvanica</i>		Pennsylvania Sedge	
<i>Carex rosea</i>		Rosy Sedge	
<i>Galium aparine</i>		Cleavers	
<i>Galium lanceolatum</i>		Wild Licorice	
<i>Melilotus officinalis</i>		Yellow Sweet Clover	
<i>Poa pratensis</i>		Kentucky Bluegrass	
<i>Rhamnus cathartica</i>		Common Buckthorn	
<i>Rhus radicans</i>		Poison Ivy	

Natural Polygon ID	34A	MLCCS Code	32112
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Location	Scientific Name	Common Name
Ground cont.	<i>Smilacina racemosa</i>	False Solomon's Seal
	<i>Solidago canadensis</i>	Canada Goldenrod
	<i>Trifolium repens</i>	White Clover
	<i>Uvularia grandiflora</i>	Large flowered bellwort

Notes: White and Red Oak dominated woods on steep slopes between lake shore and residential back yards. Heavy buckthorn in understory, particularly near openings. Ground layer vegetation dominated by adventitious native and non-native species.

Natural Polygon ID	34B	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	A/B
Field Check Level	4	Invasives	412-2, 406-2, PL-2
Surveyor	AJR	Date	6/6/2006

Location	Scientific Name	Common Name
Shrub	<i>Acer rubra</i>	Red Maple
	<i>Betula papyrifera</i>	Paper Birch
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Salix pedicellaris</i>	Bog Willow
	<i>Salix</i> sp.	A Willow Species
	<i>Spiraea tomentosa</i>	Steeplebush
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Carex interior</i>	Inland Sedge
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex lasiocarpa</i>	Narrow Leaved Woolly Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Eleocharis</i> sp.	A species of Spikerush
	<i>Eupatorium maculatum</i>	Spotted Joe-Pye Weed

Natural Polygon ID	34B	MLCCS Code	61641
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Location	Scientific Name	Common Name
Ground cont.	<i>Glyceria grandis</i>	Reed Manna Grass
	<i>Impatiens sp.</i>	Jewelweed
	<i>Iris versicolor</i>	Blue Flag Iris
	<i>Lysimachia terrestris</i>	Swamp Candles
	<i>Lysimachia thrysiflora</i>	Swamp Loosestrife
	<i>Lythrum salicaria</i>	Purple Loosestrife
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum sp.</i>	Smartweed
	<i>Pontederia cordata</i>	Pickerell Weed
	<i>Potentilla palustris</i>	Marsh Cinquefoil
	<i>Rhamnus frangula</i>	Glossy Buckthorn
	<i>Rumex crispus</i>	Curly Dock
	<i>Sagittaria latifolia</i>	Broadleaved Arrowhead
	<i>Scirpus validus</i>	Soft Stem Bulrush
	<i>Solanum dulcamara</i>	Bittersweet Nightshade
	<i>Sphagnum sp.</i>	Sphagnum Moss
<i>Thelypteris palustris</i>	Marsh Fern	
<i>Typhya x glauca</i>	Hybrid Cattail	
<i>Urtica dioica</i>	Stinging Nettle	

Notes: Very high quality floating sedge mat with high diversity of forbs, shrubs and grasslike plants. Some hybrid cattails and are present. Edge dominated by reed canary grass, but very uncommon on floating mat. Trees species stunted throughout, mixed with floating shrub component

Natural Polygon ID	34C	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-4
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Morus alba</i>	Russian Mulberry
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus rubra</i>	Red Oak
	<i>Ulmus americana</i>	American Elm
	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrub	<i>Xanthoxylum americana</i>	Prickley Ash
Ground	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Artemisia minor</i>	Common Burdock
	<i>Athyrium filix-foemina</i>	Lady Fern
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Uvularia grandiflora</i>	Large flowered bellwort

Notes: White/Red Oak Forest with mature oak overstory. Sugar maple dominant in understory. Fragmented by homes and lawns with heavy buckthorn in places. Provides very nice buffer to very high quality sedge meadow.

Natural Polygon ID	34D	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	C
Field Check Level	3	Invasives	408-3, 411-2
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer Sacharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Populus deltoides</i>	Cottonwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus alba</i>	White Oak
	<i>Quercus rubra</i>	Red Oak
Subcanopy	<i>Acer negundo</i>	Boxelder
	<i>Acer saccharum</i>	Sugar Maple
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Prunus serotina</i>	Black Cherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
Shrub	<i>Ulmus americana</i>	American Elm
	<i>Acer negundo</i>	Boxelder
	<i>Prunus virginiana</i>	Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sambucus canadensis</i>	Elderberry
	<i>Viburnum trilobum</i>	Highbush Cranberry
Ground	<i>Xanthoxylum americana</i>	Prickley Ash
	<i>Actaea rubra</i>	Red Baneberry
	<i>Adiantum pedatum</i>	Maidenhair Fern
	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Dryopteris intermedia</i>	Fancy Wood Fern
	<i>Galium apararine</i>	Cleavers
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Gymnocarpium dryopteris</i>	Wood Fern
	<i>Osmunda clatoniana</i>	Interrupted Fern
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Prunus virginiana</i>	Chokecherry
	<i>Ranunculus sp.</i>	Crowfoot
<i>Rhamnus cathartica</i>	Common Buckthorn	

Natural Polygon ID	34D	MLCCS Code	32150
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Location	Scientific Name	Common Name
Ground cont.	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Uvularia grandiflora</i>	Large flowered bellwort
	<i>Viburnum trilobum</i>	Highbush Cranberry
	<i>Viola pubescens</i>	Yellow Downy Violet

Notes: Hardwood forest with mature Sugar Maple/Oak dominated canopy. Good species diversity at all strata. Buckthorn common but not dominant. Land in private ownership, and landuse/groundcover maintenance variable.

Natural Polygon ID	34E	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	D
Field Check Level	3	Invasives	408-6
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Ulmus americana</i>	American Elm
Canopy	<i>Quercus rubra</i>	Red Oak
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Ulmus americana</i>	American Elm
Shrub	<i>Acer negundo</i>	Boxelder
	<i>Rhamnus cathartica</i>	Common Buckthorn
Ground	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Artemisia minor</i>	Common Burdock
	<i>Parthenocissus inserta</i>	Woodbine

Notes: Highly degraded Oak dominated forest. Nearly complete domination of all strata except canopy by Common Buckthorn. Overstory dominated by open grown mature White Oak.

Natural Polygon ID	35A	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	D
Field Check Level	4	Invasives	412-3, 406-1
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Acorus calamus</i>	Sweet Flag
	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Eleocharis</i> sp.	A species of Spikerush
	<i>Impatiens</i> sp.	Jewelweed
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Polygonum</i> sp.	Smartweed
	<i>Scirpus fluviatilis</i>	River Bulrush
	<i>Scirpus validus</i>	Soft Stem Bulrush
	<i>Thelypteris palustris</i>	Marsh Fern
	<i>Typhya x glauca</i>	Hybrid Cattail
<i>Urtica dioica</i>	Stinging Nettle	

Notes: Wet Sedge Meadow with Reed Canary Grass and Hybrid Cattail at margins.

Natural Polygon ID	35B	MLCCS Code	61320
Community Description	Wet Meadow, Temporarily Flooded	Quality Ranking	D
Field Check Level	4	Invasives	412-4
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Carex stipata</i>	Yellow Fox Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Carex vulpinoidea</i>	Brown Fox Sedge
	<i>Cicuta maculata</i>	Common Water Hemlock
	<i>Cornus sericea</i>	Red Osier Dogwood
	<i>Eleocharis</i> sp.	A species of Spikerush
	<i>Impatiens</i> sp.	Jewelweed
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Poa pratensis</i>	Kentucky Bluegrass
	<i>Polygonum amphibium</i>	Water Smartweed
	<i>Populus deltoides</i>	Cottonwood
	<i>Potentilla norvegica</i>	Rough Cinquefoil
	<i>Solidago canadensis</i>	Canada goldenrod
<i>Thelypteris palustris</i>	Marsh Fern	
<i>Typha x glauca</i>	Hybrid Cattail	
<i>Urtica dioica</i>	Stinging Nettle	

Notes: Sedge Meadow within heavy Reed Canary Grass and Kentucky Bluegrass components. Isolated by Roads and mowed turf in park setting.

Natural Polygon ID	35C	MLCCS Code	32112
Community Description	Oak Forest, Mesic Subtype	Quality Ranking	C/D
Field Check Level	3	Invasives	408-3, 411-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus alba</i>	White Oak
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Salix nigra</i>	Black Willow
	<i>Tilia americana</i>	Basswood
	<i>Ulmus americana</i>	American Elm

Natural Polygon ID	35C	MLCCS Code	32112
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Location	Scientific Name	Common Name
Subcanopy cont.	<i>Ostrya virginiana</i>	Ironwood
	<i>Quercus rubra</i>	Red Oak
	<i>Tilia americana</i>	Basswood
Shrub	<i>Lonicera tatarica</i>	Tatarian Honeysuckle
	<i>Prunus virginiana</i>	Common Chokecherry
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rubus</i> sp.	Raspberry
	<i>Uvularia grandiflora</i>	Large flowered bellwort
Ground	<i>Arisaema triphyllum</i>	Jack in the Pulpit
	<i>Atherium felix foemina</i>	Lady Fern
	<i>Carex Blanda</i>	Common Wood Sedge
	<i>Carex Pennsylvania</i>	Pennsylvania Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Fragaria</i> sp.	Wild Strawberry
	<i>Galium</i> sp.	Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Maianthemum canadense</i>	Wild Lily-of-the- Valley
	<i>Ranunculus</i> sp.	Crowfoot Species
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Theliptris palustris</i>	Marsh Fern
	<i>Tilia americana</i>	Basswood

Notes: Mature oak dominated Big Woods Forest on steep ridges between developed residential streets. Variable land management techniques by homeowners. Understory is very diverse with both native and weed species. Canopy dominated by oaks and basswoods on the upper slopes with elm, cottonwood and willow in low areas. Erosion and gulying is common where homes are built on and above steep slopes.

Natural Polygon ID	35D	MLCCS Code	61420
Community Description	Wet Meadow	Quality Ranking	D
Field Check Level	4	Invasives	412-2, 406-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Typhya x glauca</i>	Hybrid Cattail

Notes: Lake Sedge Dominated Wetland at the margins of a larger Hybrid Cattail dominated basin. Significant siltation dominates southern edge at edge of woods.

Natural Polygon ID	35E	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	C
Field Check Level	4	Invasives	412-2, 406-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Shrubs	<i>Asclepias incarnata</i>	Swamp Milkweed
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Impatiens</i> sp.	Jewelweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Typhya x glauca</i>	Hybrid Cattail

Notes: Lake Sedge Dominated, Isolated wetland surrounded by woods. Low middle dominated by cattails. Edge along driveway dominated by Reed Canary Grass.

Natural Polygon ID	35F	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	B
Field Check Level	4	Invasives	
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer rubra</i>	Red Maple
Shrubs	<i>Cornus serotina</i>	Red Osier Dogwood
	<i>Rubus</i> sp.	Raspberry species
	<i>Sambucus canadensis</i>	Elderberry
Ground	<i>Asclepias incarnata</i>	Swamp Milkweed
	<i>Carex blanda</i>	Common Woodland Sedge
	<i>Carex gracillima</i>	Graceful Sedge
	<i>Carex intumescens</i>	Greater Bladder Sedge
	<i>Carex lacustris</i>	Lake Sedge
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Impatiens</i> sp.	Jewelweed
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass
<i>Solanum dulcamara</i>	Bittersweet Nightshade	
<i>Thelyptis palustris</i>	Marsh Fern	
<i>Typhya x glauca</i>	Hybrid Cattail	

Notes: Lake Sedge Dominated, Isolated wetland surrounded by woods.

Natural Polygon ID	35G	MLCCS Code	52530
Community Description	Bog Birch, Spirea Swamp - Semipermanently Flooded	Quality Ranking	B
Field Check Level	3	Invasives	406-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Shrubs	<i>Betula pumila</i>	Bog Birch
	<i>Salix exigua</i>	Sandbar Willow
	<i>Salix pedicularis</i>	Bog Willow
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Equisetum</i> sp.	Horsetail
	<i>Lemna</i> sp.	Duckweed
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Typhya x glauca</i>	Hybrid Cattail

Notes: Floating willow swamp dominated by bog species. Bog Willow and Bog Birch dominate shrub layer with sedges dominating herbaceous layer.

Natural Polygon ID	35H	MLCCS Code	61540
Community Description	Wet Meadow - Seasonally Flooded	Quality Ranking	C
Field Check Level	3	Invasives	406-2, 412 - 3, 417-2
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Equisetum</i> sp.	Horsetail
	<i>Lemna</i> sp.	Duckweed
	<i>Phalaris arundinacea</i>	Reed Canary Grass
	<i>Phragmites australis</i>	Giant Reed Grass
	<i>Typhya x glauca</i>	Hybrid Cattail

Notes: Sedge Dominated wetland with large invasive component mixed in.

Natural Polygon ID	35I	MLCCS Code	32220
Community Description	Lowland Hardwood Forest	Quality Ranking	D
Field Check Level	4	Invasives	411-4, 408-3
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer negundo</i>	Boxelder
	<i>Populus deltoides</i>	Cottonwood
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Quercus macrocarpa</i>	Bur Oak
Shrub	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Alliaria petiolata</i>	Garlic Mustard
	<i>Geranium maculatum</i>	Wild Geranium
Ground		

Notes: Poor quality wet woods near roadway. Limited groundlayer diversity. Flodded. Abundant Garlic Mustard.

Natural Polygon ID	35J	MLCCS Code	61540
Community Description	Sedge Meadow	Quality Ranking	D
Field Check Level	4	Invasives	412-2, 408-3
Surveyor	AJR	Date	5/17/2006

Location	Scientific Name	Common Name
Ground	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Salix exigua</i>	Sandbar Willow
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex stricta</i>	Tussock Sedge
	<i>Onoclea sensibilis</i>	Sensitive Fern
	<i>Phalaris arundinacea</i>	Reed Canary Grass

Notes: Poor quality sedge meadow surrounded by stormwater ponds and Cattail Wetlands.

Natural Polygon ID	35K	MLCCS Code	61641
Community Description	Wet Meadow, Floating Mat Subtype	Quality Ranking	C
Field Check Level	2	Invasives	406-2
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Shrub	<i>Acer negundo</i>	Boxelder
	<i>Salix</i> sp.	Willow Species
	<i>Spiraea alba</i>	Meadowsweet
Ground	<i>Carex lacustris</i>	Lake Sedge
	<i>Carex utriculata</i>	Yellow Lake Sedge
	<i>Sagittaria latifolia</i>	Broadleaved Arrowhead
	<i>Typha x glauca</i>	Hybrid Cattail

Notes: Floating center island isolated from Reed Canary Grass at edge of open water. Sedge dominated with few shrubs. Site viewed from shore, limited survey access.

Natural Polygon ID	35L	MLCCS Code	32150
Community Description	Maple Basswood Forest	Quality Ranking	D
Field Check Level	4	Invasives	408-5
Surveyor	AJR	Date	6/7/2006

Location	Scientific Name	Common Name
Canopy	<i>Acer saccharum</i>	Sugar Maple
	<i>Populus deltoides</i>	Cottonwood
	<i>Quercus macrocarpa</i>	Bur Oak
	<i>Quercus rubra</i>	Red Oak
	<i>Salix nigra</i>	Black Willow
	<i>Tilia americana</i>	Basswood
	<i>Quercus alba</i>	White Oak
	<i>Populus tremuloides</i>	Quaking Aspen
	<i>Prunus serotina</i>	Black Cherry
	<i>Ulmus americana</i>	American Elm
Subcanopy	<i>Ulmus rubra</i>	Red Elm
	<i>Acer negundo</i>	Boxelder
	<i>Fraxinus pennsylvanica</i>	Green Ash
	<i>Ostrya virginiana</i>	Ironwood
	<i>Quercus alba</i>	White Oak
	<i>Rhus typhina</i>	Smooth Sumac
Shrub	<i>Tilia americana</i>	Basswood
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Sambucus canadensis</i>	Elderberry
	<i>Vitis riparia</i>	Riverbank Grape Common
	<i>Prunus virginiana</i>	Chokecherry
Ground	<i>Xanthoxylum americana</i>	Prickley Ash
	<i>Uvularia grandiflora</i>	Large flowered bellwort
	<i>Aralia nudicaulis</i>	Wild Sarsparilla
	<i>Arisaema triphyllum</i>	Jack in the Pulpet
	<i>Aster macrophyllus</i>	Large Leaved Aster
	<i>Atherium felix femina</i>	Lady Fern
		Pennsylvania
	<i>Carex pennsylvanica</i>	Sedge
	<i>Carex rosea</i>	Rosy Sedge
	<i>Cornus alternifolia</i>	Pagoda Dogwood
<i>Diervilla lonicera</i>	Bush Honeysuckle	

Natural Polygon ID	35L	MLCCS Code	32150
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Location	Scientific Name	Common Name
Ground cont.	<i>Euphorbia esula</i>	Leafy Spurge
	<i>Galium</i> sp.	Bedstraw
	<i>Geranium maculatum</i>	Wild Geranium
	<i>Impatiens</i> sp.	Jewellweed
		Tatarian
	<i>Lonicera tatarica</i>	Honeysuckle
	<i>Parthenocissus inserta</i>	Woodbine
	<i>Rhamnus cathartica</i>	Common Buckthorn
	<i>Rhus radicans</i>	Poison Ivy
	<i>Thalictrum dioicum</i>	Early Meadow Rue
	<i>Theliptris palustris</i>	Marsh Fern
	Basswood	

Notes: Maple Basswood Forest with many mature trees on steep slopes. Understory dominated by Buckthorn. Cottonwoods common on lowest portions of site near lakeshore. Subcanopy a mix of basswood, Ash and Elms. Alpen clone dominates previously cutover areas.

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 phenological 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 and Jansen).

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, Sparganiaceae, 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 (Brome grass, 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)

Sempermanently 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).

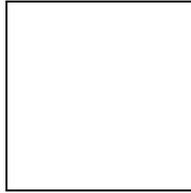
USNVC - U.S. National Vegetation Classification System for natural community identification developed by The Nature Conservancy and used by some federal agencies. The acronym NVCS is more commonly used.

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)

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:

Bart Richardson
Minnesota Department of Natural Resources
1200 Warner Rd.
St. Paul, MN 55106
Phone: 651-772-6150
email: bart.richardson@dnr.state.mn

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 of 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
<i>numerical code</i>	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	Deciduous	Mixed Con./Dec.	Mixed shrubs	Shrubs w/trees	Grasses w/trees	Grasses	Gardens	Buildings / Pavement	Exposed earth			
level 4	% impervious	% impervious	% impervious	% impervious	% impervious	% impervious	% impervious	% impervious	% impervious	% impervious			
level 5	Genus or community types (Alliance)					Genus grass	short long grass	prairie	vegetable	flowers	pavement	buildings	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 been 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 code in 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 been 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 code in 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.pdf/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.pdf/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 modifiers 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 details.

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	5 digit number

		invasive species or natural quality modifiers are used.	
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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 yyyyymmdd 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 - <i>Artemisia absinthium</i>	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
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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.pdf/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 with 11-25% impervious cover	1.ss.CE.i25.cOW.
12222	Other coniferous and/or deciduous shrubs and trees with 11-25% 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	Moderate 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 / Metamorphic 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

