



Rapid Watershed Assessment Upper Fox River Watershed

Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help landowners and local leaders set priorities and determine the best actions to achieve their goals.

CONTENTS

INTRODUCTION	1
COMMON RESOURCE AREA DESCRIPTION	2
LAND USE AND ANNUAL PRECIPITATION MAPS	4
ASSESSMENT OF WATERS	5
SOILS	7
DRAINAGE CLASSIFICATION	8
FARMLAND CLASSIFICATION	9
HYDRIC SOILS	10
LAND CAPABILITY CLASSIFICATION	11
PRS AND OTHER DATA	12
CENSUS AND SOCIAL DATA (RELEVANT)	13
URBAN POPULATION/POPULATION ETHNICITY	14
RESOURCE CONCERNS/WATERSHED ASSESSMENT	14
ECOLOGICAL LANDSCAPES/WATERSHED PROJECTS, STUDIES, MONITORING	15
PARTNER GROUPS	16
FOOTNOTES/BIBLIOGRAPHY	17

INTRODUCTION ¹

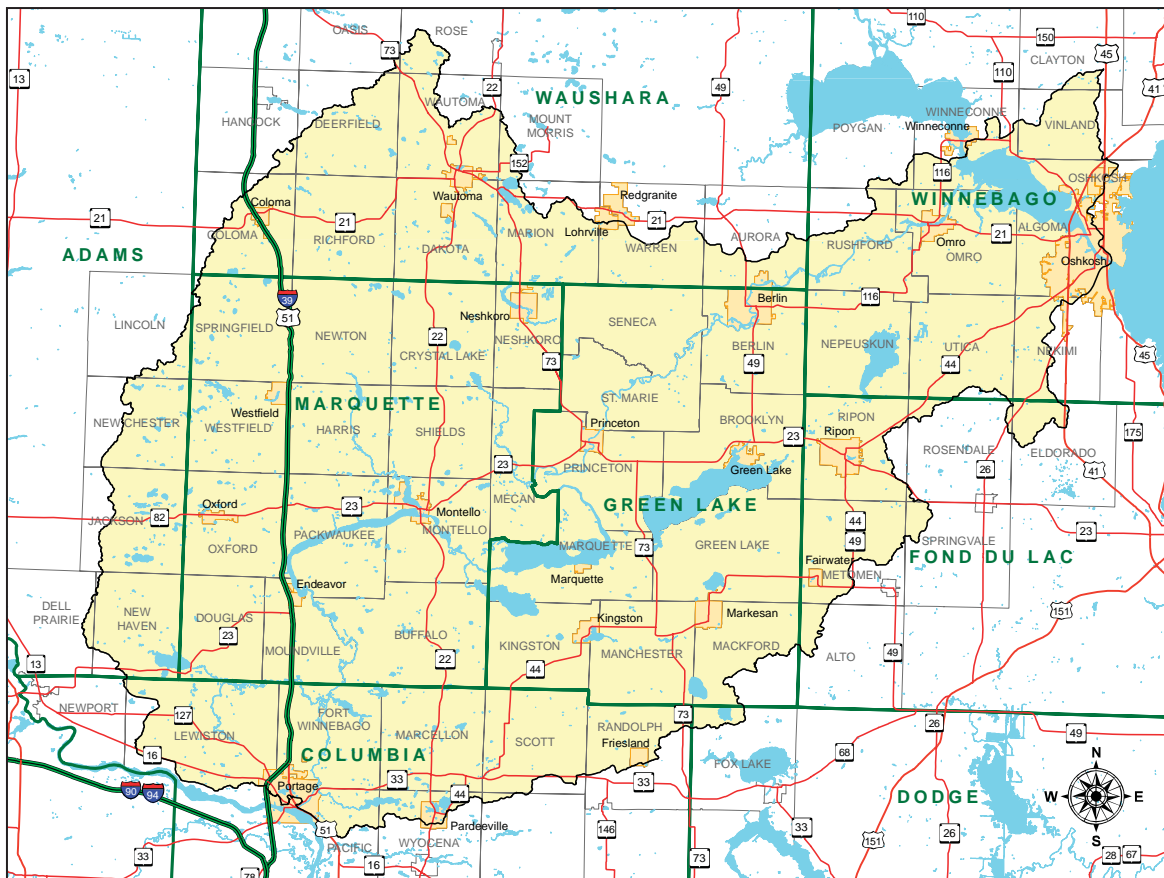


The Upper Fox River Watershed is located in east central Wisconsin and includes all of Marquette County and portions of Adams, Calumet, Columbia, Fond du Lac, Green Lake, Winnebago, and Waushara Counties. The watershed is very diverse in its land use, geomorphology, and biology. All of these aspects are affected by the fast growing communities found in the watershed. Agriculture, urban areas, recreational land, and forests are the major land uses.

The watershed has a significant mileage of high quality streams including 164 miles of cold water trout streams, particularly in Marquette, Waushara, and Adams County portions of the watershed. Many streams and lakes in the watershed depend on groundwater recharge for their water source, making groundwater levels a critical component of the ecosystem.

Numerous lakes in the watershed include hypereutrophic and shallow millponds, mesotrophic kettle lakes, and deep, oligotrophic lakes with warm and cold water fisheries. Green Lake has a trout fishery and is the deepest natural lake in Wisconsin at 236 feet.

The Upper Fox River watershed is relatively rich with wetlands. Aquatic habitat covers nearly a quarter of the basin when surface water and wetland areas are combined. The numerous small wetland complexes, usually next to streams and lakes in the watershed, contribute to the relatively high water quality present in many of the streams in watershed. Some of the larger wetland complexes in the basin are the White-Puchyan wetlands complex in Marquette and Green Lake Counties, Germania Marsh in Marquette County, Grand River Marsh in Green Lake County, and the Rush Lake wetlands in Winnebago County.



ACREAGE IN THE UPPER FOX RIVER WATERSHED



County	County Acres	Acres in HUC	% of HUC from County	% of County in HUC
Marquette	296,858	296,742	29	100
Green Lake	243,218	236,834	23	97
Winnebago	370,345	142,167	14	38
Waushara	407,694	138,646	13	34
Columbia	509,123	119,894	12	24
Adams	440,260	52,592	5	12
Fond du Lac	489,812	47,830	5	10
Dodge	580,266	2,193	0	0



COMMON RESOURCE AREAS

Common Resource Area delineations are defined as a geographical areas where resource concerns, problems and treatment needs are similar. Common Resource areas are a subdivision of an existing Major Land Resource Area (MLRA). Landscape conditions, soil, climate and human considerations are used to determine the boundary of Common Resource Areas.

95A-WI1 Eastern Wisconsin Till Plain

Gently sloping till plain with moderately well drained to somewhat poorly drained loamy and clayey soils, and poorly drained organic soils in the depressions. Lake Winnebago and Lake Michigan shorelines and significant wetland complexes are included. Cropland is the major land use with some large dairy farms, grazing land, and deciduous

MAJOR LAND RESOURCE AREAS ².

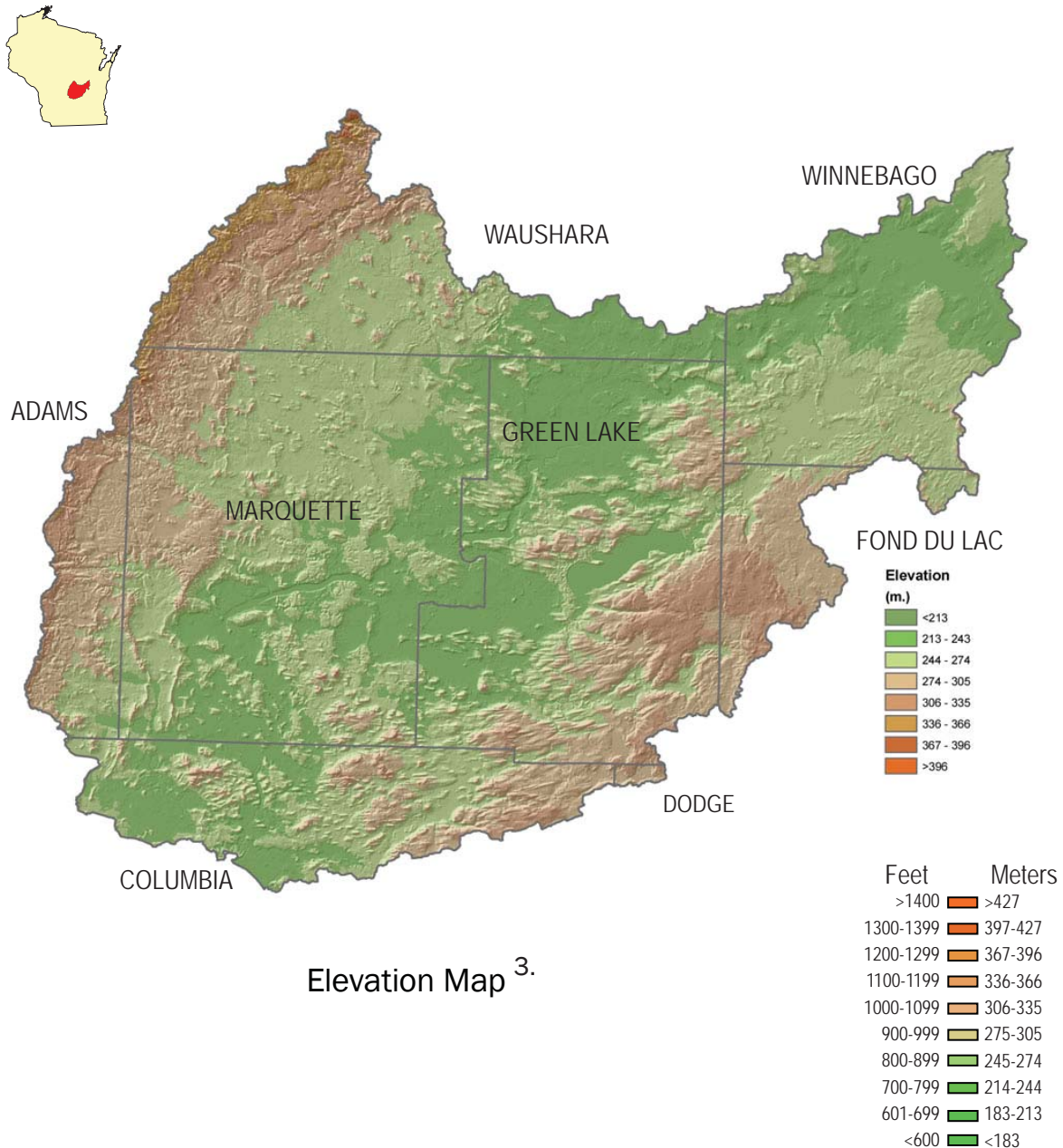
and coniferous forestland. Development pressure is high. Primary resource concerns are cropland and construction site erosion, stormwater management, nutrient management, surface water and ground water quality, and wetland habitat management and restoration.

95B-WI1 Southern Wisconsin and Northern Illinois Till Plain

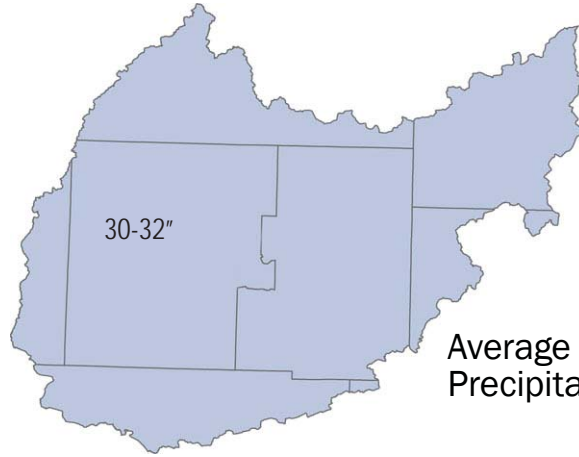
Nearly level to strongly sloping till plain with prominent drumlins. Well drained silty and loamy soils with poorly drained organic soils in the depressions. Mostly cropland with a mix of livestock and cash grain enterprises. Grazing land and scattered deciduous forest, lakes, and marshes are also present. Primary resource concerns include cropland and construction site erosion, surface water quality, storm water management, and wetland habitat protection and restoration.

95B-WI2 Southern Green Bay Lobe Moraine

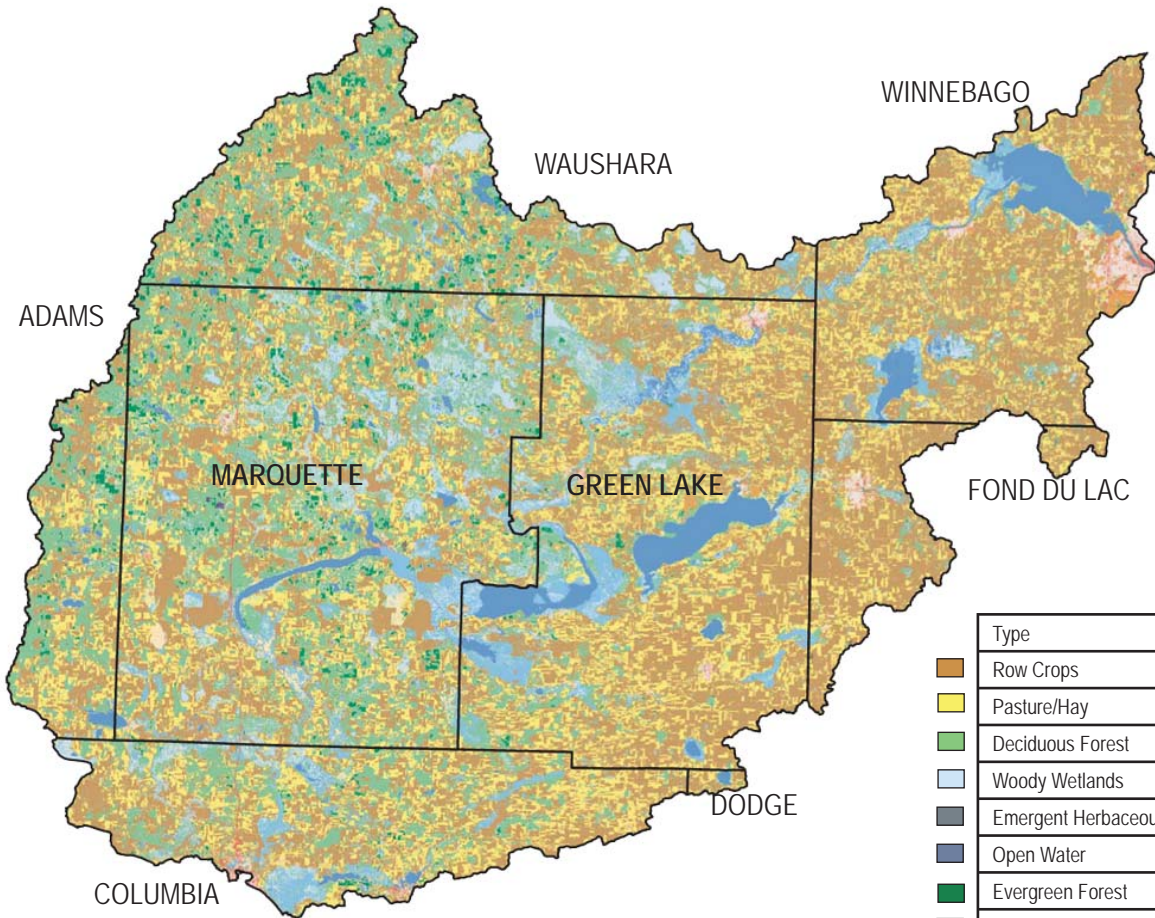
Gently sloping to moderately steep hummocky moraine with scattered swamps. Mostly well drained loamy, clayey, and sandy soils with organic soils in the depressional areas. Major land uses are cash grain cropland and livestock agricultural enterprises, with significant grazing land and deciduous forest. Includes the Wisconsin River valley and eastern Baraboo Hills. Primary resource concerns are cropland soil erosion, surface water quality and wetland habitat protection and restoration.



Elevation Map ³.



Average Annual⁴ Precipitation Map (inches)

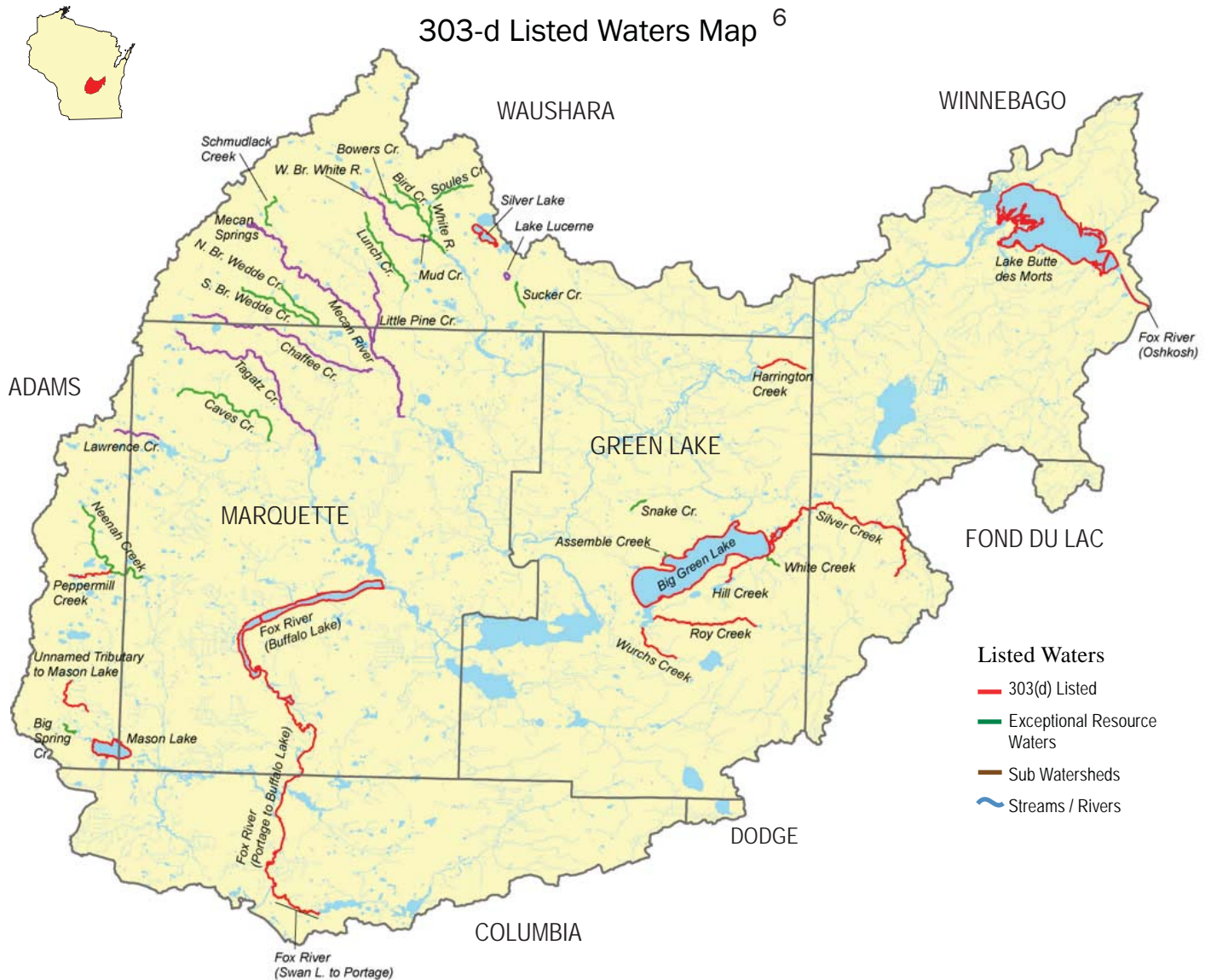


LAND USE/ LAND COVER MAP⁵

Type	Acres	%
Row Crops	409,699	40
Pasture/Hay	222,625	21
Deciduous Forest	196,499	19
Woody Wetlands	47,843	5
Emergent Herbaceous Wetlands	43,212	4
Open Water	42,080	4
Evergreen Forest	25,220	2
Grasslands/Herbaceous	19,971	2
Mixed Forest	11,455	1
Low Intensity Residential	6,679	1
Commercial/Industrial/Transportation	5,034	0
Urban/Recreational Grasses	4,011	0
High Intensity Residential	2,025	0
Small Grains	230	0
Quarries/Strip Mines, Gravel Pits	106	0
Transitional	104	0
Bare Rock/Sand/Clay	59	0
Shrubland	57	0
Orchards/Vineyards	38	0

ASSESSMENT OF WATERS

Section 303(d) of the Clean Water Act states that water bodies that are not meeting their designated uses (fishing, swimming), due to pollutants, must be placed on this list. The 303(d) impaired Waters List is updated every two years. Wisconsin is required to develop TMDLs, Total Maximum Daily Loads, for water bodies on this list. Exceptional Resource Waters (ERW) provide valuable fisheries, hydrologically or geologically unique features, outstanding recreational opportunities, unique environmental settings, and which are not significantly impacted by human activities may be classified as exceptional resource waters. Outstanding Resource waters (ORW) and ERW differ in that ORW do not have an associated point source discharge, where ERWs do.



For information on specific subwatersheds, 303(d) or Exceptional/Outstanding Resource Waters (ERW/ORW):
<http://dnr.wi.gov/org/water/wm/wqs/303d/faqs.html> and <http://dnr.wi.gov/org/gmu/gpsp/gpbasin/>

303(d) Waters ⁷	SEDIMENT	DEGRADED HABITAT	DISSOLVED OXYGEN	AQUATIC TOXICITY	TEMPERATURE	PHOSPHOROUS	MERCURY	PCBS	EUTROPHICATION	PH
Big Green Lake								X		
Fox River (Portage to Buffalo Lake)								X		
Fox River (Swan Lake to Portage)								X		
Fox River (Buffalo Lake)								X		
Fox River (Oshkosh)				X						
Harrington Creek	X	X								
Hill Creek (All)	X	X								
Lake Butte Des Morts	X		X			X	X	X	X	
Mason Lake						X			X	X
Peppermill Creek	X	X			X					
Roy Creek (All)	X	X								
Silver Creek (2)	X	X			X					
Silver Lake (Big, Waushara County)				X						
Unnamed Tributary (to Mason Lake, T14NR7ES25)	X	X								
Wurchs Creek	X	X								
Exceptional Resource Waters										
Assemble Creek										
Big Spring Creek										
Bird Creek										
Bowers Creek										
Caves Creek										
Lunch Creek										
Mud Creek										
Neenah Creek										
N Branch Wedde Creek										
Schmudlack Creek										
Snake Creek										
Soules Creek										
S Branch Wedde Creek										
Sucker Creek										
White Creek										
White River (Main Br)										
Outstanding Resource Waters										
Chaffee Creek										
Lawrence Creek										
Little Pine Creek										
Lake Lucerne										
Mecan River										
Mecan Springs										
Tagatz Creek										
W Branch White River										

SOILS

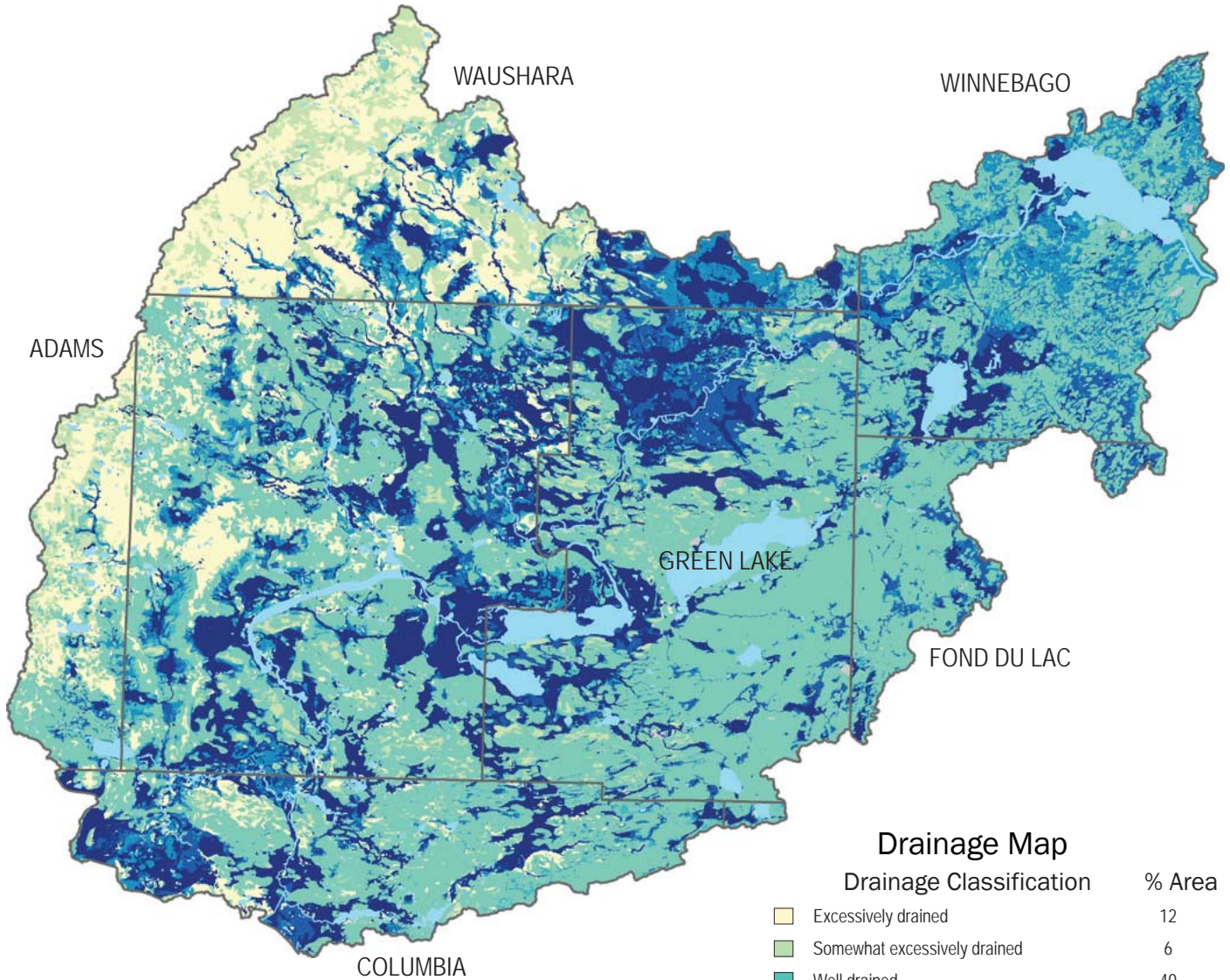
The soils in this watershed vary greatly from east to west and north to south. They formed in calcareous sandy, loamy, and clayey glacial till, outwash and or lake laid sediments called lacustrine material. The sandy and loamy glacial till in the western and central portion of the watershed has a sandy mantle that was deposited over the till. This mantle was left by wind and melt waters from the glaciers. Clayey glacial till can be found in the northeastern part of the watershed. Pitted plains containing think layers of sand and gravelly outwash is also very common throughout this watershed. The silty and clayey lacustrine soils are commonly stratified with sandy material.

The initial Soil Survey of Wisconsin was completed in May of 2006. Soil Survey work in Wisconsin began in the early 1900s shortly after the inception of the National Cooperative Soil Survey. Early soil surveys produced were a joint effort between federal and state agencies. During the 1960s, 1970s, and 1980s, soil surveys depended on county cost-share monies and completed work projects varied around the state. Because of this partnership approach and because soil survey methods and concepts have improved over time, incompatibilities exist between counties.

The next phase of the Wisconsin Soil Survey will work to resolve inconsistencies brought on by the county based soil survey approach by implementing the Major Land Resource Area soil survey approach. By typifying soil series and mapunit concepts across similar geographic areas instead of by political boundaries, the inconsistencies between counties that exist now will be resolved. Updated soil survey information will be continually made available and can be obtained through the Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov> for official and current USDA soil information as viewable maps and tables. Visit the Soil Data Mart at <http://soildatamart.usda.gov> to download SSURGO certified soil tabular and spatial data.

DRAINAGE CLASSIFICATION

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the “Soil Survey Manual.”



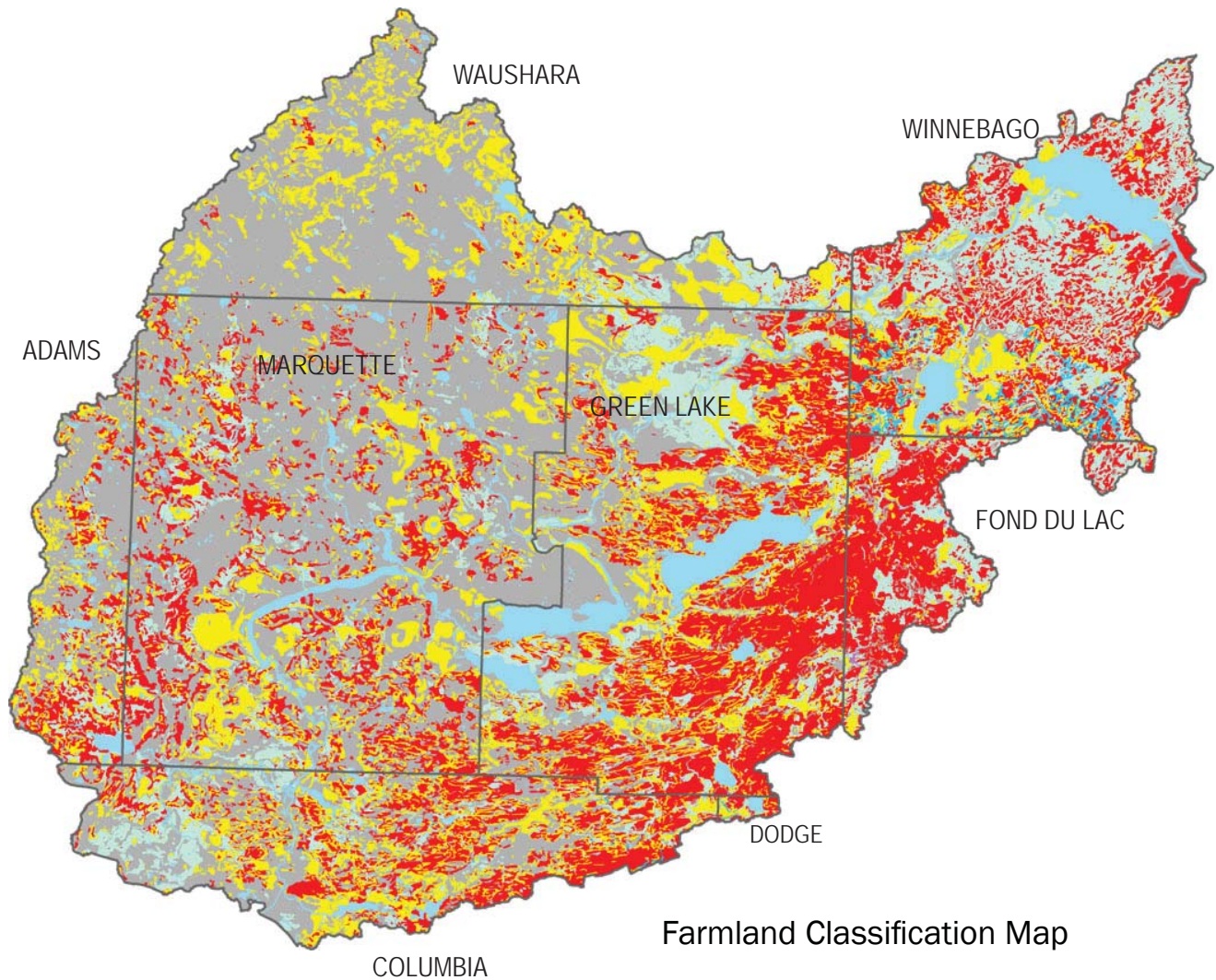
Drainage Map

Drainage Classification	% Area
Excessively drained	12
Somewhat excessively drained	6
Well drained	40
Moderately well drained	4
Somewhat poorly drained	8
Poorly drained	9
Very poorly drained	17
Water	5

Some inconsistencies occur at county lines. This is a result of the county oriented soil survey approach. The Wisconsin NRCS Soil Survey is continually improving upon the initial Soil Survey and current official Soil Survey information can be found at Soil Data Mart and Web Soil Survey






FARMLAND CLASSIFICATION

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the Federal Register, Vol. 43, No 21, January 31, 1978.



Farmland Classification Map

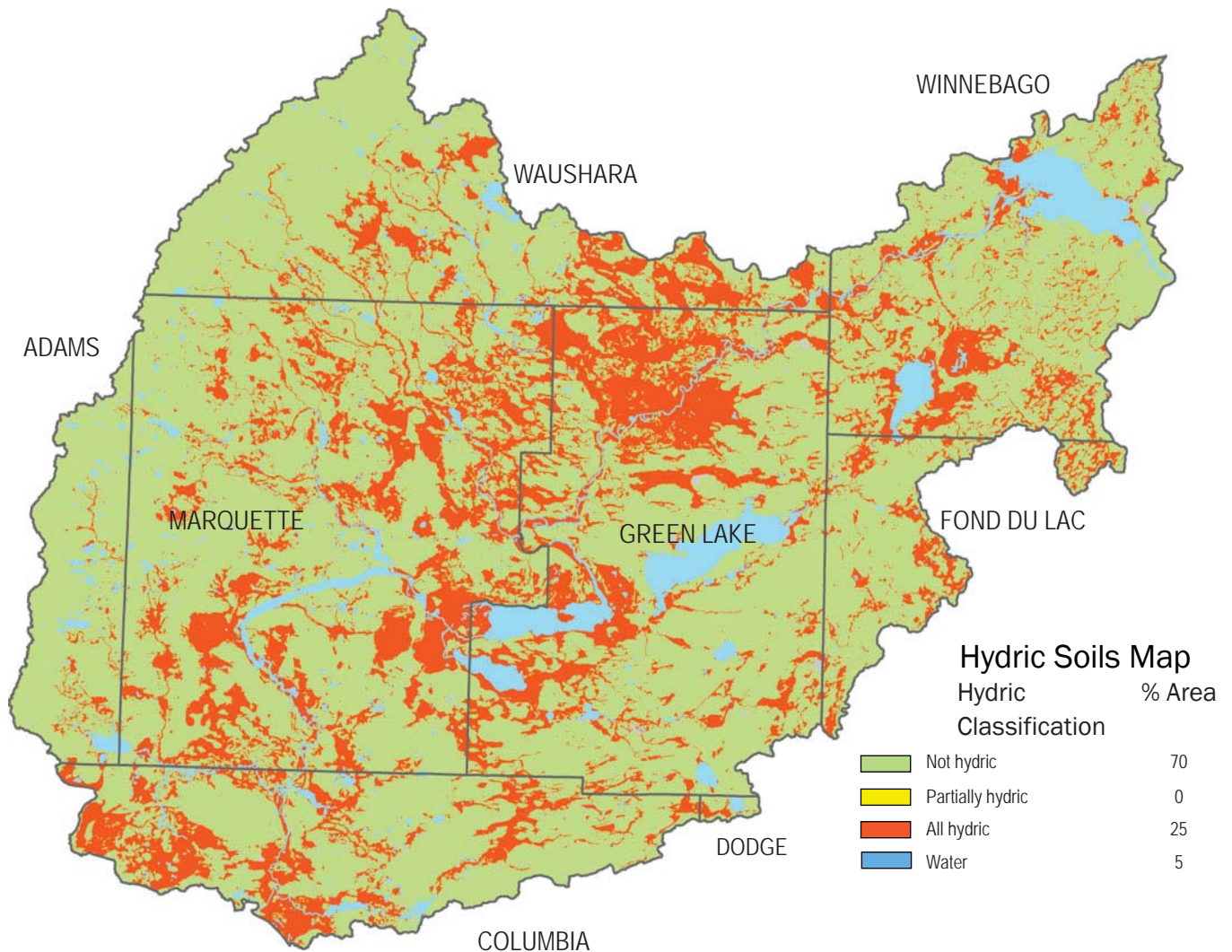
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	Percent
 All areas are prime farmland	26
 Farmland of statewide importance	19
 Prime farmland if drained	12
 Not Prime farmland	43
 Water	

HYDRIC SOILS

This rating provides an indication of the proportion of the map unit that meets criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions of non-hydric soils in the higher positions on the landform, and map units dominantly made up of non-hydric soils may have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation. If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make on site determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 2002).



LAND CAPABILITY CLASSIFICATION

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.



Land Capability Map

Land Capability Classification	% Area
Well Suited	28
Moderately well suited	47
Poorly suited	19
Unsuited	5
Water	

Some inconsistencies occur at county lines. This is a result of the county oriented soil survey approach. The Wisconsin NRCS Soil Survey is continually improving upon the initial Soil Survey and current official Soil Survey information can be found at Soil Data Mart and Web Soil Survey

PRS AND OTHER DATA

The following table is a product of the NRCS Performance Results System (PRS) and reflects progress made over the past several years on several key areas of conservation. The PRS provides support for reporting the development and delivery of conservation programs, analyzing and reporting progress, and management applications by NRCS and conservation partners. The public can generate additional reports by visiting the following link: <http://ias.sc.egov.usda.gov/prsreport2006/>

PRS PERFORMANCE MEASURES ⁸

	FY99	FY00	FY01	FY02	FY03	FY04	FY05	TOTAL
TOTAL CONSERVATION SYSTEMS PLANNED (ACRES)	6,478	25,483	26,121	29,371	11,507	N/A	25,658	124,618
TOTAL CONSERVATION SYSTEMS APPLIED (ACRES)	5,158	23,386	25,465	29,371	11,934	N/A	21,853	117,167
CONSERVATION PRACTICES								
TOTAL WASTE MANAGEMENT (313) (NUMBERS)	2	12	4	2	3	1	1	25
RIPARIAN FOREST BUFFERS (391) (ACRES)	0	0	26	50	16	0	11	103
EROSION CONTROL TOTAL SOIL SAVED (TONS/ YEAR)	4,994	160,612	35,140	29,288	19,071	N/A	N/A	249,105
TOTAL NUTRIENT MANAGEMENT (590) (ACRES)	637	7,047	10,994	17,770	2,527	5,113	7,579	51,667
PEST MANAGEMENT SYSTEMS APPLIED (595A) (ACRES)	0	0	546	0	0	0	630	1,176
PRESCRIBED GRAZING 528A (ACRES)	0	0	814	768	286	900	1,271	4,039
TREE & SHRUB ESTABLISHMENT (612) (ACRES)	159	815	1,151	343	167	379	62	3,076
RESIDUE MANAGEMENT (329A-C) (ACRES)	1,469	6,632	15,245	7,828	2,873	4,054	11,559	49,660
TOTAL WILDLIFE HABITAT (644 - 645) (ACRES)	4,273	9,514	7,017	3,134	3,034	1,135	1,749	29,856
TOTAL WETLANDS CREATED, RESTORED, OR ENHANCED (ACRES)	765	3,327	1,475	3,046	1,732	631	1,434	12,410
ACRES ENROLLED IN FARMBILL PROGRAMS								
CONSERVATION RESERVE PROGRAM	3,865	9,624	5,978	1,884	1,574	N/A	409	23,334
WETLANDS RESERVE PROGRAM	362	1,968	424	1,081	556	N/A	2,431	6,822
ENVIRONMENTAL QUALITY INCENTIVES PROGRAM	671	5,973	1,402	2,967	6,181	N/A	11,831	29,025
WILDLIFE HABITAT INCENTIVE PROGRAM	0	45	0	0	31	N/A	5	81
FARMLAND PROTECTION PROGRAM	0	0	0	80	0	N/A	136	216

CENSUS AND SOCIAL DATA (RELEVANT)⁹

There are 2,465 farms in the watershed, covering a total of 552,312 acres. Average farm size in the watershed is 224 acres compared to a statewide average of 201 acres in Wisconsin. Please refer to the tables below for more detailed information or visit the web site of the Wisconsin Office of the National Agricultural Statistics Service at: http://www.nass.usda.gov/Statistics_by_State/Wisconsin/index.asp

	2002 AG CENSUS DATA	ADAMS	COLUMBIA	DODGE	FOND DU LAC	GREEN LAKE	MAR-QUETTE	WAUSH-ARA	WIN-NEBAGO	TOTAL
	FARMS (NUMBER)	49	359	8	160	653	623	244	370	2,465
	LAND IN FARMS (ACRES)	14,701	81,867	1,616	33,740	144,070	145,406	65,476	65,435	552,312
	TOTAL CROPLAND (ACRES)	10,822	62,174	1,363	28,641	113,436	92,497	46,504	52,897	408,334
	IRRIGATED LAND (ACRES)	5,243	367	2	77	2,480	4,704	16,632	79	29,583
	PRINCIPAL OPERATOR BY PRIMARY OCCUPATION - FARMING (NUMBER)	29	218	5	107	421	330	143	224	1,477
FARMS BY SIZE	FARMS BY SIZE - 1 TO 10 ACRES	1	26	1	10	31	26	12	23	131
	FARMS BY SIZE - 11 TO 49 ACRES	11	78	2	33	119	135	58	98	533
	FARMS BY SIZE - 50 TO 179 ACRES	19	132	3	58	271	247	83	152	964
	FARMS BY SIZE - 180 TO 499 ACRES	12	82	2	44	169	150	65	68	592
	FARMS BY SIZE - 500 TO 999 ACRES	3	25	0	9	39	45	14	20	156
	FARMS BY SIZE - 1,000 ACRES OR MORE	3	15	0	5	23	21	12	10	89
LIVESTOCK AND POULTRY	LIVESTOCK AND POULTRY - CATTLE AND CALVES INVENTORY (FARMS)	17	148	4	74	270	235	83	124	953
	LIVESTOCK AND POULTRY - CATTLE AND CALVES INVENTORY - BEEF COWS (FARMS)	9	53	1	11	49	107	28	29	286
	LIVESTOCK AND POULTRY - CATTLE AND CALVES INVENTORY - MILK COWS (FARMS)	3	50	2	44	131	71	32	56	387
	LIVESTOCK AND POULTRY - HOGS AND PIGS INVENTORY (FARMS)	3	19	0	5	25	25	13	10	100
	LIVESTOCK AND POULTRY - SHEEP AND LAMBS INVENTORY (FARMS)	1	21	0	4	21	14	9	7	77
	LIVESTOCK AND POULTRY - LAYERS 20 WEEKS OLD AND OLDER INVENTORY (FARMS)	4	18	0	5	46	33	21	12	139
	LIVESTOCK AND POULTRY - BROILERS AND OTHER MEAT-TYPE CHICKENS SOLD (FARMS)	2	8	0	1	8	13	6	5	43
SELECTED CROPS HARVESTED	SELECTED CROPS HARVESTED - CORN FOR GRAIN (ACRES)	2,091	28,402	514	8,508	44,008	26,361	8,865	14,635	133,383
	SELECTED CROPS HARVESTED - CORN FOR SILAGE OR GREENCHOP (ACRES)	174	2,316	94	2,132	5,060	4,378	1,641	3,252	19,047
	SELECTED CROPS HARVESTED - WHEAT FOR GRAIN, ALL (ACRES)	112	1,482	39	1,217	3,263	720	394	2,922	10,149
	SELECTED CROPS HARVESTED - WHEAT FOR GRAIN, ALL - WINTER WHEAT FOR GRAIN (ACRES)	75	1,466	38	0	3,158	0	394	0	5,130
	SELECTED CROPS HARVESTED - WHEAT FOR GRAIN, ALL - SPRING WHEAT FOR GRAIN (ACRES)	37	16	1	0	105	0	0	0	159
	SELECTED CROPS HARVESTED - OATS FOR GRAIN (ACRES)	179	773	24	608	1,764	1,426	330	745	5,849
	SELECTED CROPS HARVESTED - BARLEY FOR GRAIN (ACRES)	0	41	2	79	119	0	40	7	289
	SELECTED CROPS HARVESTED - SOYBEANS FOR BEANS (ACRES)	1,553	12,152	266	4,687	16,205	11,954	4,541	12,361	63,719
	SELECTED CROPS HARVESTED - FORAGE - LAND USED FOR ALL HAY AND ALL HAYLAGE, GRASS SILAGE, AND GREENCHOP (SEE TEXT) (ACRES)	1,333	9,837	277	6,937	17,289	21,452	6,810	10,423	74,357
	SELECTED CROPS HARVESTED - VEGETABLES HARVESTED FOR SALE (SEE TEXT) (ACRES)	2,724	1,052	45	1,674	9,756	1,877	10,196	369	27,693
	SELECTED CROPS HARVESTED - LAND IN ORCHARDS (ACRES)	1	10	1	10	24	5	7	22	79

URBAN POPULATION 11

NAME	1990	2000	2004	MEDIAN INCOME*
BERLIN	5,371	5,305	5,213	36,896
COLOMA	383	461	469	33,295
ENDEAVOR	316	440	471	44,063
FAIRWATER	302	350	356	42,292
FRIESLAND	271	298	297	42,500
GREEN LAKE	1,064	1,100	1,125	35,435
KINGSTON	346	288	293	36,250
LOHRVILLE	368	408	412	34,479
MARKESAN	1,496	1,396	1,349	38,472
MARQUETTE	182	169	168	36,667
MONTELLO	1,329	1,397	1,483	32,500
NESHKORO	384	453	448	39,167
OMRO	2,836	3,177	3,282	45,208
OSHKOSH	55,006	62,916	63,485	37,636
OXFORD	499	536	549	35,481
PARDEEVILLE	1,630	1,982	2,125	40,139
PORTAGE	8,640	9,728	10,035	35,815
PRINCETON	1,458	1,504	1,463	32,679
REDGRANITE	1,009	1,040	2,243	26,726
RIPON	7,241	6,828	7,268	37,399
WAUTOMA	1,784	1,998	2,103	31,723
WESTFIELD	1,125	1,217	1,211	30,341
WINNECONNE	2,059	2,401	2,445	44,886

POPULATION ETHNICITY 10

Total Population = 124,181
 Urban population = 62,671
 Rural Population = 61,505
 White alone = 118,583
 Hispanic or Latino = 2,759
 Two or more races = 1,092
 Black or African American alone = 1,904
 Some other race alone = 830
 American Indian and Alaska Native alone = 526
 Asian Alone = 1,213
 Native Hawaiian and Other Pacific Islander alone = 33

RESOURCE CONCERNS

Primary resource concerns from agriculture include cropland erosion leading to sediment and nutrient losses to surface waters. Barnyard runoff contributes pathogens, nutrients, and sediment to water bodies. Nitrate and pesticide levels in groundwater are also concerns related to agriculture.

Urban development, construction site erosion, and streambank and shoreline erosion are the major non-agriculture resource concerns. Aging dams on watershed streams and rivers impair fish movement and in some cases result in impoundments with poor water and habitat quality. A large percentage of original wetlands and grasslands have been converted for development and agriculture. Invasive species in uplands, remaining

WATERSHED ASSESSMENT

To assess a watershed's agricultural nonpoint pollution potential, a model was used to generate a watershed assessment score relative to other 8-digit watersheds in Wisconsin. Factors used in the model include acres of cropland, acres of highly erodible land (HEL), and the number of animal units in the watershed. Scores ranged from 0.0 (lowest conservation need) to 24.2 (highest conservation need). The scores may be useful in determining funding allocations on a watershed basis for agricultural nonpoint pollution control initiatives. The model does not attempt to measure pollution levels and does not reflect pollution potential from point sources of pollution or other nonpoint pollution sources beyond the above criteria.

The watershed assessment score for the Upper Fox River Watershed 11.2.

ECOLOGICAL LANDSCAPES



Southeast Glacial Plains -General Description

The Southeast Glacial Plains Ecological Landscape makes up the bulk of the non-coastal land area in southeast Wisconsin. This Ecological Landscape is made up of glacial till plains and moraines. Most of this Ecological Landscape is composed of glacial materials deposited during the Wisconsin Ice Age, but the southwest portion consists of older, pre-Wisconsin till with a more dissected topography. Soils are lime-rich tills overlain in most areas by a silt-loam loess cap. Agricultural and residential interests throughout the landscape have significantly altered the historical vegetation. Most of the rare natural communities that remain are associated with large moraines or in areas where the Niagara Escarpment occurs close to the surface.

Central Sand Hills - General Description

The Central Sand Hills Ecological Landscape is located in central Wisconsin at the eastern edge of what was once Glacial Lake Wisconsin. The landforms in this Ecological Landscape are a series of glacial moraines that were later partially covered by glacial outwash. The area is characterized by a mixture of farmland, woodlots, wetlands, small kettle lakes, and cold water streams, all on sandy soils. The mosaic of glacial moraine and pitted outwash throughout this Ecological Landscape has given rise to extensive wetlands in the outwash areas, and the headwaters of coldwater streams that originate in glacial moraines. The growing season is long enough for agriculture but the sandy soils limit agricultural productivity somewhat.

WATERSHED PROJECTS, STUDIES, MONITORING, ETC

The Discovery Farms program conducts monitoring and research on working farms around Wisconsin to determine the environmental and economic impacts of best management conservation practices. A management-intensive dairy grazing operation located in the Upper Fox River watershed (Columbia County) is a Core Discovery Farm.

Two Wisconsin Priority Watershed Projects, Big Green Lake and Neenah Creek, have been completed in the Upper Fox River Watershed. These projects provided technical assistance and cost-sharing for the installation of best management conservation practices.

The Wisconsin Department of Natural Resources conducts ongoing, baseline water quality monitoring in many streams and lakes within the watershed each year.

PARTNER GROUPS

- County Land Conservation Departments (Directory Link)
http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/pdf/ar-pub-119web_dec2005.pdf
- Discovery Farms <http://www.uwdiscoveryfarms.org/index.htm>
- Green Lake Association www.greenlakeassociation.com
- Lake Puckaway Protection and Rehabilitation District www.lakepuckaway.com
- River Alliance <http://www.wisconsinrivers.org/>
- Trout Unlimited
 Central WI Chapter <http://www.cwtu.org/>
 Aldo Leopold Chapter <http://www.alctu.com/>
- USDA Farm Service Agency <http://www.fsa.usda.gov/wi/news/default.asp>
- US Fish and Wildlife Service <http://www.fws.gov/midwest/maps/wisconsin.htm>
- UW Cooperative Extension <http://www.uwex.edu/ces/> and <http://basineducation.uwex.edu/foxwolf>
- Wisconsin Department of Agriculture, Trade, and Consumer Protection <http://www.datcp.state.wi.us>
- Wisconsin Department of Natural Resources <http://dnr.wi.gov/>

FOOTNOTES/BIBLIOGRAPHY

All data is provided “as is.” There are no warranties, express or implied, including the warranty of fitness for a particular purpose, accompanying this document. Use for general planning purposes only.

1. Introduction and the description of resource concerns were derived from a report issued by the Wisconsin Department of Natural Resources titled “The State of the Basin Reports”, 4/12, WDNR.
2. Common Resource Area (CRA) Map delineations are defined as geographical areas where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a Common Resource Area.
Online linkage: <http://soils.usda.gov/survey/geography/cra.html>.
3. The relief map was created using the National Elevation Dataset (NED) 1 arc second, approximately 30 meters, digital elevation model (DEM) raster product assembled by the U.S. Geological Survey (USGS). A hillshade grid was derived from the 30m DEM and draped over the DEM to symbolize the map and create a 3-D effect. The data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>.
For more information about NED visit <http://ned.usgs.gov/>.
4. Average Annual Precipitation data was originated by Chris Daly of Oregon State University and George Taylor of the Oregon Climate Service at Oregon State University and published by the Water and Climate Center of the Natural Resources Conservation Service in 1998. Annual precipitation data was derived from the climatological period of 1961-1990. Parameter-elevation Regressions on Independent Slopes Model (PRISM) derived raster data is the underlying data set from which the polygons and vectors were created. For more information about PRISM visit http://www.ocs.orst.edu/prism/prism_new.html. Precipitation data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>.
5. The Land Use/Land Cover data was generated from the National Land Cover Dataset (NLCD) compiled from Landsat satellite TM imagery (circa 1992) with a spatial resolution of 30 meters and supplemented by various ancillary data (where available). The data was assembled by the USGS and published in June of 1999. The analysis and interpretation of the satellite imagery was conducted using very large, sometimes multi-state image mosaics. For more information about NLCD visit <http://edcwww.cr.usgs.gov/programs/lccp/nationallandcover.html>. The data was downloaded from the NRCS Geospatial Data Gateway <http://datagateway.nrcs.usda.gov/>.
6. 303(d) listed streams were derived from the Water Quality Standards Section of the Wisconsin Department of Natural Resources (WDNR) website: [http://dnr.wi.gov/org/water/wm/wqs/303d/Lists303d/Approved_2004_303\(d\)_list.pdf](http://dnr.wi.gov/org/water/wm/wqs/303d/Lists303d/Approved_2004_303(d)_list.pdf). For more information about the individual sub-watersheds visit <http://dnr.wi.gov/org/gmu/gpsp/gpbasin/index.htm>. For a list and explanation of Outstanding and Exceptional Resource Waters visit: <http://dnr.wi.gov/org/water/wm/wqs/orwerw/>.

7. Soil Survey Geographic Database (SSURGO) tabular and spatial data were downloaded for the following surveys:

Adams Co., WI (WI019) Published 2006 10 20
Columbia Co., WI (WI021) Published 2006 01 23
Dodge Co, WI (WI027) Published 2006 03 03
Fond du Lac Co., WI (WI039) Published 2006 01 20
Green Lake Co., WI (WI047) Published 2006 03 03
Marquette Co., WI (WI077) Published 2006 03 03
Waushara Co., WI (WI137) Published 2006 01 20
Winnebago Co., WI (WI120) Published 2006 01 20

Metadata and SSURGO data for the aforementioned surveys were downloaded from the NRCS Soil Data Mart at <http://soildatamart.nrcs.usda.gov>. Component and layer tables from the tabular data were linked to the spatial data to derive the soil classifications found in this section. Visit the online Web Soil Survey at <http://websoilsurvey.nrcs.usda.gov> for official and current USDA soil information as viewable maps and tables.

8. Performance Results System (PRS) data was extracted from the PRS homepage by year, conservation systems and practices and Hydrologic Unit Code (HUC) level. HUC level reporting was not available where N/A is listed. For more information on these and other performance reports visit <http://ias.sc.egov.usda.gov/prshome/>.

9. Ag Census data were downloaded from the National Agricultural Statistics Service (NASS) Website and the data were adjusted by percent of HUC in the county. For more information on individual census queries visit the NASS website at <http://www.nass.usda.gov/>.

10. Population ethnicity data were extracted from the Census 2000 Summary File 3 compiled by the U.S. Census Bureau. The data were adjusted by Block Group percentage in the HUC. Population items were selected from the SF30001 table. For more information on census data and definitions visit <http://www.census.gov/Press-Release/www/2002/sumfile3.html>.

11. Urban population and median household income data were derived from the American FactFinder assembled by the U.S. Census Bureau. American FactFinder is a quick source for population, housing, income and geographic data. For other census items and trends visit http://factfinder.census.gov/home/saff/main.html?_lan