



Soils of Pheasant Branch Conservancy

An Analysis of Soil Features and
Their Suitability for Recreational Uses
Using the U.S.D.A.'s Web Soil Survey

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September 2008



Abstract

The composition, form, and structure of soil help determine the uses that can be supported by a given area. One of the main tools available to help land users determine the potentials and limitations of soils on a property of interest is a soil survey. These reports describe in detail the properties of each kind of soil present and depict their locations on a map. Soil surveys are now available via the Internet through the NRCS Web Soil Survey. We used this tool to generate an objective analysis of soil suitability and limitations for recreational developments within Middleton's Pheasant Branch Conservancy. More than half the soils in the conservancy are under water or near saturation during much of the year. Other major soil groups in the area are high in silt content. As a result, the Web Soil Survey suitability analyses show that much of the conservancy is somewhat or very limited for many recreational uses. These findings underscore the logic of maintaining the conservancy area in a primarily undeveloped state, especially for the flood prevention and control functions the predominant soil types provide.

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Soils of Pheasant Branch Conservancy: An Analysis of Soil Features and Their Suitability for Recreational Uses

1.0. Introduction

1.1. The Importance of Soils Data

Many people assume that soils, with their naturally occurring mixture of mineral and organic ingredients, are all more or less alike. The exact composition, form, and structure of soil, however, changes from one location to another. In fact, great differences in soil properties can occur even within short distances (Ashman and Puri 2002; Buol et al. 1997; Soil Survey Staff 1993).

Soils can be porous and well drained or they may be seasonally wet or saturated and subject to flooding. They may be shallow to bedrock and too unstable to be used as a foundation for buildings or roads. High water tables make some soils poorly suited to basements or underground installations. Understanding the soil characteristics of a particular site can inform many decisions related to its use and management (Dent and Young 1981). For example, knowing soil properties can help homebuyers or developers determine soil-related hazards or limitations that could affect the development or alterations of future homesites. Farmers can use soils data to estimate the potential crop or forage production of their lands. Sanitary inspectors can use soils data to determine the suitability of areas for onsite sewage disposal systems. Engineers and planners can determine the suitability and limitations of soils for pipelines, buildings, landfills, recreation areas, and many other uses. Considering the soil properties and limitations of an area can help one avoid unnecessary complications, including extensive structural repairs caused by adverse soil properties at a site. In some cases, special foundations, walls, or other accommodations can be planned if soil hazards indicate that standard engineering designs would likely fail (ASTM 1993).

1.2. Web Soil Survey

One of the main tools available to help land users determine the potentials and limitations of soils is a soil survey. Available from the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), soil surveys describe in detail the properties of soils in the county or areas surveyed and show the location of each kind of soil on detailed maps (Soil Survey Staff 1993, 2001).

NRCS's online Web Soil Survey provides a single authoritative source for these soil data and related information. This Internet web site provides access to soil maps and data for more than 95 percent of the nation's counties, with an ultimate goal of having 100 percent coverage available via the web. The Soil Survey provides information on soil limitations for various planting, building construction, and other projects. Web Soil Survey can be accessed online at <http://websoilsurvey.nrcs.usda.gov/app/>.

1.3. Soils and Recreational Uses

It cannot be assumed that all land can support recreational uses. Some soils are as unsuitable for recreational uses as they are for supporting buildings or for growing crops. For example, the following soil properties can affect recreational uses:

- High water tables impose severe limitations on the use of soils for access roads, trails, ball fields, playgrounds, and picnic areas.
- Droughtiness makes it difficult to grow plants needed to prevent erosion, and droughty soils may require irrigation to maintain vegetation.
- Some clayey soils swell when wet and shrink when dry. Such soils tend to hold water for long periods of time and may fail to support trails, roads, and other structures unless special design features are used.
- Steep slopes can limit the use of soils for playgrounds, roads, and trails, but may be appropriate for some hiking areas, if certain design features are incorporated.
- If bedrock is at a shallow depth, it is difficult to level soils for playgrounds, to construct roads and trails, and to establish vegetation. Shallow soils are poorly suited for uses that require extensive grading.
- A clayey or sandy surface layer makes some soils undesirable for playgrounds or other uses that require heavy foot traffic.
- Soils that have a high clay content are sticky when wet and remain wet for long periods after rains. Loose, sandy soils are unstable and dusty when dry. Soils that have a texture of sandy loam or loam are the most suitable for recreational uses that require heavy foot traffic.
- Stones, gravel, and rocks impose moderate to severe limitations on the use of soils for playgrounds, trails, and other uses that require heavy foot traffic.

For the manager of a recreational area, a soil survey can provide information necessary for planning a conservation program to protect the area against erosion and other kinds of site damage. A soil survey can also provide guidance for selecting a use for each area, based on the suitability of the soil. For example, soils that are susceptible to erosion can be planted to trees, shrubs, and grasses and used in a nonintensive way, such as for nature study. Loamy, well-drained soils can be used for play areas and other uses that require heavy foot traffic.

1.4. The Study Site: Pheasant Branch Conservancy

Pheasant Branch Conservancy, a regionally significant natural area, is located on the northwest side of Lake Mendota in central Dane County. Pheasant Branch Creek, a Lake Mendota tributary, meanders through the conservancy, which contains a marsh with open water, natural springs and seeps, prairies, old fields, lowland forests, and wooded hills. These habitats support a wide variety of plants and animals, including rare, threatened, and endangered species. Although surrounded on three sides by urban development, this easily accessible 500+ acre conservancy provides a quiet refuge for bird-watchers, hikers, and other nature enthusiasts.

The Dane County Parks Department owns the northern portion of the conservancy. The city of Middleton's Public Lands Department owns the southern portion, including a corridor that extends along Pheasant Branch Creek's South Branch. The city and county cooperatively manage the conservancy as a single ecological and recreational unit. Maps in Section 3 of this report depict the conservancy boundaries.

Pheasant Branch Creek originates out of a glacial moraine in the Towns of Middleton and Springfield, and flows through the City of Middleton before entering Lake Mendota. The seven-mile long creek has four distinct parts: the South and North Forks upstream from and west of Highway 12, and the upper and lower portions of the main channel. Each reach and its surrounding landscape has its own particular conditions and problems. The creek drains the western portion of the Lake Mendota watershed, about 12% of the total watershed area, supplies about 5% of the total surface water runoff to the lake. The creek is fed by swales and brooks in farm- and woodlands atop the Milton Moraine, and crosses a large area of lacustrine plain that underlies much of the Middleton area.

1.5. Purpose of This Report

Recent discussions have centered on the potential benefits and detriments of converting current woodchip and gravel (crushed limestone) hiking, biking, and multi-use trails within Pheasant Branch Conservancy to blacktop or paved trails. The Friends of Pheasant Branch felt an analysis of soil suitability and limitations could inform this discussion. As scientists looking for ways to make environmental information available to local decision makers, we have been interested in examining the usability of Web Soil Survey for better informing local resource management activities. The recent dialog provides such an opportunity.

We used Web Soil Survey to generate an objective analysis of soil suitability and limitations for recreational developments within the Pheasant Branch Conservancy. The results of our analyses and the conclusions we draw from reviewing the soils data are presented in this report.

2.0. Methods

When using Web Soil Survey, the first step is to define an area of interest (AOI), which serves as the study's unit of analysis. Users can use the tool's interactive map to define an area up to 10,000 acres by using the AOI icons on the map toolbar. We used the polygon AOI tool to delineate the boundaries of Pheasant Branch Conservancy.

First, we zoomed to Dane County using a pull down menu in the AOI window. We then manually zoomed to the vicinity of Pheasant Branch Conservancy and activated the draw AOI polygon tool. We then carefully drew the AOI polygon by pointing and clicking on vertices (i.e., corner points) to match the conservancy boundaries with the highest possible precision. Web Soil Survey does not provide the capability to upload geographic information system (GIS) or other computer aided design (CAD) boundary files. We selected two base "layers" for display in the interactive map as we drew the AOI: aerial imagery and Public Land Survey (PLSS) township/range and section boundaries, which match Pheasant Branch Conservancy's boundaries over much of its perimeter. We used printed and digital maps of the conservancy boundary, also overlaying aerial photography, for visual reference as we drew the AOI. Aerial imagery clearly shows roads, buildings, and changes in land cover indicating the conservancy boundary in some areas. Careful attention was paid to these and to other visual reference points, which we could zoom in to for closer viewing on our digital reference map of the boundary.

Once we delineated our AOI (i.e. Pheasant Branch Conservancy on the north side of Century Avenue), we used Web Soil Survey to create a soil map for the area. The soil map shows each kind of soil present in the AOI using map unit symbols. A "Map Unit Legend Summary" table shows the name and map symbol of each map unit depicted on the map, the percent of each map unit in the AOI, and the total acreage of each map unit in the AOI. Web Soil Survey also provides descriptions of each map unit. The soil map and associated map unit information we generated for the Pheasant Branch Conservancy AOI is included in Section 3.1 of this report.

Web Soil Survey allows users to view soil information (reports) about specific uses, such as cropland, forestland, rangeland, or urban development, by selecting uses from various drop-down lists. We used Web Soil Survey to conduct various suitability analyses of the soil units depicted on the Pheasant Branch Conservancy AOI soil map. Although Pheasant Branch Conservancy was originally preserved for its flood control and prevention functions, the property is managed primarily as a conservation and outdoor recreation area. Therefore we focused our suitability analyses on recreation and related building development.

Soil Survey reports include a number of interpretations specifying the suitability and limitations of soils for various uses, including the following:

Picnic areas – natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas.

Playgrounds – areas used intensively for such games as baseball, football, and soccer, and for restrooms, parking areas, and outbuildings. Playgrounds

require nearly level soils that are free of stones and that can withstand heavy foot traffic while maintaining adequate vegetation.

Paths and trails – areas used for walking, horseback riding, and other uses. They require little cutting and filling for slope modification.

We also looked at the suitability of soils relative to road construction. The ratings in the "Suitability for Roads (Natural Surface)" interpretation indicate the site's suitability for using the natural surface of the soil for roads. In contrast, the "Suitability for Local Roads and Streets" interpretation addresses site suitability for roads with an all-weather surface and the capacity to carry automobile and light truck traffic all year. Such roads have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or soil material stabilized by lime or cement, and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder.

For all of these analyses, suitability ratings are based on the properties of the individual soil types present in the area. These properties include such factors as slope, stoniness, depth to a water table, ponding, flooding, slope, texture of the surface layer, soil strength, subsidence, linear extensibility (shrink-swell potential), and the potential for frost action. These properties are more fully documented in the "Description" of the ratings found in the individual suitability analysis reports (Sections 3.2-3.6 of this report).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. In these cases, good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected in these situations. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected on "very limited" soils.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00). In all cases, Web Soils Survey uses a "dominant condition" aggregation method for its analyses.

3.0. Findings

This section of our report includes the actual soil map and associated data table (Section 3.1.) and various suitability analysis reports (Sections 3.2-3.6) generated by Web Soil Survey for the Pheasant Branch Conservancy AOI. These maps, tables, and accompanying text are reproduced verbatim as generated by Web Soil Survey. Conclusions based on our analysis of these reports are presented in Section 4.0.

3.1. Soil Map of Pheasant Branch Conservancy

The soil map depicts soil types (map units) in the Pheasant Branch Conservancy AOI. A "Map Legend" on the page following the map provides a key to the symbols used on the map. Information on the data source (NRCS certified data), underlying aerial imagery, and the map scale are also provided. The "Map Unit Legend" table shows the name and map symbol of each map unit depicted on the map, the percent of each map unit (soil type) in the Pheasant Branch Conservancy AOI, and the total acreage of each map unit (soil type) in the Pheasant Branch Conservancy AOI.

In observing the soils map for the Pheasant Branch Conservancy (page 9), you will note that the 33 acre area in the heart of the conservancy (north of Century Avenue and west of Pheasant Branch Road), that runs north to south along the creek and migrates outward, is classified as Marsh (indicated by the Mb symbol). This represents a little over 6% of the AOI. The soils in this area are either under water or highly saturated or frozen during the year and as a result cannot be manipulated to support a structural surface.

Much of the soil in the 245 acres surrounding the marsh (45.5% of the AOI) is classified as Houghton Muck (Ho). These soils are very sticky, fibrous soils containing decaying vegetation and other natural materials that do not conform well to revising the surface of the soils. They also do not support reshaping and capping with other materials as the shallow water table and propensity to remain wet throughout the year causes them to return to their original shape on the ground. These soils are found primarily just north of Century Avenue and run along the west side of Pheasant Branch Conservancy at the bottom of the slope along the property boundary of the Conservancy Condos. You will typically see marsh grasses, sedges, reeds, and cattails growing on these soils.

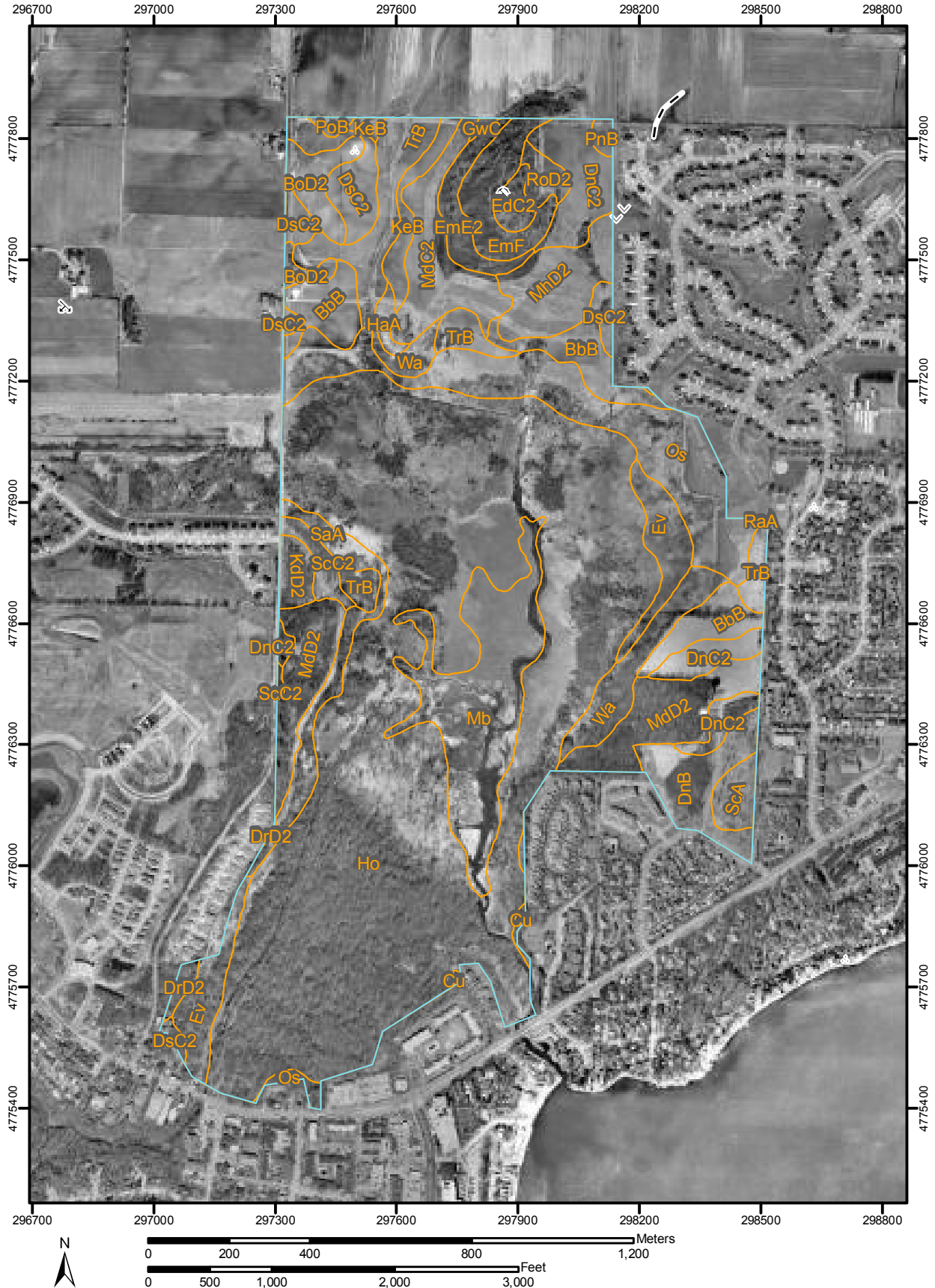
The soils on the lower slopes as you rise from the marsh are primarily silty clay loams (e.g., SaA, Wa, etc.) that have steep and wet features and which are kept in place by a cover of established (rooted) vegetation. These soils can be very slippery to hike on in the steeper sloped areas, especially when wet.

As you continue toward the upper slope from the marsh area, the soils have more sand in them and are called silt loams (e.g., TrB, BbB, MdD2, Ev, Os, etc.) and have very steep features. To maintain these soils and prevent erosion from starting, an established cover of vegetation is essential.

To the north of the wet area of the conservancy on the north side of the springs, you will encounter steeply rising slopes leading to the County Park overlook. Soils along this hill are silt or silt loams (e.g., MhD2 and MdC2) with up to 20% slopes in some areas. Again, to avoid surface erosion, gullies and ruts, these soils must have vegetative cover. This is an area where deep rooted, native plants have been reestablished successfully as part of prairie restoration efforts.

On the east side of the conservancy, near Orchid Heights Park, you will find significant amounts of a wet silt loam (e.g., DnC2) which would be difficult to conform to the shape of a trail as it absorbs water from rainfall and has a high water table which keeps the soil wet much of the year. Due to wetness, soils are difficult to shape and retain for different structural uses.


Soil Map



Soil Map Legend

MAP LEGEND






















Area of Interest (AOI)


 Area of Interest (AOI)

Soils


 Soil Map Units

Special Point Features




-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot

 Very Stony Spot

 Wet Spot

 Other

Special Line Features

-  Gully
-  Short Steep Slope
-  Other

Transportation

 Rails

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: UTM Zone 16N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dane County, Wisconsin
 Survey Area Data: Version 5, Dec 22, 2006

Date(s) aerial images were photographed: 2000

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Dane County, Wisconsin (WI025)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BbB	Batavia silt loam, gravelly substratum, 2 to 6 percent slopes	20.0	3.7%
BoD2	Boyer sandy loam, 12 to 20 percent slopes, eroded	7.4	1.4%
Cu	Cut and fill land	0.8	0.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	11.4	2.1%
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	17.9	3.3%
DrD2	Dresden loam, 12 to 20 percent slopes, eroded	1.3	0.3%
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	12.3	2.3%
EdC2	Edmund silt loam, 6 to 12 percent slopes, eroded	2.7	0.5%
EmE2	Elk mound sandy loam, 20 to 30 percent slopes, eroded	6.1	1.1%
EmF	Elk mound sandy loam, 30 to 60 percent slopes	9.9	1.8%
Ev	Elvers silt loam	14.5	2.7%
GwC	Griswold loam, 6 to 12 percent slopes	0.4	0.1%
HaA	Hayfield silt loam, 0 to 3 percent slopes	1.7	0.3%
Ho	Houghton muck	245.1	45.5%
KdD2	Kidder loam, 12 to 20 percent slopes, eroded	3.4	0.6%
KeB	Kegonsa silt loam, 2 to 6 percent slopes	5.4	1.0%
Mb	Marsh	33.6	6.2%
MdC2	McHenry silt loam, 6 to 12 percent slopes, eroded	14.9	2.8%
MdD2	McHenry silt loam, 12 to 20 percent slopes, eroded	24.9	4.6%
MhD2	Military loam, 12 to 20 percent slopes, eroded	12.9	2.4%
Os	Orion silt loam, wet	37.2	6.9%
PnB	Plano silt loam, 2 to 6 percent slopes	1.0	0.2%
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	0.9	0.2%

Dane County, Wisconsin (WI025)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RaA	Radford silt loam, 0 to 3 percent slopes	0.0	0.0%
RoD2	Rockton silt loam, 12 to 30 percent slopes, eroded	2.9	0.5%
SaA	Sable silty clay loam, 0 to 3 percent slopes	10.7	2.0%
ScA	St. Charles silt loam, 0 to 2 percent slopes	3.9	0.7%
ScC2	St. Charles silt loam, 6 to 12 percent slopes, eroded	3.5	0.6%
TrB	Troxel silt loam, 1 to 3 percent slopes	19.8	3.7%
Wa	Wacousta silty clay loam	12.4	2.3%
Totals for Area of Interest (AOI)		538.7	100.0%

3.2. Suitability of Soils for Paths and Trails

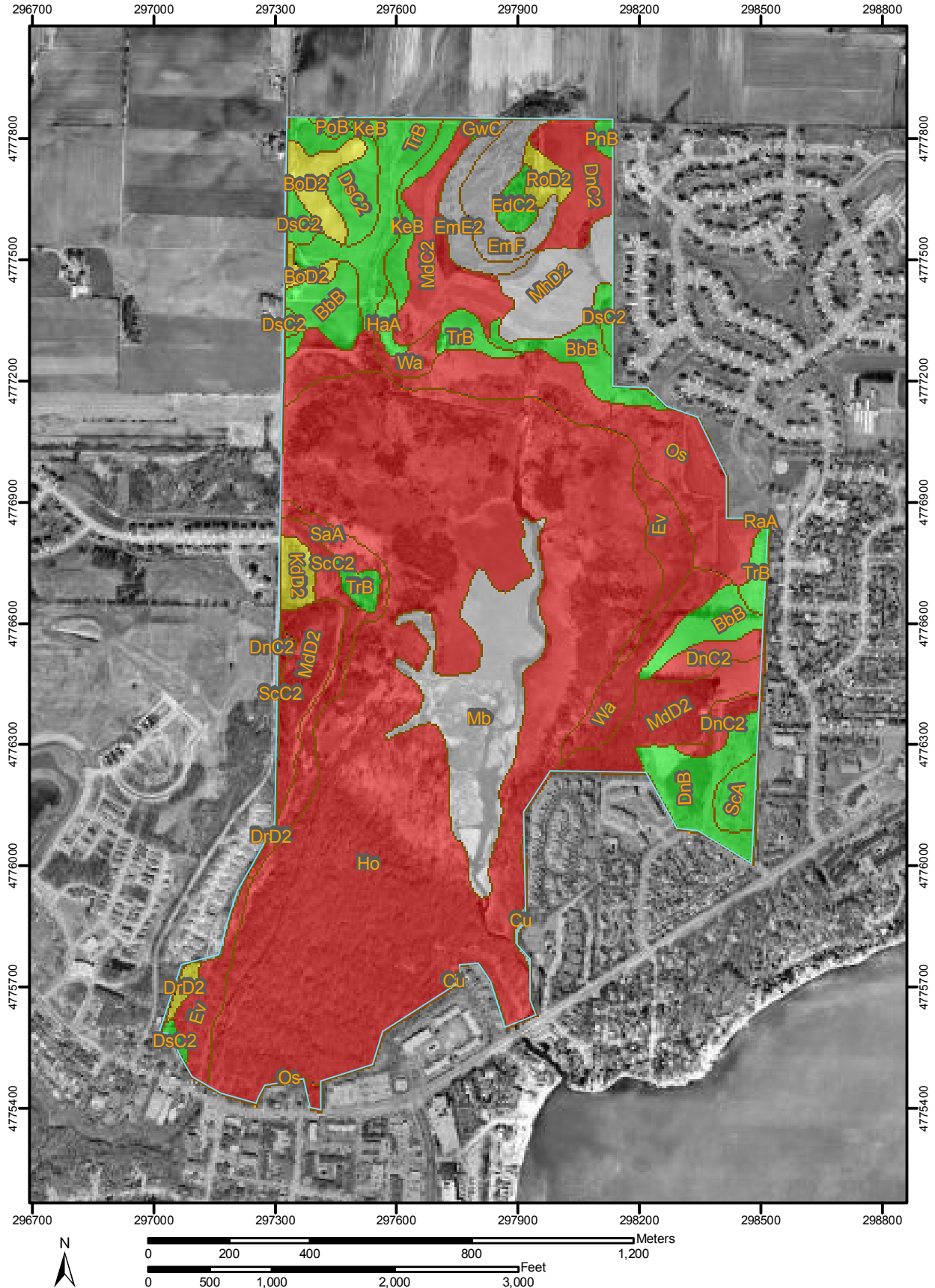
Web Soil Survey defines paths and trails as “areas used for walking, horseback riding, and other uses. They require little cutting and filling for slope modification.” We used Web Soil Survey to generate the suitability analysis for paths and trails included here.

The “Paths and Trails” map depicts the soil ratings for each soil type (map unit) in the Pheasant Branch Conservancy AOI. A “Map Legend” on the page following the map provides a key to the symbols used on the map. Information on the data source (NRCS certified data), underlying aerial imagery, and scale are also provided.

The “Paths and Trails – Summary by Map Unit” table shows the name and map symbol of each map unit (soil type), the suitability rating for each map unit, the reasons for the ratings and rating values for each map unit, the percentage of the Pheasant Branch Conservancy AOI that each map unit comprises, as well as the total acreage of each map unit within the Pheasant Branch Conservancy AOI. The shorter “Summary by Rating Value” table that follows the “Summary by Map Unit” table identifies the total acreage and percent of the Pheasant Branch Conservancy AOI in each rating classification (very limited, not limited, somewhat limited, and null or not rated).

Most soils in Pheasant Branch Conservancy are “very limited” (70% of the area) or “somewhat limited” (2.8% of the area) in their suitability for paths and trails. Only 14.7% of the area has soils rated as “not limited” for paths and trails. The areas that are “not limited” are primarily smaller upland areas in the northern and southeastern parts of the conservancy, some of the same areas that are “not limited” for picnic areas and playgrounds. The marsh (Mb) areas in the center of the conservancy are unrated, but it is clear that these areas would be unsuitable for paths and trails as they are generally saturated or inundated all year.


Map—Paths and Trails



Map Legend—Paths and Trails

MAP LEGEND

Area of Interest (AOI)


 Area of Interest (AOI)


Soils


 Soil Map Units

Soil Ratings


 Very limited

 Somewhat limited

 Not limited

 Not rated or not available

Transportation

 Rails

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 16N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dane County, Wisconsin
Survey Area Data: Version 5, Dec 22, 2006

Date(s) aerial images were photographed: 2000

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Paths and Trails

Paths and Trails— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
BbB	Batavia silt loam, gravelly substratum, 2 to 6 percent slopes	Not limited	Batavia, gravelly substratum (100%)		20.0	3.7%
BoD2	Boyer sandy loam, 12 to 20 percent slopes, eroded	Somewhat limited	Boyer (100%)	Slope (0.02)	7.4	1.4%
Cu	Cut and fill land	Not rated	Cut and fill land (100%)		0.8	0.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	Not limited	Dodge (100%)		11.4	2.1%
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	Very limited	Dodge (100%)	Water erosion (1.00)	17.9	3.3%
DrD2	Dresden loam, 12 to 20 percent slopes, eroded	Somewhat limited	Dresden (100%)	Slope (0.02)	1.3	0.3%
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	Not limited	Dresden (100%)		12.3	2.3%
EdC2	Edmund silt loam, 6 to 12 percent slopes, eroded	Not limited	Edmund (100%)		2.7	0.5%
EmE2	Elkound sandy loam, 20 to 30 percent slopes, eroded	Not rated	Elkound (100%)		6.1	1.1%
EmF	Elkound sandy loam, 30 to 60 percent slopes	Not rated	Elkound (100%)		9.9	1.8%
Ev	Elvers silt loam	Very limited	Elvers (100%)	Depth to saturated zone (1.00)	14.5	2.7%
				Ponding (1.00)		
				Flooding (0.40)		
GwC	Griswold loam, 6 to 12 percent slopes	Not limited	Griswold (100%)		0.4	0.1%
HaA	Hayfield silt loam, 0 to 3 percent slopes	Not limited	Hayfield (100%)		1.7	0.3%

Paths and Trails— Summary by Map Unit — Dane County, Wisconsin

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
Ho	Houghton muck	Very limited	Houghton (100%)	Depth to saturated zone (1.00)	245.1	45.5%
				Organic matter content (1.00)		
				Ponding (1.00)		
KdD2	Kidder loam, 12 to 20 percent slopes, eroded	Somewhat limited	Kidder (100%)	Slope (0.02)	3.4	0.6%
KeB	Kegonsa silt loam, 2 to 6 percent slopes	Not limited	Kegonsa (100%)		5.4	1.0%
Mb	Marsh	Not rated	Marsh (100%)		33.6	6.2%
MdC2	McHenry silt loam, 6 to 12 percent slopes, eroded	Very limited	McHenry (100%)	Water erosion (1.00)	14.9	2.8%
MdD2	McHenry silt loam, 12 to 20 percent slopes, eroded	Very limited	McHenry (100%)	Water erosion (1.00)	24.9	4.6%
				Slope (0.02)		
MhD2	Military loam, 12 to 20 percent slopes, eroded	Not rated	Military (100%)		12.9	2.4%
Os	Orion silt loam, wet	Very limited	Orion, wet (100%)	Depth to saturated zone (1.00)	37.2	6.9%
				Ponding (1.00)		
				Flooding (0.40)		
PnB	Plano silt loam, 2 to 6 percent slopes	Not limited	Plano (100%)		1.0	0.2%
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	Not limited	Plano, gravelly substratum (100%)		0.9	0.2%
RaA	Radford silt loam, 0 to 3 percent slopes	Somewhat limited	Radford (100%)	Flooding (0.40)	0.0	0.0%
RoD2	Rockton silt loam, 12 to 30 percent slopes, eroded	Somewhat limited	Rockton (100%)	Slope (0.68)	2.9	0.5%
SaA	Sable silty clay loam, 0 to 3 percent slopes	Very limited	Sable (100%)	Depth to saturated zone (1.00)	10.7	2.0%
				Ponding (1.00)		
ScA	St. Charles silt loam, 0 to 2 percent slopes	Not limited	St. Charles (100%)		3.9	0.7%

Paths and Trails— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
ScC2	St. Charles silt loam, 6 to 12 percent slopes, eroded	Very limited	St. Charles (100%)	Water erosion (1.00)	3.5	0.6%
TrB	Troxel silt loam, 1 to 3 percent slopes	Not limited	Troxel (100%)		19.8	3.7%
Wa	Wacousta silty clay loam	Very limited	Wacousta (100%)	Depth to saturated zone (1.00)	12.4	2.3%
				Ponding (1.00)		
Totals for Area of Interest (AOI)					538.7	100.0%

Paths and Trails— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	381.0	70.7%
Not limited	79.4	14.7%
Somewhat limited	15.0	2.8%
Null or Not Rated	63.3	11.7%

3.3. Suitability of Soils for Picnic Areas

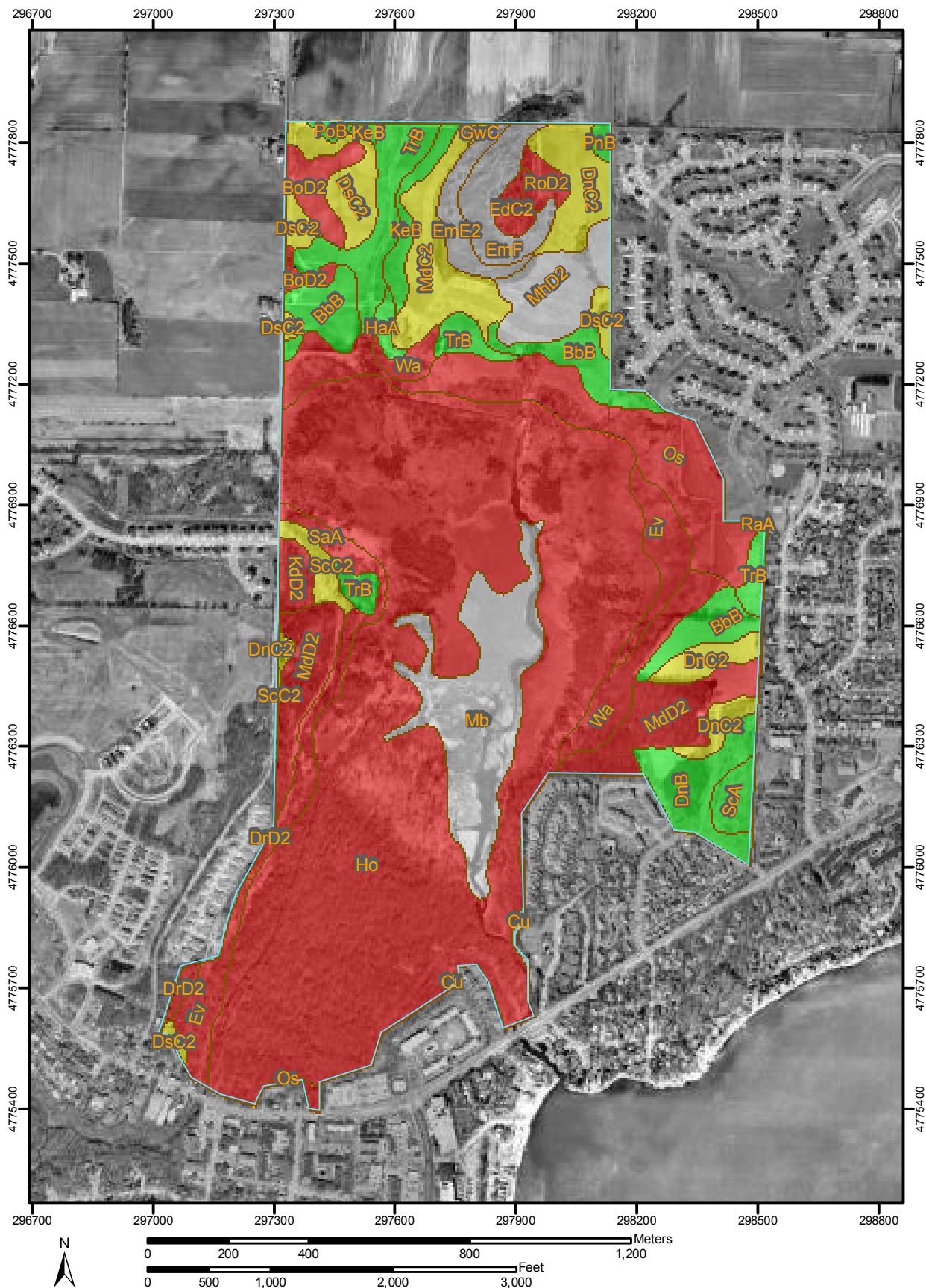
Web Soil Survey defines picnic areas as “natural or landscaped tracts used primarily for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas.” We used Web Soil Survey to generate the suitability analysis for picnic areas included here.

The “Suitability for Picnic Areas” map depicts the soil ratings for each soil type (map unit) in the Pheasant Branch Conservancy AOI. A “Map Legend” on the page following the map provides a key to the symbols used on the map. Information on the data source (NRCS certified data), underlying aerial imagery, and scale are also provided.

The “Picnic Areas – Summary by Map Unit” table shows the name and map symbol of each map unit (soil type) depicted on the map, the suitability rating for each map unit, the reasons for the ratings and rating values for each map unit, the percentage of the Pheasant Branch Conservancy AOI that each map unit comprises, as well as the total acreage of each map unit within the Pheasant Branch Conservancy AOI. The shorter “Summary by Rating Value” table that follows the “Summary by Map Unit” table identifies the total acreage and percent of the Pheasant Branch Conservancy AOI in each rating classification (very limited, not limited, somewhat limited, and null or not rated).

Most soils in Pheasant Branch Conservancy are “very limited” (67.3% of the area) or “somewhat limited” (9.1% of the area) in their suitability for picnic areas. Only 11.9% of the area has soils rated as “not limited” for picnic areas. The areas that are “not limited” are primarily smaller upland areas in the northern and southeastern parts of the conservancy, some of the same areas that are “not limited” for paths and trails. The marsh (Mb) areas in the center of the conservancy are unrated, but it is clear that these areas would be unsuitable for picnic areas as they are generally saturated or inundated all year.


Map—Picnic Areas



Map Legend—Picnic Areas

MAP LEGEND

Area of Interest (AOI)


 Area of Interest (AOI)


Soils


 Soil Map Units

Soil Ratings

 Very limited

 Somewhat limited

 Not limited

 Not rated or not available

Transportation

 Rails

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 16N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dane County, Wisconsin
Survey Area Data: Version 5, Dec 22, 2006

Date(s) aerial images were photographed: 2000

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Picnic Areas

Picnic Areas— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
BbB	Batavia silt loam, gravelly substratum, 2 to 6 percent slopes	Not limited	Batavia, gravelly substratum (100%)		20.0	3.7%
BoD2	Boyer sandy loam, 12 to 20 percent slopes, eroded	Very limited	Boyer (100%)	Slope (1.00)	7.4	1.4%
Cu	Cut and fill land	Not rated	Cut and fill land (100%)		0.8	0.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	Not limited	Dodge (100%)		11.4	2.1%
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	Somewhat limited	Dodge (100%)	Slope (0.04)	17.9	3.3%
DrD2	Dresden loam, 12 to 20 percent slopes, eroded	Very limited	Dresden (100%)	Slope (1.00)	1.3	0.3%
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	Somewhat limited	Dresden (100%)	Slope (0.04)	12.3	2.3%
EdC2	Edmund silt loam, 6 to 12 percent slopes, eroded	Very limited	Edmund (100%)	Depth to bedrock (1.00)	2.7	0.5%
				Slow water movement (0.94)		
				Slope (0.04)		
EmE2	Elk mound sandy loam, 20 to 30 percent slopes, eroded	Not rated	Elk mound (100%)		6.1	1.1%
EmF	Elk mound sandy loam, 30 to 60 percent slopes	Not rated	Elk mound (100%)		9.9	1.8%
Ev	Elvers silt loam	Very limited	Elvers (100%)	Ponding (1.00)	14.5	2.7%
				Depth to saturated zone (1.00)		
				Flooding (0.40)		
GwC	Griswold loam, 6 to 12 percent slopes	Somewhat limited	Griswold (100%)	Slope (0.04)	0.4	0.1%
HaA	Hayfield silt loam, 0 to 3 percent slopes	Not limited	Hayfield (100%)		1.7	0.3%

Picnic Areas— Summary by Map Unit — Dane County, Wisconsin

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
Ho	Houghton muck	Very limited	Houghton (100%)	Ponding (1.00)	245.1	45.5%
				Depth to saturated zone (1.00)		
				Organic matter content (1.00)		
KdD2	Kidder loam, 12 to 20 percent slopes, eroded	Very limited	Kidder (100%)	Slope (1.00)	3.4	0.6%
KeB	Kegonsa silt loam, 2 to 6 percent slopes	Not limited	Kegonsa (100%)		5.4	1.0%
Mb	Marsh	Not rated	Marsh (100%)		33.6	6.2%
MdC2	McHenry silt loam, 6 to 12 percent slopes, eroded	Somewhat limited	McHenry (100%)	Slope (0.04)	14.9	2.8%
MdD2	McHenry silt loam, 12 to 20 percent slopes, eroded	Very limited	McHenry (100%)	Slope (1.00)	24.9	4.6%
MhD2	Military loam, 12 to 20 percent slopes, eroded	Not rated	Military (100%)		12.9	2.4%
Os	Orion silt loam, wet	Very limited	Orion, wet (100%)	Ponding (1.00)	37.2	6.9%
				Depth to saturated zone (1.00)		
				Flooding (0.40)		
PnB	Plano silt loam, 2 to 6 percent slopes	Not limited	Plano (100%)		1.0	0.2%
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	Not limited	Plano, gravelly substratum (100%)		0.9	0.2%
RaA	Radford silt loam, 0 to 3 percent slopes	Somewhat limited	Radford (100%)	Flooding (0.40)	0.0	0.0%
				Depth to saturated zone (0.19)		
RoD2	Rockton silt loam, 12 to 30 percent slopes, eroded	Very limited	Rockton (100%)	Slope (1.00)	2.9	0.5%
SaA	Sable silty clay loam, 0 to 3 percent slopes	Very limited	Sable (100%)	Ponding (1.00)	10.7	2.0%
				Depth to saturated zone (1.00)		

Picnic Areas— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
ScA	St. Charles silt loam, 0 to 2 percent slopes	Not limited	St. Charles (100%)		3.9	0.7%
ScC2	St. Charles silt loam, 6 to 12 percent slopes, eroded	Somewhat limited	St. Charles (100%)	Slope (0.04)	3.5	0.6%
TrB	Troxel silt loam, 1 to 3 percent slopes	Not limited	Troxel (100%)		19.8	3.7%
Wa	Wacousta silty clay loam	Very limited	Wacousta (100%)	Ponding (1.00)	12.4	2.3%
				Depth to saturated zone (1.00)		
Totals for Area of Interest (AOI)					538.7	100.0%

Picnic Areas— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	362.4	67.3%
Not limited	64.0	11.9%
Somewhat limited	49.0	9.1%
Null or Not Rated	63.3	11.7%

3.4. Suitability of Soils for Playgrounds

Web Soil Survey defines playgrounds as “areas used intensively for games like baseball, football, and soccer, as well as for restrooms, parking areas, and outbuildings. Playgrounds require nearly level soils that are free of stones and that can withstand heavy foot traffic while maintaining adequate vegetation.” We used Web Soil Survey to generate the suitability analysis for playgrounds included here.

The “Suitability for Playgrounds” map depicts the soil ratings for each soil type (map unit) in the Pheasant Branch Conservancy AOI. A “Map Legend” on the page following the map provides a key to the symbols used on the map. Information on the data source (NRCS certified data), underlying aerial imagery, and scale are also provided.


The “Playgrounds – Summary by Map Unit” table shows the name and map symbol of each map unit (soil type), the suitability rating for each map unit depicted on the map, the reasons for the ratings and rating values for each map unit, the percentage of the Pheasant Branch Conservancy AOI that each map unit comprises, as well as the total acreage of each map unit within the Pheasant Branch Conservancy AOI. The shorter “Summary by Rating Value” table that follows the “Summary by Map Unit” table identifies the total acreage and percent of the Pheasant Branch Conservancy AOI in each rating classification (very limited, not limited, somewhat limited, and null or not rated).

Most soils in Pheasant Branch Conservancy are “very limited” (76.4% of the area) or “somewhat limited” (7.2% of the area) in their suitability for playgrounds. Only 14.7% of the area has soils rated as “not limited” for playgrounds. The areas that are “not limited” are primarily smaller upland areas in the northern and southeastern parts of the conservancy, some of the same areas that are “not limited” for paths and trails and picnic areas. The marsh (Mb) areas in the center of the conservancy are unrated, but it is clear that these areas would be unsuitable for playgrounds as they are generally saturated or inundated all year.

Map Legend—Playgrounds

MAP LEGEND

Area of Interest (AOI)


 Area of Interest (AOI)


Soils


 Soil Map Units

Soil Ratings

 Very limited

 Somewhat limited

 Not limited

 Not rated or not available

Transportation

 Rails

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 16N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dane County, Wisconsin
Survey Area Data: Version 5, Dec 22, 2006

Date(s) aerial images were photographed: 2000

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Playgrounds

Playgrounds— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
BbB	Batavia silt loam, gravelly substratum, 2 to 6 percent slopes	Somewhat limited	Batavia, gravelly substratum (100%)	Slope (0.50)	20.0	3.7%
BoD2	Boyer sandy loam, 12 to 20 percent slopes, eroded	Very limited	Boyer (100%)	Slope (1.00)	7.4	1.4%
				Gravel content (0.18)		
Cu	Cut and fill land	Not rated	Cut and fill land (100%)		0.8	0.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	Somewhat limited	Dodge (100%)	Slope (0.50)	11.4	2.1%
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	Very limited	Dodge (100%)	Slope (1.00)	17.9	3.3%
DrD2	Dresden loam, 12 to 20 percent slopes, eroded	Very limited	Dresden (100%)	Slope (1.00)	1.3	0.3%
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	Very limited	Dresden (100%)	Slope (1.00)	12.3	2.3%
EdC2	Edmund silt loam, 6 to 12 percent slopes, eroded	Very limited	Edmund (100%)	Slope (1.00)	2.7	0.5%
				Depth to bedrock (1.00)		
				Slow water movement (0.94)		
EmE2	Elkound sandy loam, 20 to 30 percent slopes, eroded	Not rated	Elkound (100%)		6.1	1.1%
EmF	Elkound sandy loam, 30 to 60 percent slopes	Not rated	Elkound (100%)		9.9	1.8%
Ev	Elvers silt loam	Very limited	Elvers (100%)	Depth to saturated zone (1.00)	14.5	2.7%
				Flooding (1.00)		
				Ponding (1.00)		
GwC	Griswold loam, 6 to 12 percent slopes	Very limited	Griswold (100%)	Slope (1.00)	0.4	0.1%
HaA	Hayfield silt loam, 0 to 3 percent slopes	Not limited	Hayfield (100%)		1.7	0.3%

Playgrounds— Summary by Map Unit — Dane County, Wisconsin

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
Ho	Houghton muck	Very limited	Houghton (100%)	Depth to saturated zone (1.00)	245.1	45.5%
				Organic matter content (1.00)		
				Ponding (1.00)		
KdD2	Kidder loam, 12 to 20 percent slopes, eroded	Very limited	Kidder (100%)	Slope (1.00)	3.4	0.6%
				Gravel content (0.06)		
KeB	Kegonsa silt loam, 2 to 6 percent slopes	Somewhat limited	Kegonsa (100%)	Slope (0.50)	5.4	1.0%
Mb	Marsh	Not rated	Marsh (100%)		33.6	6.2%
MdC2	McHenry silt loam, 6 to 12 percent slopes, eroded	Very limited	McHenry (100%)	Slope (1.00)	14.9	2.8%
MdD2	McHenry silt loam, 12 to 20 percent slopes, eroded	Very limited	McHenry (100%)	Slope (1.00)	24.9	4.6%
MhD2	Military loam, 12 to 20 percent slopes, eroded	Not rated	Military (100%)		12.9	2.4%
Os	Orion silt loam, wet	Very limited	Orion, wet (100%)	Depth to saturated zone (1.00)	37.2	6.9%
				Flooding (1.00)		
				Ponding (1.00)		
PnB	Plano silt loam, 2 to 6 percent slopes	Somewhat limited	Plano (100%)	Slope (0.50)	1.0	0.2%
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	Somewhat limited	Plano, gravelly substratum (100%)	Slope (0.50)	0.9	0.2%
RaA	Radford silt loam, 0 to 3 percent slopes	Very limited	Radford (100%)	Flooding (1.00)	0.0	0.0%
				Depth to saturated zone (0.39)		
RoD2	Rockton silt loam, 12 to 30 percent slopes, eroded	Very limited	Rockton (100%)	Slope (1.00)	2.9	0.5%
				Depth to bedrock (0.42)		
SaA	Sable silty clay loam, 0 to 3 percent slopes	Very limited	Sable (100%)	Depth to saturated zone (1.00)	10.7	2.0%
				Ponding (1.00)		

Playgrounds— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
ScA	St. Charles silt loam, 0 to 2 percent slopes	Not limited	St. Charles (100%)		3.9	0.7%
ScC2	St. Charles silt loam, 6 to 12 percent slopes, eroded	Very limited	St. Charles (100%)	Slope (1.00)	3.5	0.6%
TrB	Troxel silt loam, 1 to 3 percent slopes	Not limited	Troxel (100%)		19.8	3.7%
Wa	Wacousta silty clay loam	Very limited	Wacousta (100%)	Depth to saturated zone (1.00)	12.4	2.3%
				Ponding (1.00)		
Totals for Area of Interest (AOI)					538.7	100.0%

Playgrounds— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	411.4	76.4%
Somewhat limited	38.6	7.2%
Not limited	25.4	4.7%
Null or Not Rated	63.3	11.7%

3.5. Suitability of Soils for Roads (Natural Surfaces)

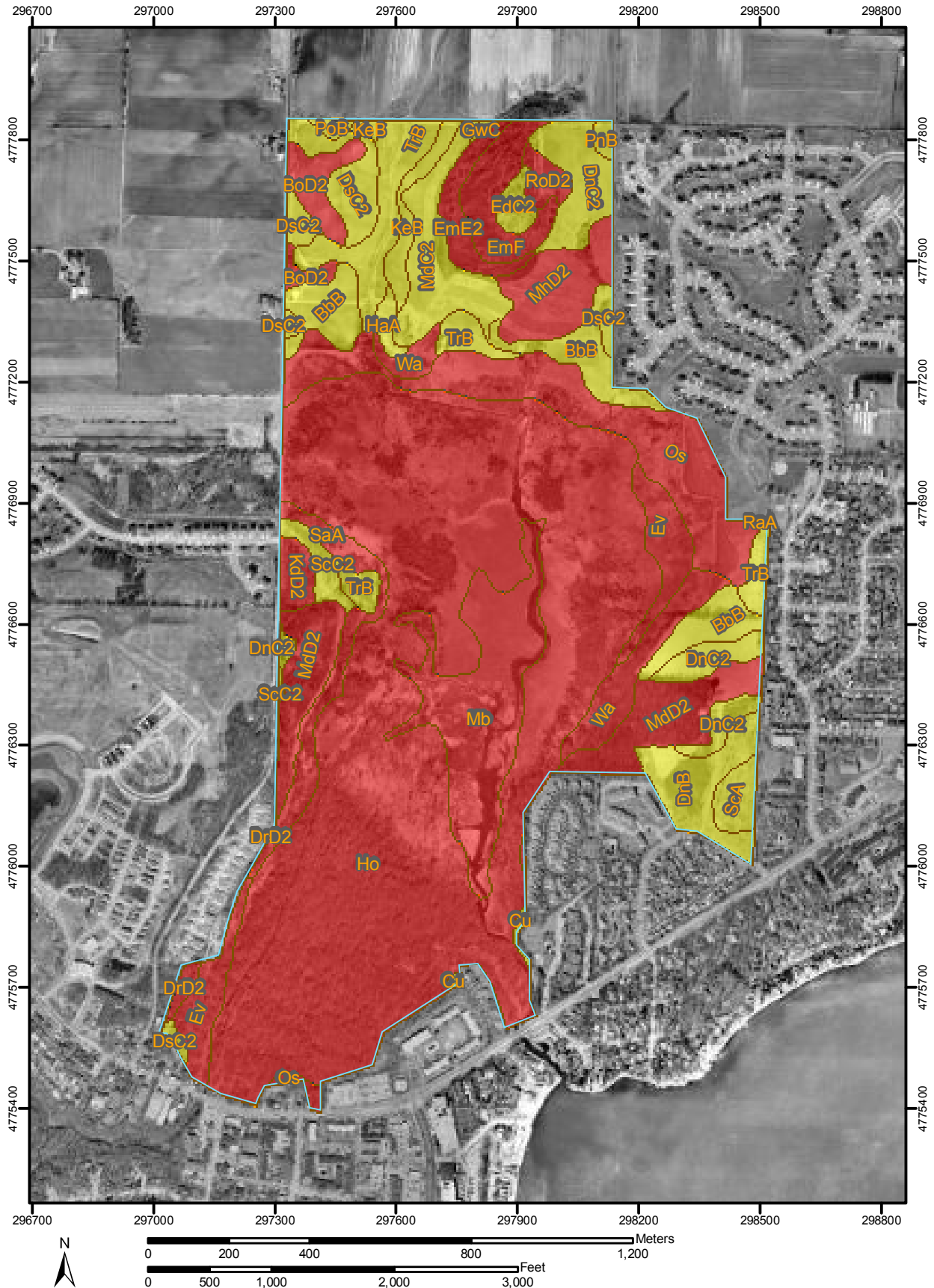
The Web Soil Survey ratings in this interpretation, Suitability for Roads (Natural Surface), indicate the suitability for using the natural surface of the soil for roads. The ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified Classification of the soil, depth to a water table, ponding, flooding, and the hazard of soil slippage. We used Web Soil Survey to generate the suitability analysis for roads included here.

The “Suitability for Roads (Natural Surfaces)” map depicts the soil ratings for each soil type (map unit) in the Pheasant Branch Conservancy AOI. A “Map Legend” on the page following the map provides a key to the symbols used on the map. Information on the data source (NRCS certified data), underlying aerial imagery, and scale are also provided.

The “Suitability for Roads (Natural Surfaces) – Summary by Map Unit” table shows the name and map symbol of each map unit (soil type) depicted on the map, the suitability rating for each map unit, the reasons for the ratings and rating values for each map unit, the percentage of the Pheasant Branch Conservancy AOI that each map unit comprises, as well as the total acreage of each map unit within the Pheasant Branch Conservancy AOI. The shorter “Summary by Rating Value” table that follows the “Summary by Map Unit” table identifies the total acreage and percent of the Pheasant Branch Conservancy AOI in each rating classification (well suited, moderately suited, poorly suited, or not rated).

Soils in Pheasant Branch Conservancy are either “poorly suited” (78.4% of the area) or only “moderately suited” (21.6% of the area) in their suitability for roads with natural surfaces. There are no areas within the conservancy boundaries that are “well suited” for roads.


Map—Suitability for Roads (Natural Surface)



Map Legend—Suitability for Roads (Natural Surface)

MAP LEGEND


Area of Interest (AOI)


 Area of Interest (AOI)

Soils


 Soil Map Units

Soil Ratings

 Poorly suited

 Moderately suited

 Well suited

 Not rated or not available

Transportation

 Rails

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 16N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dane County, Wisconsin
Survey Area Data: Version 5, Dec 22, 2006

Date(s) aerial images were photographed: 2000

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Suitability for Roads (Natural Surface)

Suitability for Roads (Natural Surface)— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
BbB	Batavia silt loam, gravelly substratum, 2 to 6 percent slopes	Moderately suited	Batavia, gravelly substratum (100%)	Sandiness (0.50)	20.0	3.7%
				Low strength (0.50)		
BoD2	Boyer sandy loam, 12 to 20 percent slopes, eroded	Poorly suited	Boyer (100%)	Slope (1.00)	7.4	1.4%
Cu	Cut and fill land	Moderately suited	Cut and fill land (100%)	Slope (0.50)	0.8	0.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	Moderately suited	Dodge (100%)	Low strength (0.50)	11.4	2.1%
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	Moderately suited	Dodge (100%)	Slope (0.50)	17.9	3.3%
				Low strength (0.50)		
DrD2	Dresden loam, 12 to 20 percent slopes, eroded	Poorly suited	Dresden (100%)	Slope (1.00)	1.3	0.3%
				Sandiness (0.50)		
				Low strength (0.50)		
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	Moderately suited	Dresden (100%)	Slope (0.50)	12.3	2.3%
				Sandiness (0.50)		
				Low strength (0.50)		
EdC2	Edmund silt loam, 6 to 12 percent slopes, eroded	Moderately suited	Edmund (100%)	Slope (0.50)	2.7	0.5%
				Low strength (0.50)		
EmE2	Elk mound sandy loam, 20 to 30 percent slopes, eroded	Poorly suited	Elk mound (100%)	Slope (1.00)	6.1	1.1%
EmF	Elk mound sandy loam, 30 to 60 percent slopes	Poorly suited	Elk mound (100%)	Slope (1.00)	9.9	1.8%
Ev	Elvers silt loam	Poorly suited	Elvers (100%)	Flooding (1.00)	14.5	2.7%
				Wetness (1.00)		
				Low strength (0.50)		
GwC	Griswold loam, 6 to 12 percent slopes	Moderately suited	Griswold (100%)	Slope (0.50)	0.4	0.1%
				Low strength (0.50)		
HaA	Hayfield silt loam, 0 to 3 percent slopes	Moderately suited	Hayfield (100%)	Low strength (0.50)	1.7	0.3%

Suitability for Roads (Natural Surface)— Summary by Map Unit — Dane County, Wisconsin

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
Ho	Houghton muck	Poorly suited	Houghton (100%)	Low strength (1.00)	245.1	45.5%
				Wetness (1.00)		
KdD2	Kidder loam, 12 to 20 percent slopes, eroded	Poorly suited	Kidder (100%)	Slope (1.00)	3.4	0.6%
				Low strength (0.50)		
KeB	Kegonsa silt loam, 2 to 6 percent slopes	Moderately suited	Kegonsa (100%)	Sandiness (0.50)	5.4	1.0%
				Low strength (0.50)		
Mb	Marsh	Poorly suited	Marsh (100%)	Flooding (1.00)	33.6	6.2%
				Low strength (1.00)		
MdC2	McHenry silt loam, 6 to 12 percent slopes, eroded	Moderately suited	McHenry (100%)	Slope (0.50)	14.9	2.8%
				Low strength (0.50)		
MdD2	McHenry silt loam, 12 to 20 percent slopes, eroded	Poorly suited	McHenry (100%)	Slope (1.00)	24.9	4.6%
				Low strength (0.50)		
MhD2	Military loam, 12 to 20 percent slopes, eroded	Poorly suited	Military (100%)	Slope (1.00)	12.9	2.4%
				Low strength (0.50)		
Os	Orion silt loam, wet	Poorly suited	Orion, wet (100%)	Flooding (1.00)	37.2	6.9%
				Wetness (1.00)		
				Low strength (0.50)		
PnB	Plano silt loam, 2 to 6 percent slopes	Moderately suited	Plano (100%)	Low strength (0.50)	1.0	0.2%
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	Moderately suited	Plano, gravelly substratum (100%)	Sandiness (0.50)	0.9	0.2%
				Low strength (0.50)		
RaA	Radford silt loam, 0 to 3 percent slopes	Poorly suited	Radford (100%)	Flooding (1.00)	0.0	0.0%
				Low strength (0.50)		
RoD2	Rockton silt loam, 12 to 30 percent slopes, eroded	Poorly suited	Rockton (100%)	Slope (1.00)	2.9	0.5%
				Low strength (0.50)		
SaA	Sable silty clay loam, 0 to 3 percent slopes	Poorly suited	Sable (100%)	Wetness (1.00)	10.7	2.0%
				Low strength (0.50)		
ScA	St. Charles silt loam, 0 to 2 percent slopes	Moderately suited	St. Charles (100%)	Low strength (0.50)	3.9	0.7%

Suitability for Roads (Natural Surface)— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
ScC2	St. Charles silt loam, 6 to 12 percent slopes, eroded	Moderately suited	St. Charles (100%)	Slope (0.50)	3.5	0.6%
				Low strength (0.50)		
TrB	Troxel silt loam, 1 to 3 percent slopes	Moderately suited	Troxel (100%)	Low strength (0.50)	19.8	3.7%
Wa	Wacousta silty clay loam	Poorly suited	Wacousta (100%)	Wetness (1.00)	12.4	2.3%
				Low strength (0.50)		
				Stickiness; high plasticity index (0.50)		
Totals for Area of Interest (AOI)					538.7	100.0%

Suitability for Roads (Natural Surface)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Poorly suited	422.2	78.4%
Moderately suited	116.5	21.6%

3.6. Suitability of Soils for Local Roads and Streets (Blacktop)

Web Soil Survey defines local roads and streets as having “an all-weather surface” [e.g., blacktop] and as being capable of carrying automobile and light truck traffic throughout the year. They “have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder.” Since Web Soil Survey does not provide suitability analyses for blacktopped multi-use trails, we used the Web Soils Survey suitability analysis for local roads and streets as a surrogate for such trails.

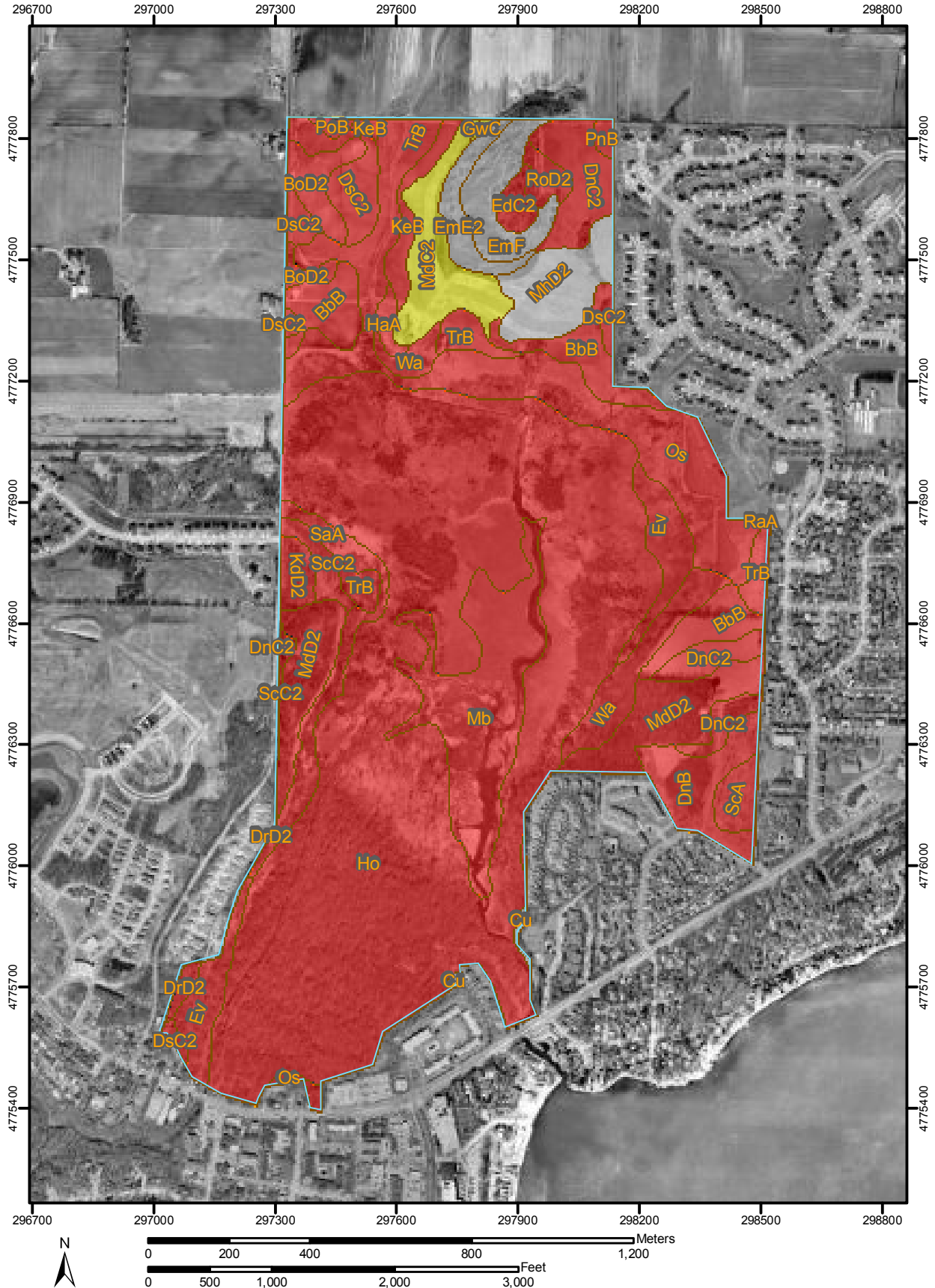
The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength, subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

The “Suitability for Local Roads and Streets” map depicts the soil ratings for each soil type (map unit) in the Pheasant Branch Conservancy AOI. A “Map Legend” on the page following the map provides a key to the symbols used on the map. Information on the data source (NRCS certified data), underlying aerial imagery, and scale are also provided.

The “Local Roads and Streets – Summary by Map Unit” table shows the name and map symbol of each map unit (soil type) depicted on the map, the suitability rating for each map unit, the reasons for ratings and rating values for each map unit, the percentage of the Pheasant Branch Conservancy AOI that each map unit comprises, as well as the total acreage of each map unit within the Pheasant Branch Conservancy AOI. The shorter “Summary by Rating Value” table that follows the “Summary by Map Unit” table identifies the total acreage and percent of the Pheasant Branch Conservancy AOI in each rating classification (very limited, not limited, somewhat limited, and null or not rated).

Most soils in Pheasant Branch Conservancy are “very limited” (91.6% of the area) or “somewhat limited” (2.8% of the area) in their suitability for roads and streets. There are no areas within the conservancy boundaries that are “not limited” for roads and streets. A small number of acres (5.5%), primarily atop the hill in the northern part of the conservancy, are unrated for this use.


Map—Local Roads and Streets



Map Legend—Local Roads and Streets

MAP LEGEND


Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Units

Soil Ratings

 Very limited

 Somewhat limited

 Not limited

 Not rated or not available

Transportation

 Rails

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: UTM Zone 16N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Dane County, Wisconsin
Survey Area Data: Version 5, Dec 22, 2006

Date(s) aerial images were photographed: 2000

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Tables—Local Roads and Streets

Local Roads and Streets— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
BbB	Batavia silt loam, gravelly substratum, 2 to 6 percent slopes	Very limited	Batavia, gravelly substratum (100%)	Frost action (1.00)	20.0	3.7%
				Low strength (1.00)		
				Shrink-swell (0.50)		
BoD2	Boyer sandy loam, 12 to 20 percent slopes, eroded	Very limited	Boyer (100%)	Slope (1.00)	7.4	1.4%
				Frost action (0.50)		
Cu	Cut and fill land	Not rated	Cut and fill land (100%)		0.8	0.1%
DnB	Dodge silt loam, 2 to 6 percent slopes	Very limited	Dodge (100%)	Frost action (1.00)	11.4	2.1%
				Low strength (1.00)		
				Shrink-swell (0.50)		
DnC2	Dodge silt loam, 6 to 12 percent slopes, eroded	Very limited	Dodge (100%)	Frost action (1.00)	17.9	3.3%
				Low strength (1.00)		
				Shrink-swell (0.50)		
				Slope (0.04)		
DrD2	Dresden loam, 12 to 20 percent slopes, eroded	Very limited	Dresden (100%)	Low strength (1.00)	1.3	0.3%
				Slope (1.00)		
				Shrink-swell (0.50)		
				Frost action (0.50)		
DsC2	Dresden silt loam, 6 to 12 percent slopes, eroded	Very limited	Dresden (100%)	Low strength (1.00)	12.3	2.3%
				Shrink-swell (0.50)		
				Frost action (0.50)		
				Slope (0.04)		

Local Roads and Streets— Summary by Map Unit — Dane County, Wisconsin

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
EdC2	Edmund silt loam, 6 to 12 percent slopes, eroded	Very limited	Edmund (100%)	Depth to hard bedrock (1.00)	2.7	0.5%
				Low strength (1.00)		
				Shrink-swell (0.50)		
				Frost action (0.50)		
				Slope (0.04)		
EmE2	Elkmound sandy loam, 20 to 30 percent slopes, eroded	Not rated	Elkmound (100%)		6.1	1.1%
EmF	Elkmound sandy loam, 30 to 60 percent slopes	Not rated	Elkmound (100%)		9.9	1.8%
Ev	Elvers silt loam	Very limited	Elvers (100%)	Ponding (1.00)	14.5	2.7%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
GwC	Griswold loam, 6 to 12 percent slopes	Somewhat limited	Griswold (100%)	Frost action (0.50)	0.4	0.1%
				Slope (0.04)		
HaA	Hayfield silt loam, 0 to 3 percent slopes	Very limited	Hayfield (100%)	Frost action (1.00)	1.7	0.3%
				Low strength (0.22)		
Ho	Houghton muck	Very limited	Houghton (100%)	Ponding (1.00)	245.1	45.5%
				Depth to saturated zone (1.00)		
				Subsidence (1.00)		
				Frost action (1.00)		
KdD2	Kidder loam, 12 to 20 percent slopes, eroded	Very limited	Kidder (100%)	Slope (1.00)	3.4	0.6%
				Shrink-swell (0.50)		
				Frost action (0.50)		

Local Roads and Streets— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
KeB	Kegonsa silt loam, 2 to 6 percent slopes	Very limited	Kegonsa (100%)	Frost action (1.00)	5.4	1.0%
				Low strength (1.00)		
				Shrink-swell (0.50)		
Mb	Marsh	Very limited	Marsh (100%)	Ponding (1.00)	33.6	6.2%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
MdC2	McHenry silt loam, 6 to 12 percent slopes, eroded	Somewhat limited	McHenry (100%)	Shrink-swell (0.50)	14.9	2.8%
				Frost action (0.50)		
				Low strength (0.22)		
				Slope (0.04)		
MdD2	McHenry silt loam, 12 to 20 percent slopes, eroded	Very limited	McHenry (100%)	Slope (1.00)	24.9	4.6%
				Shrink-swell (0.50)		
				Frost action (0.50)		
				Low strength (0.22)		
MhD2	Military loam, 12 to 20 percent slopes, eroded	Not rated	Military (100%)		12.9	2.4%
Os	Orion silt loam, wet	Very limited	Orion, wet (100%)	Ponding (1.00)	37.2	6.9%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Flooding (1.00)		
				Low strength (1.00)		
PnB	Plano silt loam, 2 to 6 percent slopes	Very limited	Plano (100%)	Frost action (1.00)	1.0	0.2%
				Low strength (1.00)		
				Shrink-swell (0.50)		

Local Roads and Streets— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
PoB	Plano silt loam, gravelly substratum, 2 to 6 percent slopes	Very limited	Plano, gravelly substratum (100%)	Frost action (1.00)	0.9	0.2%
				Low strength (1.00)		
				Shrink-swell (0.50)		
RaA	Radford silt loam, 0 to 3 percent slopes	Very limited	Radford (100%)	Frost action (1.00)	0.0	0.0%
				Flooding (1.00)		
				Low strength (1.00)		
				Depth to saturated zone (0.19)		
RoD2	Rockton silt loam, 12 to 30 percent slopes, eroded	Very limited	Rockton (100%)	Slope (1.00)	2.9	0.5%
				Shrink-swell (0.50)		
				Frost action (0.50)		
				Depth to hard bedrock (0.42)		
				Low strength (0.22)		
SaA	Sable silty clay loam, 0 to 3 percent slopes	Very limited	Sable (100%)	Ponding (1.00)	10.7	2.0%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.50)		
ScA	St. Charles silt loam, 0 to 2 percent slopes	Very limited	St. Charles (100%)	Frost action (1.00)	3.9	0.7%
				Low strength (1.00)		
				Shrink-swell (0.50)		
ScC2	St. Charles silt loam, 6 to 12 percent slopes, eroded	Very limited	St. Charles (100%)	Frost action (1.00)	3.5	0.6%
				Low strength (1.00)		
				Shrink-swell (0.50)		
				Slope (0.04)		

Local Roads and Streets— Summary by Map Unit — Dane County, Wisconsin						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (rating values)	Acres in AOI	Percent of AOI
TrB	Troxel silt loam, 1 to 3 percent slopes	Very limited	Troxel (100%)	Frost action (1.00)	19.8	3.7%
				Low strength (1.00)		
Wa	Wacousta silty clay loam	Very limited	Wacousta (100%)	Ponding (1.00)	12.4	2.3%
				Depth to saturated zone (1.00)		
				Frost action (1.00)		
				Low strength (1.00)		
				Shrink-swell (0.50)		
Totals for Area of Interest (AOI)					538.7	100.0%

Local Roads and Streets— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Very limited	493.7	91.6%
Somewhat limited	15.3	2.8%
Null or Not Rated	29.7	5.5%

4.0. Conclusions

More than half of the soils in the Pheasant Branch Conservancy AOI are under water, near saturation, or frozen during much of the year, making them unsuitable for many recreational uses/developments. The other primary soil types present in the AOI are high in silt content resulting in significant challenges for developing paths and trails, playgrounds, picnic areas, and roads due to their lack of cohesion when either wet or dry. The suitability analyses generated by Web Soil Survey show that 73.5% of soils in the AOI are somewhat or very limited in their suitability for paths and trails, 76.4% are somewhat or very limited in their suitability for picnic areas, 83.6% are somewhat or very limited in their suitability for playgrounds, 78.4% are poorly suited for roads with natural surfaces (the remaining 21.6% are only moderately suited), and 91.6% are very limited in their suitability for paved roads and streets. These findings underscore the logic of maintaining Pheasant Branch Conservancy in a primarily undeveloped state, especially for the flood prevention and control functions the predominant soil types provide.

We found that Web Soil Survey provides a user-friendly, intuitive means of accessing and evaluating soil survey information for local resource management applications. The tool is easily accessible via a standard Internet browser and is able to produce a wide variety of reports that can inform various land use and management decisions. Information from the detailed soil surveys can be presented and organized in a variety of ways.

5.0. References/Literature Cited

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About the Authors

Dreux J. Watermolen is an ecologist who currently serves as Chief of Science Information Services for the Wisconsin Department of Natural Resources. He oversees an outreach, technical assistance, and capacity building program focused on Internet tools (including Web Soil Survey) that can be used for planning, conservation, and environmental protection. He has studied Pheasant Branch Conservancy for the past 15 years.

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Adam C. Mednick, AICP, is a Senior Natural Resources Educator for Wisconsin DNR and a doctoral candidate in the Urban and Regional Planning Department at the University of Wisconsin-Madison. His dual research focus is on the impact of land use change on natural resources and the inter-governmental roles played by state environmental agencies in land use planning. His work at the Wisconsin DNR focuses on the evaluation and promotion of Internet tools (including Web Soil Survey).



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